Paper on fibres — Cross-disciplinary approaches to the conservation of fibre based objects

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ABSTRACT

In preparation for an exhibition of objects from the highlands of Papua New Guinea, a number of organic based objects were analysed using visual and scientific examination in order to discern what materials had been used to construct them and how best to treat the objects. Conservation methods commonly employed in paper conservation were found to be particularly effective in treatment, being both sympathetic to the materials and easily reversible. These involved the repair of broken natural fibre elements in woven constructions, seed and shell necklaces, the strengthening of bark cloth, the cleaning and repair of feathers and quills and the consolidation of powdery matte paint surfaces. In treating Indigenous materials some ethical dilemmas were encountered such as the removal of dirt layers present and also previous repairs to some of the objects.

Keywords Papua New Guinea fibre art, conservation, fibre, Japanese paper repairs

INTRODUCTION

Preparation for the *Plumes and Pearlshells* exhibition at the Art Gallery of New South Wales (AGNSW) involved the treatment and exhibition mounting of a large number of indigenous objects from the Papua New Guinea Highlands. The objects within this collection were mainly constructed of organic materials and had remained in storage since their acquisition in the 1970s. Considering the age of many objects it was remarkable they had survived so well, however many needed extensive conservation treatments before they could be safely and ethically displayed. The conservation approaches to the treatment of indigenous materials is often one of minimal intervention with a particular emphasis on reversibility. As treatment pathways were developed, the object conservators involved with the project turned to some techniques commonly used in paper conservation, finding these methods satisfied the criteria of minimal intervention and reversibility. While the use of paper conservation techniques in other specializations is not a new idea, the success of this interdisciplinary approach demonstrates how the open sharing of knowledge within the profession can lead to new applications of existing techniques.

BACKGROUND

The large collection of Papua New Guinea Highlands material was donated to the gallery by Sydney businessman Stanley Gordon Moriarty, who acquired the objects during his travels to PNG from 1961 to 1972 (Art Gallery of New South Wales, 2013). These materials were usually found locally or acquired through trade with other communities. Many of the artworks display a high level of ingenuity with sophisticated material properties and manufacturing techniques (Figure 1). Raw bush materials have been transformed into fine items of personal adornment, weaponry or ceremonial objects. Moriarty donated some 540 objects to the AGNSW, with the upcoming exhibition showcasing a selection of the finest pieces. Many of the objects are constructed of organic materials from the area such as plant and wood fibres, lichens, seeds, gourds, feathers, fur,

Figure 1. Tairora People, Kainantu or Obura District, Eastern Highlands. Decorated male figure, mid 1900s. Art Gallery of New South Wales.

tusks, bones and shells. The artists' also incorporated materials introduced after western contact in the area such as broken shards of mirror, mop heads, plastic remnants, cloth bandages, synthetic pigments and even discarded soft drink cans.

The issue with many of the objects within the collection is that their organic supports are inherently vulnerable to most forms of damage whether they be chemical, mechanical, environmental or through insects and rodents. For example fibrous materials become dehydrated and brittle and light damage can result in structural weakness and fading of organic dyes.

The conservation of such 'perishable artifacts' is especially problematic as they have often undergone drastic dimensional changes, as a result of environmental fluctuations, resulting in cracking and movement of the support layers and subsequent paint layers (Florian, Kronkright, & Norton 1990, p. 11). Previous mould growth during periods of high humidity has caused staining and structural weakness of affected fibres.

ETHICAL CONSIDERATIONS

The sensitivities surrounding indigenous objects call for a considered approach to their conservation. The concepts of 'minimal intervention' and reversibility are routinely adopted in such treatments and the conservation of the material for the *Plumes and Pearlshells* exhibition was no exception. All treatments were intended to stabilise the objects, ensuring their safety on display, and increase longevity. The intention was not to restore or alter the object in a perceivable way (Munos-Vinas 2009, p. 53). Generally, a 'restoration' treatment to return a work of art to its original condition is not undertaken without consultation with, and agreement from, the relevant indigenous communities. In the treatment of organic materials there can be limited knowledge of how the materials used in conservation such as solvents, adhesives or consolidants will affect the object, and damage or alteration can unintentionally occur. For this reason, it is preferable to use mechanical means of intervention rather than chemical or adhesive as it generally involves less permanent alteration to the object fabric (Norton 1990, p. 196).

