

A I C C M PAINTINGS GROUP

SYMPOSIUM 1993



EDITED BY ALLAN BYRNE AND STEWART LAIDLER

ACKNOWLEDGEMENTS

The editors would like to acknowledge the effort of all the contributors who make our symposiums such a success. Special thanks to Lindsey Butterell and Christina Newberry at the Museum of Contemporary Art and the staff at the Art Gallery of New South Wales who helped in the production of these papers.

PAPERS GIVEN AT THE

AUSTRALIAN INSTITUTE FOR THE

CONSERVATION of CULTURAL MATERIAL

PAINTINGS GROUP SYMPOSIUM 1993

HELD AT ROBERTSON - NSW

10 - 11 MARCH, 1993

EDITED BY ALLAN BYRNE AND STEWART LAIDLER

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A.I.C.C.M. PAINTINGS GROUP SYMPOSIUM - ROBERTSON

10-11 MARCH, 1993

PROGRAMME

Tuesday 9th March

7.00 pm Registration
7.30 pm Dinner

Wednesday 10th March

9.00 am Registration
9.30 am A balsa wood backing for the *Garden of Love* – John Payne
10.10 am Conservation of a paint film adhered to glass – Sarah Kemp

10.30 am Morning Tea

11.00 am The materials and techniques of *Chaucer at the Court of Edward III* by Ford Madox Brown – Carrie Thomas

11.30 am Chasing the *Sponsor's dollar* – to be or not to be. An issue for Discussion. – Stewart Laldler

12.30 pm Lunch

1.30 pm Restoration of the Childrens Chapel, St. James' Church, King St., Sydney – Anna Diakowska-Czarnota and Arek Werstek

2.00 pm Contracts: reponsibilities, liabilities – Catherine Lillico-Thompson

2.30 pm *Flowerpiece* by Alan Warren: the conservation of a painting on glass – Linda Waters

3.00 pm Afternoon Tea

3.30 pm The repair of a severely damaged portrait by Alfred Coffey – Peter Cousens
4.00 pm Two Treatments – Description of the treatments on two different paintings with unusual problems – Chris Payne

4.30 pm Panel Discussion – Conservation education – Issues in Australia, both undergraduate and continuing – Chaired by Allan Byrne

7.30 pm Dinner

Thursday 11th March

- 9.30 am The authenticity of panel paintings by Teniers, Jan Breughel the younger and P. Van Der Velde – **John Hook**
- 10.00 am A backing system for bark paintings – **Colin Macgregor**
- 10.30 am Morning Tea**
- 11.00 am Restretching – Proceed with care : An initial examination of tension distribution in a stretched canvas with particular reference to conservation treatments – **Chris Payne**
- 11.30 am An investigation into the properties of sized canvas – **Sally Outhwaite**
- 12.00 pm **Discussion** – Location of conservation suppliers – **Therese Mulford**
- 12.30 pm Lunch**
- 1.30 pm Practical Applications of Rhodamine B : response to the ageing of artists' oil paint – **Gillian Osmond**
- 2.15 pm Recent research on Rupert Bunny – **Robyn Sloggett**
- 2.35 pm **Discussion** time for open forum on sampling – **Robyn Sloggett**
- 3.00 pm Afternoon Tea**
- 3.30 pm History of conservation at the NGV – **Liana Fraser**
- 4.00 pm The painting of a Kittyhawk – **David Keaney**
- 4.30 pm Paint cross-sections – **Chris Adams**
- 5.00 pm **Discussion** – A.I.C.C.M.; Next symposium; other matters
- 7.30 pm Symposium Dinner with guest speaker**

CLOSE

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Sarah Powell
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BALSA BACKING FOR THE GARDEN OF LOVE

John Payne
Senior Conservator of Paintings,
National Gallery of Victoria

"The Garden of Love", attributed to the studio of Antonlo Vivarini, (acc. no 1827/4), was acquired by the National Gallery of Victoria, through the Felton bequest on the advice of Sir Kenneth Clark in 1947. The painting has been the subject of ongoing investigation and treatment for the past ten years and is a complex mixture of the forces that bring about change within works of art. Though the full story of this work is yet to be told a component of its history and treatment is the subject of this paper.

