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## The use of Asian paper conservation techniques in Western collections

Pauline Webber

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Pauline Webber

## The use of Asian paper conservation techniques in Western collections

### Introduction

This paper is drawn from my own experiences working as a paper conservator at the Victoria and Albert Museum in London for over 25 years, and my time working as an independent conservator for collections in the USA since 2007.

The hugely varied collections in museums, historic houses and private collections present conservators with challenges and problems on many levels, and the demands made on collections, especially in public institutions, continue to increase. There is an even greater emphasis to exhibit collections than in the past. Like the V&A, many museums and institutions have been involved in education since their inception, when collections were acquired for study and research, with no idea that this material would one day be travelling around the globe for loans and exhibitions. Some items that may have been considered as ephemeral and were acquired in an unstable or poor condition are now seen as important for reference and study purposes. Such compromised and damaged materials have required inventive, resourceful, reconsidered and ethical treatment solutions.

In the past, some techniques and materials used for the treatment of large works on paper involved heavy linings and the over-zealous use of adhesives, often rendering the objects stiff, inflexible and very susceptible to damage if not stored and handled correctly. These treatments would sometimes obscure information on the verso. The choices of materials used at that time reflected what was available for use. Some of these techniques, especially methods for lining, are described by Alan Donnithorne.<sup>1</sup>

### History

The Conservation Department at the V&A has a history dating back to 1856, when it was known as the Art Work Shop, with staff categorized as 'repairers'. The professional transition from repairer to conservator did not occur until after the Second World War; 'Then change was an inevitable part of the explosive growth and development of conservation throughout the world, urged by the need; generated by headlines such as the Florence floods and Venice in Peril both in 1966'.<sup>2</sup> These crises brought members of the profession together from around the world to share their expertise, knowledge and skills. Conservators shared their ideas and techniques, and the use of thin, soft, strong Japanese papers and starch-based adhesives was adopted at this time and used in many conservation processes.<sup>3</sup>

It was during the 1970s that paper conservators in the West started to investigate, study and evaluate the methods used in the conservation of Asian art on paper and how they could be adapted and used in Western collections.

One of the first papers published on this subject was by Ben Johnson at the IIC Lisbon Conference of Paintings and the Graphic Arts (1972). The paper was called 'Oriental Mounting Techniques in the Conservation of Western Prints and Drawings'. In it, he described lining a poster with Japanese paper and starch paste.<sup>4</sup>

1 Alan Donnithorne, 'Paper Lining: An Overview', in *Lining and Backing: the Support of Paintings, Paper and Textiles. Papers Delivered at the UKIC Conference, 7-8 November 1995* (London: United Kingdom Institute for Conservation, 1995), 16.

2 Johnathon Ashley-Smith, 'Chapter 1: The Practice and Science of Conservation at the V&A', in 'Development of Conservation History' (unpublished, n.d.).

3 Sandra Grantham, 'Developing an Approach to the Conservation of Japanese Screens through Historical and Technical Study: An Investigation into Current Practices' (PhD thesis, Royal College of Art/V&A, 1999), Part 1, 17-19, CD-ROM. Dr Sandra Grantham traced the history of training in Far Eastern conservation, and states that the first Western conservator ('repairer and restorer') at that time was a Stanley Littlejohn at the British Museum (BM). In 1910, he learned some Japanese and took the opportunity to acquire and practice some technical skills during a visit to the BM by a group of Japanese printers and scroll mounters. Among the visitors was at least one *Hyogushi* (master scroll mounter) who was persuaded to stay longer at the BM, until 1918, training A.H. Atkinson in Japanese scroll mounting.

4 Ben Johnson, 'Oriental Mounting Techniques in the Conservation of Western Prints and Drawings', in *Conservation of Paintings and the Graphic Arts: Preprints of Contributions to the Lisbon Congress, 9-14 October 1972* (London: International Institute for Conservation of Historic and Artistic Works, 1972), 517-25.

5 Professor Katsuhiko Masuda, former Head of the Textiles Section of the Tokyo National Research Institute of Cultural Properties, is the key figure in the establishment and success of ICCROM courses on Japanese paper conservation, and was presented with the 2007 ICCROM Award, <http://www.iccrom.org/>.

6 Keiko Mizushima Keyes, 1939–89, was an internationally acclaimed paper conservator. She served as a conservator to museums and private collections around the world. She published and lectured widely, and was responsible for many innovative conservation treatment solutions for works of art on paper. 'She was a pioneer in blending the best of Eastern & Western Restoration methods': Robert Futernick, 'Obituary: Keiko Keyes', *The Abbey Newsletter* 14, no. 1 (1990), <http://cool.conservation-us.org/byorg/abbey/an/an14/an14-1/an14-108.html> (accessed 10 June 2015).

7 Masako Koyano has been Director of 'The Art Conservation Lab', Nakanuku, Tokyo, since 1974. In 1979, the Foundation of American Institute in Conservation (FAIC) published *Japanese Scroll Paintings: A Handbook of Mounting Techniques by Masako Koyano*. This handbook aimed to provide conservators in the West with valuable help in the cross-fertilization of ideas within the conservation profession. The book was based on notes that Masako Koyano had accumulated while she was training as a scroll mounter, and provides conservators with a detailed guide to the tools, materials and methods of mounting.

8 Pauline Webber, 'East and West: A Unified Approach to Paper Conservation', *The Paper Conservator* 30 (2006): 43–56.

9 F From 1639 to 1854 the Dutch were the only Europeans permitted to enter and live in Japan. The Dutch East India Company records named Japanese paper as cargo both for the Netherlands and for India ('3000 sheets' of Japanese paper). See: <http://www.ngv.vic.gov.au/essay/rembrandt-etchings-on-oriental-papers-papers-in-the-collection-of-the-national-gallery-of-victoria> (accessed October 2014).

10 Simon Lawrence, ed. *Tales from Bleeding Heart Yard: Stories about Stanley Lawrence* (Denby Dale: Fleece Press, 2000).

11 Webber, 'East and West', *Paper Conservator* 30, 43–56.

In the mid-1970s there were some notable conservators such as Prof. Katsuhiko Masuda,<sup>5</sup> Keiko Keyes<sup>6</sup> and Masako Koyano,<sup>7</sup> who stimulated this investigation and interest further, through publications, lectures, demonstrations and training. Masuda taught numerous courses on Japanese paper conservation to conservators worldwide. These courses were extremely successful and led to the foundation of workshops now taught to groups of international conservators on a regular basis in Japan under the auspices of ICCROM (the International Centre for the Study of the Preservation and Restoration of Cultural Property). Participants have in turn continued the dissemination of his teaching amongst their colleagues and students. His courses have given the conservator an understanding of the different properties of paper and paste combinations and the need for exactness in the approaches to lining, and how some of these methods could be adapted and used for Western collections.<sup>8</sup>

Here follows a summary of some of the materials, tools and techniques used in Asian conservation, particularly those that have been adapted by conservators working for Western collections, including types of paper, pastes, brushes and other tools, as well as how techniques relating to scroll mounting and the methods used in the construction of the sliding screen, the folding screen, and paintings on panels have been adapted for use in Western collections.