Minimal intervention is a subjective notion, as 'no intervention can be absolutely minimal and still be an intervention' (Munoz-Vinas, 2009, p49). Within conservation it is understood that 'minimal intervention' refers to any modifications to the object that could modify it's perceived meaning, whether it be, social, ideological, aesthetic or scientific. It is the principle of 'minimal loss of potential meanings' (Munoz-Vinas 2009, p. 55). In the case of *Plumes and Pearlshells* it meant some treatments were modest in approach, with objects cleaned less than they could have been and some broken elements left untouched. In considering this approach, it was also acknowledged that intervening can play a role in preventing further damage by making an object more structurally sound, for example mending broken weave can protect the exposed elements from further loss (Norton 1990, p 195).

Reversibility is a simple concept in theory, but can be more ambiguous in practice. While introducing an adhesive that can be removed with water is considered reversible, applying such an adhesive as a consolidant cannot realistically be removed without also removing a considerable portion of the surface media. Using Japanese tissue and wheat starch paste to repair breaks is a method commonly employed in paper conservation and is a technique that can realistically be reversed. This technique was utilized with success for the repair of broken elements and also for providing structural strength to weakened areas within numerous objects for exhibition (e.g. loss to feather barbules).

METHODOLOGY

Treatment was required for a number of intricately woven and constructed objects made from plant materials. Some of these objects incorporated several different plant varieties to create decorative patterns and designs. These organic materials had suffered since their construction, through the combined effects of mechanical stresses of original use, poor storage and handling methods, light, chemical and biological degradation.

To repair broken or weak elements Japanese tissue and wheat starch paste were utilized. The materials were sympathetic to the objects, easily adapted to a variety of issues, required minimal intervention and were easily reversible. They were found to be particularly useful in the repair of broken string elements and reintroducing broken sections of weaving back into the main structure of the object (Florian, Kronkright & Norton 1990, pp. 287-292).

A Cowrie shell necklace chosen for exhibition had numerous breakages in the plied plant fibre string. The breakages threatened loss and further damage if the object was to be displayed without treatment, with further stress on the intact string. Where two broken ends were clearly visible, the parts were reconnected with sections of tinted Japanese kozo or gampi paper of suitable weights to match the thickness of the fibre (Figure 2). A short length of paper was twisted in the middle to mimic the plied appearance of the string with the two ends left fanning out (e.g. butterfly shape). These open sections were adhered around the broken string ends with wheat starch paste and the central twisted section acted as a bridge over the gap, giving the appearance and strength of an intact length of string (Figure 3). Some broken sections of string did not have corresponding lengths to which they were originally joined. In these cases, tabs of Japanese tissue were made and attached to the break end with wheat starch paste, before being threaded into the plaited areas of string.

Figure 2. Japanese tissue repair of Cowrie shell necklace, Willet, L. 2013.

Broken basketry, often constructed of rattan, was repaired using a similar method with Japanese paper and wheat starch paste. Where the ends of rattan weaving were broken and protruding outwards, there was the risk of further unraveling of the weave, or damage through general handling. Weaving found to be stiff was first relaxed with a local humidification using dampened blotter and SympaTex® membrane cloth[1]. Once the rattan was more pliable, tabs of Japanese tissue were attached, as with the broken string elements, and threaded back into the weaving, held in place with a further application of wheat starch paste. Where possible the repaired areas were isolated and then held under gentle pressure with either light weights, padded mini clamps or small pieces of Parafilm® M

Figure 3. Japanese tissue repair of Cowrie shell necklace, Willet, L. 2013

(a laboratory film). Parafilm® M is a mouldable and flexible film often used to seal containers (Structure Probe Inc, 2013). It was found to be particularly useful in holding repairs in place as the wheat starch paste dried. When stretched over the repairs the film would grip the object and stay in place with only a light pressure that posed no risk to vulnerable areas. This film was used with success on round objects, such as arrow shafts, where the film could be wound around the object.