The painting is made up from five vertical planks of timber, none of which were quarter sawn, which predisposed the structure to warping from the beginning. The panel has since been reduced in height by trimming the top and bottom, perhaps in the 18th century or 19th century, and then thinned and cradled in the early 20th century. The structural problems associated with the original construction and the subsequent thinning and cradling led to the panel cracking through the centre. Since the cradling had been applied with the panel in three pieces and then glued back together, it was not possible to free the cradle members. The panel had been reduced in thickness from perhaps 35–40mm to a mere 5–7 mm. With external dimensions of 152 x 239cm removing the cradle without providing additional support was not a realistic option. Of the methods used to reinforce panels the system of building a parquet of balsa wood blocks on the reverse presented a known option.

The Business Council of the National Gallery of Victoria and the Art Foundation of Victoria generously provided the support required to bring Bettina Jessell from Washington D.C. to workshop the removal of the cradle and the application of a balsa backing. The work took place in May 1992 with a month of intense activity involving most of the members of the department. What follows is essentially the treatment report for the process.

THE TABLE

A support for the painting was made from a single sheet of chipboard 25mm thick supported by the rigid box section aluminium support which had been made up in 1986 to attach to the reverse of the cradle in order to remove the painting from the frame. A layer of 5mm thick sofion was attached to the surface with double sided tape and 10 micron mylar stretched over the whole. The support was made slightly short of the length of the panel (to allow for clamping) and approximately 30cm wider to allow a working space on either side. A travelling support for a wax pot was made up to run along these edge margins and above the work. The support was put on the hot table for convenience.

CONSOLIDATION

Areas of lifting paint were consolidated with a mixture of piccolyte resin and microcrystalline wax. The mixture was dropped in place with a heated spatula. The spatula was then used to heat the mixture to allow it to flow. The area was then pressed into place with the top of the fingernail. Excess wax was removed with white spirit.

FACING

A facing mixture of 30% dammar resin in white spirits and 5% raw beeswax was made up. The panel was placed face up on a group of tables. A facing of L tissue, water cut to fit in sections, was applied using the mixture and a Union Jack brushing pattern. The facing was brought up to but not over the edges of the cracks. A single layer of facing was applied and allowed to stand overnight.

REMOVING THE CRADLE

The panel was placed face down on the support table. A hand panel saw was used to

cut through a number of vertical struts and free several horizontal members. The freed piece carried the impressed mark W. MORRIL. Morrill has since been established as working in London in the early part of this century.

Working with a hand saw was prohibitively long and difficult to extend into the central area. A power saw was modified with a 6" fine cut blade, an extended perspex base plate and a frozen stop to set the height. Pencil lines were ruled on the vertical braces to be cut. The cut sections were cleared away, the reverse vacuumed and the unglued horizontal battens lifted out. A number of the horizontal battens were in fact stuck in place with excess adhesive from the gluing in position of the verticals.

This left a network of blocks (the remains of the vertical battens) to be removed. A further series of cuts were made with the power saw, dividing these blocks in 9 smaller sections, cutting to a depth which left approximately 3mm of wood remaining. The segments left from the cutting were then levered off using a chisel and a twisting motion.

With all the sections broken into fragments the reverse was again cleared of debris. The 3mm of cradle timber which now remained was reduced by carving with gouges. A small plane was tried but was difficult to control. In some instances the adhesive layer would break down and the section pop off but this was rare. It was apparent the cradling was not old, the adhesive was still strong. The process of paring down the remaining timber was laborious.

From the moment the cradle began to be released the panel wanted to ride up at either end. A large number of weights had been made up from 3" x 6" x 1" steel bar and these were continuously positioned and re-positioned to restrain the movement of the panel.

Residues of timber and adhesive were removed or reduced with a variety of means. In places the glue would fracture with pressure of a flat chisel. In others a poultice of 3% CMC/wood shavings and 1% ammonia was used to soften the residue which was then scraped away.