### Japanese paper

#### 1 The availability of Japanese papers in the West

During the latter half of the nineteenth century, paper items such as prints, lanterns, fans and screens were exported from Japan to the West in considerable quantities. This was later followed by the import of Japanese paper as a commodity in the form of copy paper, vellum paper and other printing papers.<sup>9</sup>

During the first half of the twentieth century a number of artists in Europe and America adopted and adapted the methods and materials of Japanese woodblock printing for their own work. This led to specialist paper dealers that catered for these printmakers, to stock and supply Japanese paper, the quality and details of which were not always certain.

Established in London in 1859, T.N. Laurence sold good quality Western papers for artists and printmakers. The business also stocked Japanese *gampi* tissue and *hosho* for printmaking as early as 1935, when the printmaker John O'Connor described visiting the business in Red Lion Passage in 1935: 'I climbed the rickety stairs . . . The room was small, with a counter down the centre, a bookcase of tempting box and pear wood blocks, and shelves of inks, engraving tools, folders and leather pads on the right. Kept out of sight were the beautiful Japanese papers'.<sup>10</sup> Prior to the 1970s, many of the Japanese papers used in conservation treatments were papers for printmaking.<sup>11</sup> The choice of very thin conservation quality papers was mainly limited to lens tissues such as L2 and Eltolin™ tissue.

It was not until the late 1970s and 1980s that good quality papers suitable for conservation use became available. In 1972, Faulkner Fine Papers (now incorporated with Shepherds) was founded and sold conservation materials and equipment, including quality Japanese mounting papers. In Europe, Japico Dressler & Co., based in Frankfurt, Germany, was also a source of Japanese conservation papers.

In 1982, Stuart Welch (Atlantis Paper Company, and now Conservation by Design) started to sell Japanese mounting papers and was one of the first companies to purchase brushes and other tools from Japan. In the same year, the Japanese Paper Place opened in Toronto, Canada. Since 1988, Hiromi Paper in California has been a major supplier of Japanese papers for conservation in the USA.

One of the few specialist suppliers of conservation quality papers from Japan at this time was Paper Nao, founded in 1984, and later the Masumi Corporation, both based in Tokyo.

Most papers favoured for conservation treatments in Western collections are made from paper mulberry or *kōzo* fibres, and include *minogami*, *sekishu shi*, *tengujo*, *udagami* and *misu* papers. Over the years, conservators have gained a greater understanding of the characteristics and quality of Asian papers. There is much more information regarding the quality of papers now, suppliers are more informed and are aware of conservation requirements, listing information such as the fibre content, the fibre cooking method, the pH, the weight, the loading or filler as well as the method of drying.

Satoshi Hasegawa from Mino Prefecture makes conservation quality papers where disinfectants have not been added to the formation aid. For many years, Timothy Barrett in the U.S. has made *kōzo* paper with watermarked lines that allow the sheet to be easily torn into widths suitable for repairing tears, or reinforcing strips, and more recently similar machine-made paper is being made in Japan. Also, the increased appreciation of papers from China, Korea and Taiwan has led to their considered use for specific treatments by paper conservators in the West.

## 2 Examples of conservation treatments using Japanese papers

Paper conservators will select papers with particular qualities that combine well with Western techniques and materials.<sup>12</sup> Careful selection of paper and attention to the consistency of the paste has enabled very weak, moisture-sensitive objects to be successfully lined and strengthened. For example, lightweight *mino* paper<sup>13</sup> and *tengujo*<sup>14</sup> have been successfully used for repairing or lining objects with friable or sensitive media on the vacuum table, where thinner, porous papers such as these are more effective. A combination of *tengujo* paper and wheat-starch paste was used to line an eighteenth-century embroidered textile panel now on display in the British Galleries at the V&A Museum (Fig. 1).

Textile conservators might normally have selected a silk crepe fabric or Stabiltex™, a lightweight open-weave polyester fabric used with a heat-set adhesive, but, because of the very uneven silk satin fragile support of the



**Fig. 1** 'St Paul on the Road to Damascus'. 17th century embroidered textile panel on a satin silk support with raised embroidery and watercolour. Photograph © courtesy of the Victoria and Albert Museum, London.

<sup>12</sup> Ibid.

<sup>13</sup> *Minogami*, *usunino*, *tengujo* and *misu* are papers made from paper mulberry (*Broussonetia Kazinoki* Seib).

<sup>14</sup> *Tengujo* is made in Kochi Prefecture. It is a thin white paper made from paper mulberry fibres (*kōzo*) which are thoroughly rinsed after beating to remove any impurities and hemicellulose, resulting in a soft, porous and dimensionally stable sheet of paper. Sheet size measures 51.5 x 51.5 cm, the mould is 103 x 51.5 cm. To make the wet sheet easier to handle, it is often cut in half prior to peeling it off the post to place it on the drying board.



Fig. 2 Paper-cut by Anna Maria Garthwaite made in 1708. Knife cut paper with pinpricking and collage. Paper and ink on vellum backing. 32 x 40 cm. Photograph © courtesy of the Victoria and Albert Museum, London.

15 Marion Kite and Pauline Webber, 'The Conservation of an English Embroidered Picture using an Oriental Paper Method: A Joint Approach', *The Conservator* 19 (1995): 29–35.

16 *Misugami* is a soft, porous, fine-textured paper made from the inner bast white fibre from the *kōzo*. Calcium carbonate powder is added to the stock in the vat. It is made in Kochi Prefecture. The delicate, soft surface of the sheet allows it to adhere easily to other sheets with a very dilute solution of starch paste adhesive. It is couched directly onto the papermaker's drying board.

17 *V&A Search the Collections*, s.v. 'E.1077-1993', <https://collections.vam.ac.uk/item/O78126/papercut-garthwaite-anna-maria/> (accessed 10 July 2017).

textile and raised silk embroidery, it was decided that a paper conservation method was a more sympathetic and suitable method of treating this object.<sup>15</sup>

*Misugami*<sup>16</sup> was used to support a fragile early eighteenth-century paper-cut made by Anna Maria Garthwaite. It worked to hold the weak and fragmented structure together, but because of its thin structure was hardly visible (Fig. 2).