Tinted Japanese tissue was also utilized as a means of disguising losses and obvious breakages. One of the key pieces within the exhibition was a large scale carved wooden sculpture with black media on the surface. The feet of the sculpture had sustained large cracks and losses in the wooden support. Previous repairs to the feet in the form of very large iron nails had also contributed to further splitting of the wood fibres. Unfortunately the broken areas of wood were not retained, and therefore could not be reconnected. This left a large area of exposed wood, which contrasted (drastically) with the black surface of the surrounding areas of the object. As this break area was visually distracting, the treatment pathway identified by the curator was that it should be toned down. In-painting the breakage was not an option, as this would be irreversible. To reduce the visual distraction for the duration of the exhibition, Japanese tissue was tinted with acrylic paint to match the black surface of the object and then adhered to the break with wheat starch paste. The Japanese tissue successfully disguises the break, and can easily be removed after the exhibition if it is deemed to compromise the integrity of the object.

Paper repairs were also successfully used in the repair of a damaged bird's skin that was part of the headdress of *a kund gale* male effigy figure from the Minj District, Jiwaka province of PNG. A section from the yellow /white coloured flank plumes, of the male Lesser Bird-of-Paradise, *Paradisaea minor* in the genus *Paradisaea* was de-fleshed and then wrapped and bound around a short section of pith (parenchyma) like fibres and inserted with a narrow shaft of bamboo. Desiccation of the skin combined with previous insect attack had resulted in shrinkage, distortion and loss to the skin and separation with loss to the pith fibre support. Feathers along the open edge of

Figure 4. Bird skin and feather before treatment, Head, K. 2013

the skin were loosely held and in danger of further loss through movement. Insects had also caused weakening and separation of the quill shafts from the skin (Figure 4).

Repair of the skin was problematic as the structure was three-dimensional with an inner bamboo shaft that could not be removed. As feathers were also attached to the open edge of the skin, movement and access was restricted. The first step in the treatment was relaxation of the open edges of the skin. This was facilitated by gently introducing moisture. Small pieces of lightly dampened blotting paper and silicone paper were slipped between the inner surface of the skin and the bamboo support. The whole feather section was then gently wrapped in a SympaTex® membrane to create a humidity chamber.

The skin was checked regularly and where necessary the blotting paper was re misted with water to facilitate relaxation. When the skin had relaxed, the creases were gently eased out with flattened tipped tweezers and mini spatulas. Repair tabs of gampi fibre paper were prepared. Gampi paper matched the thinness and translucency of the skin to be repaired. The inner fibre support was isolated by inserting a roll of silicone paper through the open end so that it rested under the area to be repaired. One edge of the gampi paper was adhered with wheat starch paste and slipped under the open edge of the skin and pressed together. The outer surfaces were isolated with small pieces of Reemay and then lightly weighted until dry. The paper was bridged across the loss and slipped under the opposite edge and adhered using a similar method. The shaft ends of feathers protruding from the skin follicles were held more firmly by pasting small tabs of Kozo fibre paper over the skin and quill shaft (Figure 5). Toned tabs of translucent Kozo paper and starch paste were also successfully used to repair areas of loss and weakness to feather barbules. The starch paste was kept dry to avoid transfer onto the front surfaces of the barbules.