ADHERING THE CRACKS

With the cradling removed the reverse was again thoroughly vacuumed particular attention being paid to the cracks. The cracks were further cleaned with slivers of 4 x 5 negative film. Nine-foot long clamps made up from cramping heads on aluminium rectangular section were positioned on the reverse of the panel. Timber L sections were used to protect the ends of the panel. A dry run for the clamping was not done. It was considered the cracks may not open enough a second time for the adhesive to be applied. The adhesive for gluing the cracks was Trubond woodworkers glue, a poly vinyl acetate adhesive with a relatively short setting time.

Since the thinness of the panel prohibited turning it over to ensure alignment of the front surfaces the gluing was carried out with the panel face down and particular attention paid to the alignment of the surfaces on the reverse.

The adhesive was introduced into the cracks with the same slivers of 4 x 5 film used for cleaning. Light pressure was applied to the clamps (six were used) until the adhesive formed beads of excess. The panel bowed under pressure and the ends of the long clamps were clamped back down with G clamps to the table. Wedges of timber were pushed between the aluminium clamp bars and the panel to localise pressure. The weights were adjusted to provide best distribution of pressure. The clamped and weighted panel was left overnight.

THE Balsa BACKING

The wax resin mixture for the backing was microcrystalline wax (Witco 60T) and piccolyte resin 600g to 250g (12:1). A rectangular deep fry unit was used to melt the mixture together and for coating the blocks. A hand lining iron and a small travel iron were used for keeping the adhesive warm on the panel. The blocks were 4" x 8" x 1" precut, however a bandsaw was brought to the studio to cut odd lengths to fit in situ.

A central point was established by spacing out the blocks across the reverse. A number of blocks were put in the pot of adhesive. The first block was positioned in the centre.

Hundreds of mylar pieces 3" x 6" had been pre-cut and a mylar piece was placed on top of the hot block and a steel weight immediately applied. The iron was used to melt any excess wax ready to position the next block. Once the first central line was established blocks were attached outward from either side with two groups of people working with the wax pot positioned on the central travelling support. Barbecue tongs were used to pick up the hot blocks. Individual pieces were cut to fit at the ends to minimise trimming of the completed backing. Attachment of the first layer took several days with up to six people working. When finished the layer was left weighted over a weekend. The weights were then removed and the mylar pieces peeled away. The reverse was ironed to smooth the wax resin and then planed to an even surface with a small hand plane. The plane proved more useable than any other tool for this purpose. At this point the panel still lifted at either end with the weights removed. The back was then ready for the second layer of blocks.

The blocks were again spaced out to overlap the joint lines of the previous layer. The second layer was applied in a similar manner with the plane and a coat of clear polyurethane applied as a sealer. Minimal trimming of the edges was required.

REMOVING THE FACING

With the backing finished the panel was returned to face up position. A slight convex curve was notable at this point. The facing was removed with white spirit. The alignment of the glued cracks was checked and found to be accurate where the cracks were fresh. A crack left of centre top which was old and previously repaired was slightly out of plane. Old repairs from some other cracks had been dislodged in the reglueing.

POSTSCRIPT

The backing has been in place for almost a year to this date and it is interesting to reflect on the process. The panel composite developed a curve of almost 10mm over its length within three days of being completed. When we look at the body of material on the reverse and the thinness of the panel it is difficult to imagine the panel exerting influence

on the backing, however this is in fact what is happening. The arrangement of the planks in the original construction offers alternating directions of curvature, the convention of carpentry, in this case allowing the central plank to develop a concave curve and the planks either side to develop a convex curve. With the cradle removed the panel primarily exerted influence in the convex direction giving an overall curve. A year later a sight line along the panel reveals an undulating curve, the central plank has developed the predicted concave curve while those either side are convex.

A couple of points are worth highlighting here. The panel, though only 5-7mm thick is very much alive, reacting to its environment but also able to establish its preferred orientation. To overcome this the panel would have to be thinned more radically, amounting to a transfer. The treatment of the panel had to respect the fundamental inclination of the original planks. The balsa parquet appears to be able to accommodate the intention of the planks while increasing the bulk of the structure for handling and display.

Much work remains to be done with "The Garden of Love". Our attention is now turned to perhaps the more difficult task of interpreting and restoring the image.

The treatment of the panel would not have taken place without the guiding hand of Bettina Jessell and my thanks for her enthusiasm and dedication are registered here.