As an adult, Anna Maria Garthwaite was considered to be one of the most talented silk designers of her generation working in London. Some of the trees in this cut-paper work resemble her watercolour textile designs of the 1720s.<sup>17</sup> The paper-cut depicts a country house surrounded by gardens, with huntsmen chasing deer in a wooded park, and in the upper right corner are a village and a parish church.

It was made by first applying black pigment to one side of a sheet of brown paper. The picture was cut out using either a scalpel-like knife or very fine scissors. Some of the surfaces of the picture were textured with small holes made by a needle or pin. To create a more three-dimensional effect, tiny paper fragments were adhered to tree branches brown-side up. The 'cut-out' paper picture was then laid onto (not adhered to) a sheet of white vellum so as to make all the details as clear as possible. The edges of the vellum sheet were attached with animal glue to a wooden board and placed into a frame.

Much of the conservation treatment carried out on this item was performed with the use of a low-suction vacuum table. It was used primarily to hold the paper-cut in place in order to position very small pieces of the design and to carry out repairs prior to lining. Small breaks in the design of the paper-cut were joined with *tengujo* paper coated with a mixture of wheat starch and methylcellulose, and reactivated with moisture. Both the textile panel and the paper-cut were extremely moisture reactive. To minimize the amount of moisture, pasting out lining papers onto a wooden surface, blotting paper or 'craft' paper will remove some of the moisture or wetness in the paste. When pasting out *misu* paper, apply thin paste to the wooden surface of the table or board, pitch the paper and with a damp brush pull the paste from the surface of the table/board into the paper. After treating the Garthwaite paper-cut, to give added support to its very delicate structure, it was agreed to display it at a slightly obtuse angle of 112 degrees.

Another lining method was devised using *usumino* and *mino* papers to repair some extremely moisture-sensitive tempera paintings on paper,

painted by the seventeenth-century artist, Franz Cleyn. These paintings were lined successfully by combining two methods in order to control the risk of mobilizing the discoloration in the support; firstly, by spraying the support with a 2% solution of Klucel L™ (hydroxypropyl cellulose) in industrial methylated spirits to strengthen the weakened areas of the support. This treatment enabled the work on paper to be more evenly humidified prior to lining by controlling the amount of moisture absorption in the weak areas. The paintings were then lined with a lightweight *usumino* paper and thin freshly prepared wheat-starch paste.<sup>18</sup>

Thin, soft papers such as *tengujo* and *minogami* were used successfully as an interfacing layer for cleaning the delicate surfaces of *thangka* paintings and fresco paintings. In book conservation, various types of Japanese papers have been useful for many procedures. To repair leather spines, *mino* paper coloured with acrylics has been successful, rather than using pared-down leather.<sup>19</sup> Furniture conservators have used it for repairing damaged leather chair seats and object conservators for reed and straw work in ethnographic conservation, where they can be easily twisted, plaited and rolled. Textile conservators have used *tengujo* with Klucel G™ for a prepared paper film for the repair of splits in an eighteenth-century English dress made from painted silk imported from China. The samples were adhered to silk using a solvent reactivation technique used in textiles conservation where IMS (Industrial Methylated Spirits) vapour is applied onto the silk through Sympatex™, a semi-permeable membrane.<sup>20</sup>

Papers such as *mino*, *tengujo* and *gampi* have for many years been coated with heat-set and water-based acrylic adhesives and used for repairing transparent tracing papers. *Gampi* paper, because of its colour and smooth surface, was used for the repair of Islamic manuscripts in the early 1970s at the India Office Library.

## Adhesives

### 1 Wheat-starch paste

Wheat-starch paste is a tried and proven adhesive in Asian conservation, used either as a fresh paste, or as an aged paste, depending on the adhesion requirements.<sup>21</sup>

Wheat starch can also be mixed with other adhesives where certain properties are needed. It has been used with methylcellulose to control the risk of water staining when lining objects with a gouache-type media or a matte surface.

A small amount of polyvinyl acetate (PVA) can be added to wheat-starch paste to create a better bond for adhering paper to polyester textiles such as Theatex™ used in the process of support preparation for wallpapers or other large works on paper.

A mixture of animal glue and wheat-starch paste (3 parts starch paste and 1 part animal glue) was used as the adhesive with a medium-weight Japanese *kōzo* paper for facing eighteenth-century arabesque designs on handmade laid paper, thought to be by Michael Angelo Pergolesi (Fig. 3). The panels had probably been prepared and painted *in situ*. Uncut overlapping sheets of paper were pasted directly on to the plaster wall. The sheets had been further prepared with a gesso ground and painted with pigments bound with oil and then varnished. The facing paper was used to help protect the painted surface of the panels during their removal from the walls, and with the application of several layers of a cotton textile adhered over the facing paper the panels were safely removed.

18 Meryll Huxtable, 'The Lining of an Unglazed Fragile Painting on Paper from Ham House, Attributed to the 17th Century Artist Frans Cleyn', in *Lining and Backing: The Support of Paintings, Paper and Textiles. Papers Delivered at the UKIC Conference, 7-8 November 1995* (London: United Kingdom Institute for Conservation, 1995), 119–23.

19 Vanessa Haight Smith, 'The Fix—the Art of Camouflage', in *Unbound*, Smithsonian Libraries Blog, <http://blog.library.si.edu/2014/10/the-fix-the-art-of-camouflage/>.

20 Elizabeth Anne Haldane, 'Encounters with Paper Conservation: The Treatment of a Chinese Painted Silk Dress', *V&A Conservation Journal* 59 (2000): 14–16.

21 In Asian conservation, starch-based adhesives have been used since the Chin dynasty (AD 265–420). For a fuller discussion of early conservation and mounting processes, see R.H. van Gulik, *Chinese Pictorial Art as Viewed by the Connoisseur* (Rome: Istituto Italiano per il Medio ed Estremo Oriente, 1958; New York: Hacker, 1981); Webber, 'East and West', *Paper Conservator* 30, 43–56.



**Fig. 3** Decorative panels salvaged from 138 Piccadilly, London. 18th century arabesque designs painted in oil with a gesso ground onto laid paper adhered to plaster. Photograph copyright Merryl Huxtable.

## 2 Seaweed adhesive (*funori*)

*Funori* is a seaweed alginate used in Asian conservation for the mounting of Chinese and Japanese hand scrolls. It is often mixed with wheat-starch paste to increase slip when applying the paste and flexibility when dry.