Figure 5. Bird skin and feather after treatment, Head, K. 2013

Many of the objects were painted with what appeared to be natural ochre pigments. These pigments were largely powdery, very friable and in need of consolidation prior to exhibition. The matte appearance of the pigments proved difficult to treat as the majority of the adhesives tested caused severe and obvious staining, possibly due to the solubilisation of underlying degradation products. Again, the materials commonly used in paper conservation were considered for consolidants and found to be more effective than those often utilised in objects conservation (Cummings & Grantham 2002, p. 201). The painted media on many objects was very easily disturbed with minor mechanical intervention, posing an ethical issue of how to remove the surface dirt without also losing pigment. After taking into account the concept of minimal intervention, it was decided that any attempt at mechanical removal of the surface dirt such as brush vacuuming, posed great risk to the pigmented areas through loss or disruption of the media. As a result, it was decided that the dust would also be consolidated in an effort to stabilise the decorative media. According to the literature on the making of such objects, it is believed that very little binder was added directly to the pigment mixtures. Instead, a resin was used, obtained by rubbing the leaves of *Urticaceae* (nettles) or *Moraceae* (mulberry and fig) onto some wooden objects surfaces before the pigments were applied (Hill 2001). As the friability of the materials resembled that of pastels, methods used to fix this media on works on paper were considered. Modified cellulose adhesives were tested and water soluble Bermacol E230 FQ (an Ethyl Hydroxy Ethyl Cellulose) was found to be particularly effective, consolidating the material with little change in appearance. The concentration of the adhesive and various delivery methods were also trialled. The best results were achieved with numerous applications of the diluted consolidant administered as a fine aqueous mist through a nebulizer, an instrument generally used to disperse medicine for inhalation. Customised nozzles were attached to the nebulizer to direct the flow of adhesive and eliminate the risk of drips falling on the media.

Plumes and Pearlshells includes a number of large shields of curved wood with various decorative patterns painted on the front of the objects. Each shield generally had a sling of natural plant materials, usually rattan or cane that is threaded through holes and knotted to secure it. Many of these slings were broken in places, and it was impossible to determine if this was the result of the material failing or if this occurred during the usable life of the object. A battle tactic within the Papua New Guinea Highlands was for the warrior to cut 'with his stone axe at the central knots that hold the shoulder sling and in this way expose the shield-bearer to spears and arrow' (Boylan 2005, p. 142). However the slings were found to be brittle and vulnerable to breakage through dehydration, making it plausible for either scenario to have caused the damage. This presented another ethical issue of whether to repair the broken sling. When broken, the sling may demonstrate to the audience a narrative of battle, while repaired it illustrates the artists' intent at the time of construction. Conservation theory suggests that parts should be repaired 'only if there [is] enough evidence of that previous state to allow for a substantially *faithful-to-facts* restoration' (Munoz-Vinas 2009, p. 142). In this instance, a compromise was made, to repair the broken slings for exhibition with an easily reversible method, once again turning to paper conservation and Japanese tissue repairs. The tissue was first tinted to an appropriate colour with watercolours with the edges feathered to allow the paper to better blend in with the sling material. The broken ends of the sling were positioned back together and wrapped in the Japanese tissue, much like a bandage. For adhesion, a small amount of wheat starch paste was applied with minimal moisture in an effort to avoid stains that may be caused by a more aqueous solution. If at a later date, it is decided that the repair is not appropriate to the object, it can easily be removed by dampening the paper and carefully peeling off the repair.

CONCLUSION

The application of paper conservation techniques in the treatment of objects for *Plumes and Pearlshells* enabled ethical and successful stabilisation of a number of remarkable indigenous objects. The cross-disciplinary approach provided new avenues for treatments that were sympathetic to the vulnerable and deteriorated organic materials. The use of Japanese tissue paper, wheat starch paste and modified cellulose consolidants were methods that interfered minimally with the objects and maintained their integrity. The conservation of these materials has ensured the safety of the objects while on display and into the future, facilitating more access to this extraordinary collection.

ENDNOTES

1. *SympaTex*: The SympaTex membrane is a pore-less copolymer of hydrophilic polyether-ester. Water vapour molecules are transported through the membrane from the inside to the outside by way of an absorption and evaporation process. (SympaTex, 2013, Membrane, SympaTex Technologies, Germany, accessed 2nd of December 2013, <http://www.sympatex. com/en/membrane/225/properties>.

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MATERIALS

Parafilm® M
Laboratory Film.
American National Can™ Chicago, Il .60631.
SPI Supplies/Structure Probe Inc, 206 Garfield Ave, West Chester, PA 19380-4512, spi3spi@2spi.com.

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Bermocoll E230 FQ®
(Ethylhydroxyethyl cellulose MFG)
Akzo Nobel Functional Chemicals AB,
SE 444 85 Stenungsund, Sweden.

SympaTex®
(a hydrophilic polyether-ester copolymer). SympaTex Technologies GmbH, Feringastrasse 7a, D-85774 Unterföhring, info@sympatex.com.

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