THE REMOVAL OF AN ADHERED PAINT FILM FROM GLASS

Sarah Kemp

When I first received the painting I could discern through the cracked oval of the glass a brightly coloured oil, tightly worked, perhaps a harbour scene or seascape. There was no evidence of a signature or any inscription revealing historical details.

The information I received from the owners was simply that the painting was believed to have been brought into the country with belongings of a Methodist minister, ex Liskeard (Wales) who came to abide in Bendigo during the Gold Rush Days (around 1850).

The painting was subsequently damaged in a 'tent town fire' and remained in the condition it was in when brought to me. That is, with no auxiliary support and adhered to the glazing material by means of a discoloured residue and, no doubt also held to the glass by the heat softened paint.

Matters were also complicated due to the lack of a stretcher and the concave shape of the glass which had cracked and placed considerable strain on the paint layer producing planar distortion with associated cleavage, cracking, and abrasion.

After initial documentation and photography of the work, I set about testing the residue to determine its solubility. I soon discovered that it was not the ketones, ethanols, turpentine, nor the more insidious solvents that would remove this film but in fact something quite simple, water. It was at this point that I decided to look more closely at this residue, so I went and stood in the sun.

While I stood there examining the painting I noticed that a small slither of glass had moved a fraction. The sun had softened the residue and I found that it was possible by means of a palette knife, gently introduced between the glass and paint film, to release the slither of glass.

I did not have to wait too long for a good amount of sunshine to remove the rest of the

glass but it was important to determine the extent and degree of adhesion across the painting and to ensure that no more stress was placed on the paint film as the palette knife moved through the residue.

At some points the adhesion was greater, especially at the bottom right corner where presumably more of the sugary substance had collected and burnt to a point where it was fairly welded to the glass, and so paint had then fragmented away from the paint film.

Where I could I weighted areas of canvas and paint film which were free of glass, to prevent further planar distortion and stress to the paint layer. Silicon release was placed under the edges of the broken glass to prevent further abrasion and I continued with releasing the glass from the surface paint layer with the palette knife and the sun.

When all the glass was removed I noticed that in some areas where the painting had been in close contact with fairly flat and thinly painted areas, the residue and possibly the sugars in it had raised the temperature to a greater extent and contributed to the fine blistering of the paint surface.

I continued to clean the painting of its residue using a mixture of equal parts water and methylated spirits. Some areas were difficult to clean. Where the residue had burnt around the edges of the glass a stain is still discernible.

Once cleaned, I set about returning some of the larger flakes of paint to their proper place but it was necessary to remove the flakes from the glass. This was done by painting wax to the reverse of the flakes and removing them with a scalpel. (The wax was applied to prevent the flakes from fragmenting and dropping off thereby confusing their orientation and making placement more difficult).

The fragments, once removed from the glass were then adhered in place with a warm iron, Silicon release paper was placed on the

surface of the paint to prevent further heat damage.

I decided that the painting with its various tears, cleavage, craquelure, blisters and finely woven and deteriorated cotton support required more than just strip lining, so I set about preparing it for a hand wax lining.

There was no need to inject the blisters individually as the biggest among them were less than one millimetre in diameter, therefore not much distortion would have occurred due to

the paint being softened during the lining process.

An auxiliary support was found and cut to the required size and the painting restretched.

The rest of the treatment consisted of in-filling losses of paint, applying isolating varnishes and final varnishes and in-painting with oils. Parts of the sky were, of course, more difficult to match due to the fineness of the paint. Nevertheless, we had the frame gilded and the client was very pleased with the final result.

THE MATERIALS AND TECHNIQUES OF "CHAUCER READING AT THE COURT OF EDWARD III..." BY FORD MADOX BROWN.

Carrie Thomas

1. INTRODUCTION

These notes were made in connection with a two week placement at the Art Gallery of New South Wales where myself and two other students from the University of Canberra, Michele Wassal and Caroline Lehne, assisted Stewart Laidler in cleaning Ford Madox Brown's painting "Chaucer reading at the court of Edward III...".

The painting was begun in London in 1847 and completed in 1851. However Brown made significant reworkings in 1855, and retouched the work again sometime later, prior to it being acquired as the founding item in the collection of the Art Gallery New South Wales.