*Funori* can also be used with rayon paper to temporarily face paintings on silk during de-backing or for consolidating pigment. Historically, for the purposes of facing, *mino* paper would have been used in Japan, but rayon paper has become a common and cheaper substitute. Additionally, *funori* can be used as a consolidant for gouache-type media because it produces a matte-surfaced, thin film.<sup>22</sup>

Research undertaken in Switzerland developed an extraction and purification procedure to obtain a refined polymer from red algae. Under the brand name JunFunori®, it is currently sold as an alternative to traditional consolidants. Recently developed in Canada is a new product, Tri-Funori™, which can be used as a cleaning agent, a fixative and a light adhesive.<sup>23</sup>

<sup>22</sup> Susan Catcher and Lucia Burgio, 'Pugin's Wallpaper from the Grange', *V&A Conservation Journal* 50 (2005): 22–27.

<sup>23</sup> Tri-Funori™ is a recent conservation product developed in Canada. It is effective as a fixative, a cleaning agent and as a light adhesive. It is derived from two species (*Gloiopeltis furcata* and *Gloiopeltis tenax*) of red seaweed (*funori*), <http://www.tri-funori.com/>.



**Fig. 4** A selection of brushes used in Western conservation studios. a) *misu bake*, (b) *shioki*, (c) *nori bake*, (d) *uchi bake*, (e) *nade bake*, (f) *nade bake*, (g) *nade bake*, white hemp palm, (h) *omote uchi bake*, (i) *omote uchi bake*, (j) Tapping brush, (k) calligraphy and stencil brushes, (l) chinese row brush. Photograph copyright Philip Meredith.

## Tools and equipment

### 1 Brushes

Some paper conservators have adopted Chinese and Japanese brushes, and other tools such as horsehair sieves and paste trays, for use since the late 1970s (Fig. 4).<sup>24</sup> They may be used as originally intended, or adapted to the needs of the conservator, such as the soft *noribake* or paste brush, originally made for applying thin paste, but which is also sometimes used dry, for tamping down lightweight soft papers.

Brushmakers have also modified brushes to meet the needs of conservators, such as the production of softer, more flexible smoothing brushes made from pliant white or red hemp palm, or *shuro*, and the facing brush, or *omote-uchi bake*. This was developed in the 1990s and is made from tightly bound horsehair. Originally it was used for tamping down delicate facing papers, but it has proved to be useful for various processes in the treatment of wallpapers and other large works on paper.

Other brushes that have found a place in Western conservation studios are soft horsehair stencil brushes, which can be useful for toning or dyeing small sheets of paper, and the Chinese row-brush with soft sheep's hair, used for dyeing large sheets paper and silk. The cylindrical tapping brush is useful for tamping down paper repairs applied to the verso of the object.

### 2 Paste trays and sieves

Many conservators have selected equipment sourced from kitchenware shops and the catering industry, such as sieves with stainless steel or nylon mesh that is less easily damaged than traditional (and expensive) horsehair. Wooden Japanese paste trays come in various sizes and shapes. The wooden sushi bowl has been a good alternative. The round cutting knife, or *marubocho*, is a very useful for cutting stacks of paper, but needs to be correctly sharpened and well maintained to prevent rusting.

### 3 The drying board (*karibari*)

The *karibari* or drying board is used in Asian studios as a tool for the stretching and drying of objects, and has also found a place in some Western paper conservation studios (Fig. 5).<sup>25</sup>



Fig. 5 Making a *karibari*. Photograph © courtesy of the Victoria and Albert Museum, London.

<sup>24</sup> For a fuller discussion on brushes and other tools, see: Andrew Thompson, 'Japanese Brushes for Conservation', in Paul Wills and Dr Nicholas Pickwoad, eds., *Hyōgu: The Japanese Tradition in Picture Conservation*, special issue, *The Paper Conservator* 9 (1985): 42–53; and Thompson, 'Japanese Tools for Conservation', *The Paper Conservator* 30 (2006): 65–72.

<sup>25</sup> For further discussion, see: Webber, 'East and West', *Paper Conservator* 30, 52–3; and Pauline Webber and Meryll Huxtable, 'Karibari—The Japanese Drying-Board', in Paul Wills and Dr Nicholas Pickwoad, eds., *Hyōgu: The Japanese Tradition in Picture Conservation*, special issue, *The Paper Conservator* 9 (1985): 54–60.

Drying boards or walls, constructed from a wooden lattice frame covered in layers of paper, are common to Chinese, Japanese and Korean studios. They can have a coating to allow for easier removal of the items when ready. In some Chinese mounting studios, layers of paper are pasted directly onto the wall.

Alternative drying surfaces or drying boards have been made using painting canvas fixed to wooden stretchers and covered with machine-made wove paper or Japanese paper. Hexagonal core cardboard panels or Gatorboard™ are also used. The surface can be coated with a weak PVA solution if required.

### Methods and techniques

Many conservation methods and techniques used in the treatment of works on paper, in particular large fragile works, have been adapted from methods used in scroll mounting.

A very important aspect of the adoption of these procedures and a reason for this shift in approach was that, in Asian conservation, certain tasks are performed in sequence and handling is minimized as much as possible, a concern that is paramount when treating large, delicate objects.

I would like to describe how some of the techniques used in scroll mounting and in the construction of the Japanese folding screen and sliding screen have been adopted, adapted and modified for the treatment of some objects in Western collections.

#### 1 The workshop or studio

Western paper conservation studios sometimes reflect influences drawn from both Chinese and Japanese conservation workshops—for example, the red worktops with a smooth durable surface chosen to function in a similar way to the red lacquer worktables used in a Chinese mounter's workshop. The red surface makes it visually easier when separating and removing wet linings from objects on very thin paper. The boards or work surface are supported on adjustable trestles that can be lowered to make pitching large sheets of paper easier.



**Fig. 6** Facing wallpaper using thin rayon paper. (a), (b) before treatment, (c) during cleaning, (d), (e) thin cut sheets of rayon paper are brushed down onto the surface of the wallpaper, (f) after facing the wallpaper is turned face down and the old backing materials are removed. Photograph copyright Pauline Webber.