On removal from exhibition last year for treatment the painting was found to have undergone a previous major restoration, probably by Bill? Hall or his son, involving a relining, varnish removal, major amounts of retouching due to a significant loss along the bottom edge as well as other smaller losses, and large areas of overpainting apparently following abrasion during cleaning.

A thick natural resin varnish layer was applied at this time. This had since discoloured, distorting the tonal balances and spatial relationships of the work.

The previous restoration, Brown's own reworkings and his varied paint application created a complicated situation, and numerous questions arose during the recent cleaning as to the artist's intent. We sought answers using literary sources, particularly Madox Brown's diary, as well as detailed visual and technical examination.

2. AESTHETIC AIMS OF FORD MADOX BROWN AND THE PRE-RAPHAELITES

Ford Madox Brown was a near contemporary of

and loosely associated with the Pre-Raphaelite Brotherhood, but was never a member.

Brown's training in the Academies of Bruges, Ghent and Antwerp grounded him well in the traditions of nineteenth century history painting. During independent studies in Paris he moved away from the dark academic style of his training towards experiments with more natural lighting effects. Sources included Rembrandt, the Spanish masters, and the works of Delaroche, Delacroix and Gericault.

Later in Italy he drew from the light filled spaces, clarity of outline and distinct drawing of the Italian masters. These Italian influences may have been more prominent in "Chaucer..." before his own later reworkings.

By the time Brown returned to England in 1846 and began painting "Chaucer..." he was a mature artist already experimenting with new ideas in realism. He was initially sympathetic to the aesthetic and technical ideas of the Pre-Raphaelite Brotherhood, but later he became dismissive of their determination to throw out all rules of academic grouping and harmonious palette. Brown's drive towards truth to nature was expressed in accurate drawing and clear light and he recorded his objection to the Pre-Raphaelite's obsession with minute drawing and uniform paint application.

However, like the Pre-Raphaelites, Brown was keen to throw off the Academy system "which allowed only a small proportion of light to have place on the general surface of what otherwise was only partially modified darkness".

Brown's technical preoccupation throughout painting "Chaucer..." was "to carry the notion of light and shade absolutely as it exists at any one moment instead of approximately or in a general style".

In order to have two lights to give the

appearance of figures in the open air both in sunlight and in shade, Brown rigged up a system of blinds in his studio.

The effect of sunlight continued to pre-occupy Brown, and in 1855 he returned to the painting to reinforce the shadows and re-work some entire passages.

3. TECHNIQUE

Brown's diary and surviving sketches indicate that he adhered closely to the preparatory stages suggested by his academic training. These were :-

1. An oil sketch
2. A drawing in chalk
3. "An outline of the whole as it now is"

This compositional work was followed by thoroughly working up individual passages on paper before committing them to canvas. Surviving drawings and the absence of pentimenti on the finished painting indicate that Brown deviated little from his designs once he began painting.

Brown's diary also tell us that he followed nineteenth century practice, and painting was carried out on the canvas in three stages:

1. Laying in the dead colour
2. Strengthening the colouring with a second painting
3. Final glazing and scumbling

However, rather than working each step over the entire canvas before moving onto the next stage, Brown, like the Pre-Raphaelites, worked up individual figures or groups separately through stages one and two before moving on to another group or passage. This means he could not see the development of overall balances in light and colour until the picture was almost complete. The final glazing and scumbling was then carried out over the entire composition.

White grounds

Brown, like the Pre-Raphaelites, used a white ground in order to introduce luminosity: "nothing like a good coating of white to get a bright sunny colour" pre-empting the general shift by English artists towards the end of the

century from a dark or tan coloured ground to light grounds.

Holman Hunt described the wet white technique which he and Millais both arrived at independently :-

- The outline of a passage was drawn in over one or two dry white layers
- On the morning of painting the area was coated with fresh white from which all oil had been drained on a piece of absorbent paper
- Transparent or semi-transparent colour was built up on the wet ground with sable brushes "and the touches...made so tenderly that the ground below shall not be worked up, yet so far enticed to blend with the superimposed tints as to correct the qualities of thinness and staininess, which over dry ground transparent colours would inevitably exhibit."