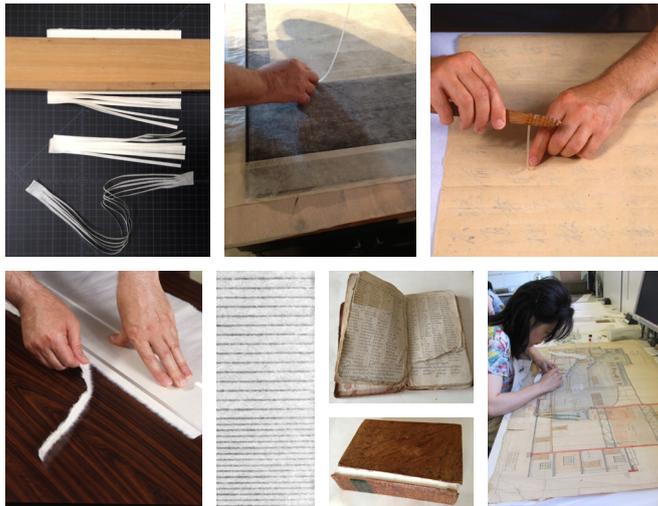


Fig. 7 Orifuse crease repair.

In the *Book of Mounting*, Chou Chia-chou in the sixteenth century describes ‘how you should spread under the painting a sheet of oil paper’.<sup>26</sup> In the West, polythene, Melinex™, Bondina™ and Reemay™ have until recently been the favoured materials either to face the object or to use as a barrier between the table surface and the object. Earlier in the text I have described facing works on paper using *funori* with thin *kōzo* paper and rayon paper.

26 van Gulik, *Chinese Pictorial Art*, 298

## 2 Facing large works with rayon paper

Rayon paper is used by conservators of Asian art and is now more popular amongst conservators treating Western collections. It is a paper made from rayon, modified cellulose, with a synthetic binder. Heavier weights can contain chemical wood pulp. It is used as facing material because it is fine, hygroscopic, holds to the surface and can be used as a carrier (Fig. 6).

After cleaning and consolidation, if necessary, the surface of the artwork is lightly sprayed with water to relax it, and small cut sheets of thin rayon paper are brushed down onto the surface of the wallpaper (this also helps to secure the position of the loose fragments). A heavier-weight rayon paper can be applied in the same way. The capillary action helps to draw out discoloration and the thicker rayon paper acts a cushion for delicate surfaces, following the surface contour, as it slightly stretches when it is brushed and smoothed down.

## 3 Crease reinforcing (*orifuse*)

Creases are often present in hanging scrolls and hand scrolls, a result of frequent and prolonged rolling and unrolling. This type of creasing is usually reinforced after the second backing, using narrow strips of paper (*minogami*). These strips must be cut so the direction of the paper fibres runs across the strips for maximum strength to help prevent further creasing occurring. The strips are generally knife-cut and can vary in width (Fig. 7).

Thin paste is applied to the strip, which can be lifted with a bamboo spatula and placed over the crease. Slight pressure is applied to the back of the paper strip once positioned.

Inspired by the use of crease-reinforcing strips in Japanese mounting, this type of repair is often used for repairing tears in wallpaper and posters. Japanese papers coated with heat-set and water-based acrylic adhesives can be used for delicate ribbon repairs to iron-gall ink drawings, tracing papers, works on vellum or small, delicate objects.

#### 4 Lining

In dealing with large-scale objects, linings based on Asian techniques can be a key factor with the solutions they offer: lightweight support, controlled drying, thinner adhesives and ease of handling.

Chinese papers have short fibres and the sheet size can be very large, making them difficult to handle. For this reason, the verso of the object is pasted, the paper is rolled around a stick and smoothed down into place. Alternatively, the paper can be pasted out onto a carrier and placed in the Japanese manner.

Japanese papers for linings are usually pasted and lifted with a flat wooden stick or bamboo stave and pitched, then brushed down onto the back of the object. For ease of pitching, large or heavy sheets may be pasted out onto carriers, such as Melinex™, polythene or rayon paper. Both methods have been used on works in Western collections.

Sheets of paper may be cut and pasted joined together and made into paper rolls. This is an efficient and economical method for applying linings to oversize works on paper. Alternatively, machine-made bast-fibre papers are also used for linings and in support preparation.

When a toned paper is needed for certain objects, it may be dyed with natural or synthetic dyes, or brushed colourants.

#### 5 Methods of drying and flattening

*Tegami* or false margins are used to help fix or position the work on the table prior to lining. This stronger edge is useful for handling and for attaching the work to the drying board.

After lining and repairing the object, it is air dried between felts or blankets. Prior to flattening on the *karibari* or pressing, the object is re-humidified. If it is a large work on paper, such as a poster, it is important that the moisture is evenly distributed prior to attaching it to a board. When sufficiently and evenly moist, the edges or *tegami* can be folded and pasted with a thin/dry starch paste and then secured to the board using a *shigoki* (squeezing brush). A space should be left to insert the spatula for easy removal of the object; this can be done by inserting a strip of paper or folding a corner inward.

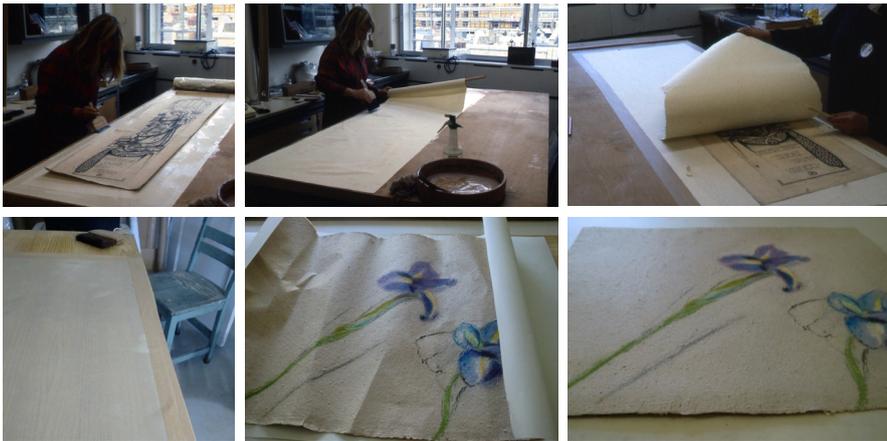
Since some Western works on paper can be heavy when wet, it is preferable to leave the artwork to dry in a horizontal position. Also the artwork should be covered, only exposing the pasted edges so they are allowed to dry first. When sufficiently dry, the art work should be covered with rayon paper or plastic to dry slowly over a long period.

#### 6 Friction drying (*mizubari*)

Friction drying is a method of flattening objects introduced by Keiko Keyes in the mid-1970s, based on the Japanese scroll mounter's method of flattening paper *mizubari* (water mounting).<sup>27</sup>

It is a method suitable for works on paper with sensitive surfaces, or textures, and particularly useful for drying Japanese woodblock prints whilst preserving the impression of the block or blind printing. The humidified work on paper is placed face down onto a sheet of a damp Japanese *mino* paper or thin rayon paper that has been smoothed down onto a work surface. A sheet of moistened *mino* paper is then smoothed down onto the back of the work on paper and placed between heavy blotting paper and weighted with archival board and Perspex (sometimes described as the soft hard sandwich). This method is also useful for pressing Western prints with similar characteristics.

<sup>27</sup> Keiko Keyes, 'The Use of Friction Mounting as an Aid to Pressing Works on Paper', *The Book and Paper Group Annual* 3 (1984).



**Fig. 8** Drying methods using friction, flattening a charcoal drawing and a pastel between machine-made paper.

It is a method that has been adapted for flattening oversize works on paper with sensitive media. A large stained-glass design drawn in charcoal on machine-made paper, and a pastel drawing on coarse handmade paper, were both successfully flattened using the friction method (Fig. 8).

A dampened, machine-made cotton paper, cut to allow for an 8 cm border on all sides, was smoothed onto a wooden board and attached with paper tape and starch paste adhesive. The humidified drawing was placed onto the lightly dampened paper. A further moist sheet of paper was lightly smoothed onto the drawing and the edges of the sheet pasted onto the board and covered with a felt blanket. The drawing was flattened as the paper tensioned on drying.

#### 7 False borders (*tegami*)

False borders, *tegami*, have been used to attach conserved posters or other works on paper to various types of boards, such as Gatorboard™ and Hexalite™, for temporary display in exhibitions. The *tegami* are cut across the paper grain like crease-reinforcing strips. *Tegami* have also been successfully used for attaching oversize objects to supports.

For example, a large colour lithographed poster of 'Rowntrees Cocoa Elect', designed by the Beggerstaff brothers in 1896 and measuring 390.2 x 293.7 cm, was displayed on a temporary support comprising a wooden strainer covered in a polyester woven fabric and Japanese *kōzo* paper pasted to the edges or margins of the strainer to allow for better adhesion (Fig. 9). The strainer was made approximately 18 cm larger than the poster on all sides so that it could double up as a *karibari* and was used to pre-strain and flatten the poster after it had been treated and lined. The poster was removed from the strainer when it was sufficiently flat. It was then reattached to the strainer support using the *tegami* made from a heavyweight strong *kōzo* paper pasted along the edge of the poster and around the edge of the strainer. The polyester textile gave the poster support, acting like a loose lining or cami-lining.<sup>28</sup>

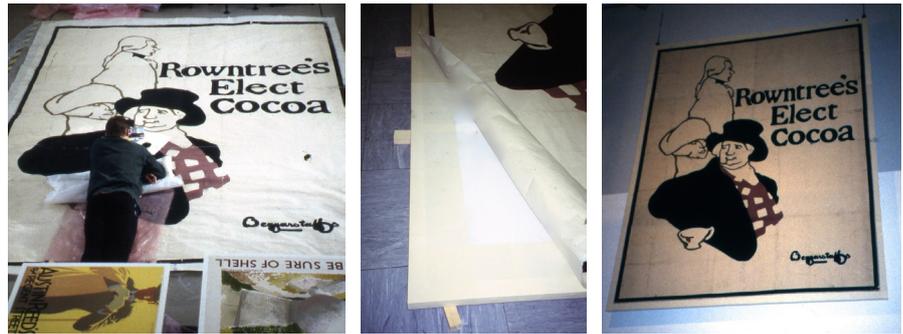
### Projects where Asian conservation methods have been adapted and used

#### 1 The conservation of a leather wall panel

Many conservation treatments are an amalgamation of methods drawn from more than one discipline. The following project drew on the expertise of the Furniture, Book and Paper Conservation Departments at the V&A.

<sup>28</sup> An adapted loose lining or cami-lining, the latter developed at Tate by Peter Booth. See Stephen Hackney, 'Paintings on Canvas: Lining and Alternatives', *Tate Papers*, no. 2 (Autumn 2004), <http://www.tate.org.uk/research/publications/tate-papers/02/paintings-on-canvas-lining-and-alternatives/>.

The polyester remains more rigid and not affected by changes in humidity, thus acting like a loose lining, giving the poster added support while on display. The poster only received a paper support. Past techniques would have been to add a lining of either canvas linen or cotton. The poster could be reversed easily after display and stored rolled on a large diameter tube and wrapped. Smaller posters could be encapsulated or stored in Melinex™ sleeves.



**Fig. 9** Mounting an oversize art-work to a wood strainer covered in Theatex™ polyester fabric and Japanese paper using false margins (*tegami*). Photograph © courtesy of the Victoria and Albert Museum, London.

A combination of Western and adapted Asian techniques were selected to carry out the treatment and display method of leather panels, now on display in the V&A British Galleries. The leather panels came from a house in London designed by the architect and designer Robert Ashbee in 1893. The panels of embossed and carved leather were stitched together to cover the back of the hall behind the staircase (Fig. 10).

In 1966, when the house was being torn down, members of the V&A staff were called in to salvage some of the panels. The panels had sustained considerable damage.

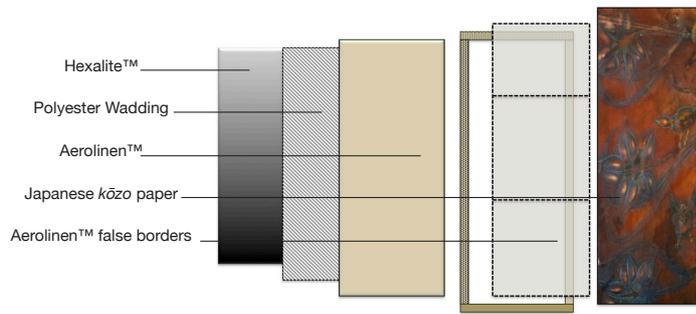
Furniture conservators cleaned and consolidated the flesh side of the leather before the sections came to Book and Paper Conservation, where we had the task of mounting them onto Hexalite™ panels<sup>29</sup> for permanent display.

After some consideration, it was decided to line each leather section with a heavyweight Japanese paper and wheat-starch paste. Heavy paste was applied thinly to the lining paper to achieve a good bond without excessive moisture. For losses along the edges, Aerolinen™ was lined with Japanese paper and toned with acrylics. Hexalite™ panels were joined to the required dimension and edged with birch wood. The boards were covered with Melinex™ and a layer of polyester wadding to give extra support to the

<sup>29</sup> Hexalite™ (formerly Aerolam) comprises a core of hexagonal aluminium between sheets of glass fibre reinforced with sheets of epoxy resin.



**Fig. 10** Carved, gilded and embossed leather panels made by Bill Hardiman and designed by Charles Robert Ashbee. (a) Staircase and hall of the house designed by Robert Ashbee and demolished in 1966. (b) Leather carved panels after treatment, now on display in the British Galleries of the V&A. Photograph © courtesy of the Victoria and Albert Museum, London.



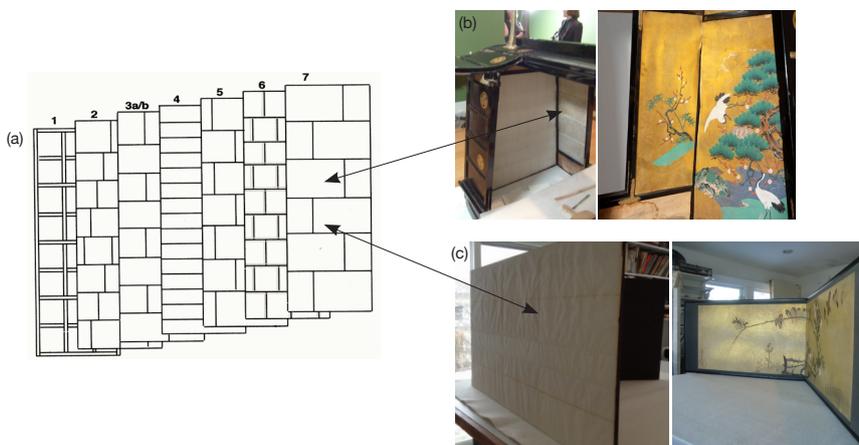
**Fig. 11** System used to display leather panel wall covering. V&A W658-2001. Embossed and carved gilded leather, designed by Charles Robert Ashbee. 835 x 465 mm approx.

embossed, slightly convex wallpaper panels. Aerolinen™ was used to cover the polyester wadding and hold it in place, secured using stainless steel staples into the edge of the panel. The lined leather panels were joined and positioned on the panel and secured along the edges with the prepared pasted Aerolinen™ (Fig. 11).

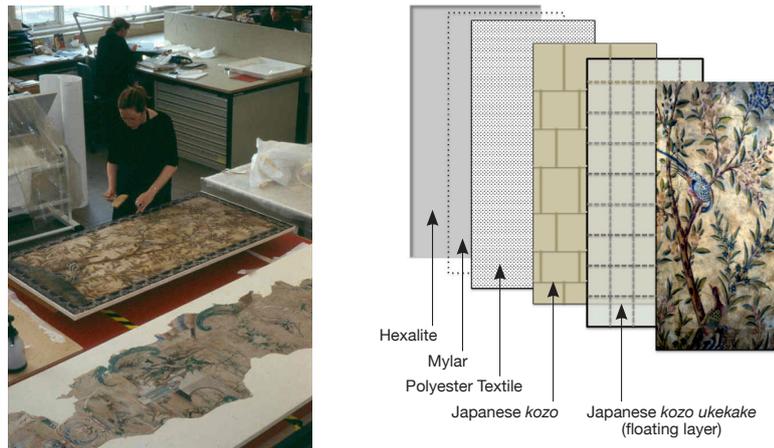
## 2 Mounting and displaying wallpaper

Support panels and support linings for large projects such as wallpapers have drawn on elements that have been used in the construction of the Japanese folding screens, sliding screens and paintings on panels. The techniques and materials used in their construction have been successfully adapted to combine with other materials. The under-linings of a Japanese screen consist of a multi-layered structure that allows for changes in environmental conditions. They separate the artwork from the wooden lattice core whilst maintaining an even distribution of tension. Adaptions of the same technique are used for wall paintings and artworks applied to objects, such as the palanquin in Figure 12.

This system was adopted for the treatment of an eighteenth-century chinoiserie wallpaper prepared for the British Galleries at the V&A. A similar treatment was also used for the treatment and the display of eighteenth-century Chinese wallpaper at the Peabody Essex Museum (PEM) in Massachusetts.



**Fig. 12** The construction of a Japanese screen. (a) Diagram showing the layers of a screen; (b) preparation of the interior of an 18th century palanquin at the Rhode Island School of Design Museum (RISDM), USA. (c) Bi fold Japanese screen. Photograph copyright Pauline Webber.

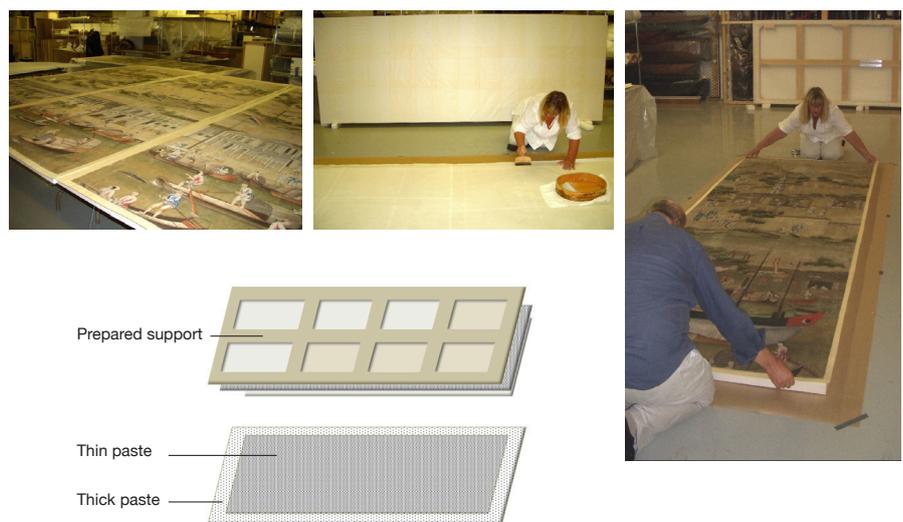


**Fig. 13** System used to display an 18th century Chinese style wallpaper. Photograph © courtesy of the Victoria and Albert Museum, London.

At the V&A, Hexalite™ panels were selected as a support for permanent display. To allow for expansion and contraction of the wallpaper while on open display, it was decided to incorporate an element of the Japanese screen sub-lining construction method, the *ukekake*, or floating layer (Fig. 13). It was chosen because this layer helps spread the tension of the work over the entire support surface, allowing for some degree of expansion and contraction, and ease of removal in the future.

To mount the treated wallpaper at the PEM, individually lined drops or lengths of wallpaper were positioned on to the support panel; when the position was determined, the back of each section was pasted, with heavy paste to the margins and thin paste to the remainder. The prepared support was lowered and placed.

The support was turned with the wallpaper in place and the edges secured. This is how paintings are usually applied to Japanese sliding screens. It is a method that, to an extent, insures against over-stretching the object when positioning and drying (Fig. 14).



**Fig. 14** Mounting Chinese wallpaper at the Peabody Essex Museum (PEM) Salem, MA, USA. Photograph by Kathryn Myatt Carey, reproduced courtesy of the PEM.



**Fig. 15** (a) Wall preparation incorporating a floating layer, *ukekake*. (b) small sheets of knife- and water-cut paper; (c) paper sheets stacked and ready for pasting. Photograph reproduced courtesy of Mark Sandiford of Sandiford & Mapes.

### 3 Using the floating layer (*ukekake*) for wall preparation in historic house interiors

The *ukekake* or floating layer has also been used as a sub-layer in the preparation for wallpaper in English historic house interiors. The floating layer or sub-layer, on top of a polyester and Japanese paper substrate, is used to spread the surface tension overall, and allows for ease of removal of the wallpaper in the future. In the article, 'Architectural Linings and Backings', the authors Doyal and Sandiford express how important it is that the application of the pasted paper to the polyester be thorough and firm, and that the paper fibres should be beaten into the weave of the polyester with appropriate brushes in order to create a good bond. It has been shown through some experimentation that a wheat starch and PVA mix with a medium-weight *kōzo* paper can produce a good bond (Fig. 15).<sup>30</sup>

### 4 Using the lattice core *shitabari*

The *shitaji* (the lattice) and *shitabari* system have been used in the conservation treatments of wallpapers in historic interiors where the system has been considered compatible with the architectural elements in the building. Between five and eight layers of paper were pasted over the wooden lattice in such a way as to create air pockets between the layers. The layers of paper also provided a buffer to protect the wallpaper from the wood and allow for some expansion and contraction of the materials without causing damage.<sup>31</sup>

## Conclusion

Asian conservation in China and, by its influence, in Korea and Japan, has evolved and adapted in its way over many centuries. Tried and proven techniques have been passed on and developed over successive generations. It still proves to be a rich mine of information and inspiration.

With its comparatively shorter history, paper conservation in the West has seen a development and progress that that has accelerated at a rapid speed. Over the past four decades, via dissemination of information

<sup>30</sup> Sherry Doyal and Mark Sandiford, 'Architectural Linings and Backings', in *Lining and Backing: The Support of Paintings, Paper and Textiles. Papers Delivered at the UKIC Conference, 7-8 November 1995* (London: United Kingdom Institute for Conservation, 1995), 60–65; Philip Meredith, Mark Sandiford and Phillippa Mapes, 'A New Conservation Lining for Historic Wallpapers', in Mogens S. Koch, ed., *Preprint from the 9th International Congress of IADA, Copenhagen, August 15-21, 1999* (Copenhagen: Royal Danish Academy of Fine Arts, School of Conservation, 1999), 41–35.

<sup>31</sup> Philip Meredith, T.K. McClintock, Jan Snoek and Ann van Grevenstein-Kruse, 'The Conservation of the Chinese Export Wallpapers at Huis ten Bosch', in *IPC Conference Papers London 1997: Proceedings of the Fourth International Conference of the Institute of Paper Conservation, 6-9 April 1997* (London: Institute of Paper Conservation, 1998), 34–47.

through training and workshops, sharing expertise through publishing and conferences and research made easier through the Internet, a greater palette and refinement of skills has blossomed. One of the many important aspects of this has been the adoption and adaptation of numerous Asian conservation techniques for the successful treatment of works on paper in Western collections.

#### Acknowledgements

I would like to thank all my colleagues, students and interns, past and present, as well as the Victoria & Albert Museum, London, UK; the Peabody Essex Museum, Salem, MA, USA; the Rhode Island School of Design Museum, RI, USA; and private collections.

#### Abstract

This article focuses on the value of the interaction between Eastern and Western paper conservation methods; how the understanding and study of some techniques used in the mounting of Asian scrolls and screens have assisted Western conservators in making more informed choices regarding practical treatments and have benefited both Western and Asian works on paper and other organic materials in collections worldwide. For the most part, I am drawing from my own experiences working as a paper conservator at the Victoria and Albert Museum in London and, since 2008, as an independent conservator in the USA. I started as a trainee paper conservator in the Conservation Department at the Victoria & Albert Museum in London in the late 1970s, when the profession was still in its formative years. It was at this stage in the history of paper conservation that conservators in the West started to investigate, study and evaluate the materials and techniques used in the conservation of Asian art on paper, and how they could be adapted and used in Western collections. My own involvement in Asian conservation began soon after, when I was given the opportunity to work with a conservator of Chinese scroll paintings. I was also fortunate to undertake one of the first of many ICCROM courses given by Katsuhiko Masuda. What I learned during this brief time of apprenticeship and study was the importance of expertise achieved by practice, repetition and sensitive observation; the range of papers, adhesives and tools needed to achieve the required result for repairing and backing artworks mounted as scrolls and screens; the high level of skill required to carry out this work; and how some of these methods

and materials could be used or adapted for objects in Western collections. There are many Western collections that have greatly benefited from the influence of Asian paper conservation. This article shows how some of these adaptations have been evaluated and subsequently developed and modified for the treatment of challenging works on paper of all dimensions, including oversized works, such as wallpaper, architectural drawings and posters. In my article I will give examples of some of these challenges and how practical conservation solutions were achieved.

#### Biography

Pauline Webber studied Fine Art in Painting and Art History and undertook a postgraduate MA at Chelsea College of Art before joining the Paper Conservation Department at the V&A Museum, London. A Supervisor for the RCA/V&A Conservation Programme and an External Examiner for the MA and the Postgraduate Diploma in Paper Conservation at Camberwell College of Art (University of the Arts London), she also served as a member of the assessment panel for accredited membership to the Institute for Conservation of Historic and Artistic Works in Ireland (IPCRA). She was Head of Paper Conservation at the V&A Museum for 11 years and Head of the expanded Book, Paintings and Paper Section for three years until leaving the V&A in 2005. She worked briefly for the Royal Academy of Arts on the Chinese exhibition 'The Three Emperors' before moving to Massachusetts, USA, in 2006. While living in the USA she has been working as an independent conservator and has undertaken consultancy work and contracts for some of the major museums in New England. She also works as a consultant for UNESCO (Beijing Office). She is an accredited member of Icon and member of IIC. She has written frequently for *The Paper Conservator* and other conservation journals, and contributed to various publications on conservation-related topics.

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