Brown wrote while painting "Chaucer..." of "always laying the flesh in with pure white" so we were looking for evidence of the wet-white technique. Although some of the cross-sections show two white preparatory layers suggesting selective reinforcing of the white priming, we failed to find blending of a wet ground with superimposed colour, as described by Hunt. Indeed, Brown's broad paint application would not be suited to the meticulous laying in of colour.

After further research into the literary sources we discovered that Brown did not try the wet white process until 1854, an experience which he found unsatisfactory.

Verisimilitude

Rather than using the fine application to achieve minute detail, in "Chaucer..." Brown created a variety of textures with contrasted paint application. Paint varies from thin vehicle rich layers to dense textured layers with brush marks retained to thick wet impasto sitting on the surface. Pencil drawing is visible through passages of thinly applied paint and contributes to the description of forms.

A feature of Brown's technique which raised questions during the cleaning was the thin rubbed appearance of many passages. In some

cases this appeared to have resulted from previous overcleaning. In other areas the thin rubbed appearance was not so clearly the result of misadventure, as in the bunch of flowers and the water of the central font which are described with thick brush strokes over a thin rubbed looking underlayer. Still other areas are ambiguous, and we could not determine whether the effect was deliberately created by the artist, or the result of abrasion during previous cleaning.

In fact Brown seems to have used a technique used by William Etty who rubbed in the shadows, thinly with earth colours, then the mid-tones and lights were superimposed leaving the darker passages exposed. This was much admired and fully described by Hunt. Brown, also an admirer of Etty, mentions visiting his studio around the time he began "Chaucer..."

Brown also used several types of sgraffitto to make subtle adjustments to the tonal balance and details of certain passages:

4. MATERIALS

4.1 Support

The texture of the closely woven linen canvas is visible throughout "Chaucer...", but the weave pattern may have been emphasised during the glue lining. During the 1860s Brown habitually ordered double primed canvases from Robersons', possibly under the influence of the Pre-Raphaelites who preferred a smooth even surface.

The current stretcher may originate from the time of the relining. By the 1860s Brown was in the habit of using pannelled stretchers, suggesting a concern about the corrosive action of the polluted atmosphere.

4.2 Media

Brown made extensive use of copal varnish added to drying oil in equal parts – "find it dries quick and does not sink in on retouching". Other mediums mentioned by Brown and in his account at Robersons' include magilp, "glass medium", siccatif de Harlem, and Soehnee varnish.

4.3 Pigments

Many new and synthetic pigments became

available during the 19th century as the proliferation of industrial processes lead to their accidental and deliberate synthesis. Brown, while painting "Chaucer..." still showed a relatively cautious approach to colour. He did however make use of a number of newer pigments, mentioning light yellow, cadmium, yellow lakes, madder, asphaltum, lemon yellow, "chrome" (chrome yellow?, or perhaps chrome green or viridian?) and emerald green for shadows.

The pigments that he specifically mentions in his diary were nearly all new in the nineteenth century, suggesting he appreciated the qualities these bright colours could offer and considered them worth noting among more standard colours.

5. CONCLUSIONS

The nineteenth century witnessed many new materials and techniques in oil painting, partly because of the breakdown in the apprenticeship system towards the end of the previous century. Brown, like many artists, experimented with the different mediums and the many new pigments which had become available as the industrial revolution progressed.

"Chaucer..." however relies also on the traditions under which Brown had been trained, those of the academic history picture unified by compositional devices and harmonious tonal quality.

My experience during cleaning this painting emphasized for me the importance of a full understanding of the artists aesthetic aims as well as his materials in order to make responsible decisions during treatment. In this case interpretation of the physical evidence provided by the painting proved difficult because of the effects of previous restoration, while the opportunity to take representative cross-sections was limited because the paint film was largely intact. Thorough examination of the literary sources helped to create a clearer picture of the artists' original intention.

CONSERVATION OF THE MURAL PAINTINGS FROM THE CHILDREN'S CHAPEL IN THE CHURCH OF ST. JAMES, KING STREET, SYDNEY

Anna Diakowska – Czarnota, Arek Werstak
International Conservation Services

LOOKING FOR A METHOD OF TRANSFER

INTRODUCTION

The murals are situated in the crypt of the Church of St. James. They were painted in 1928 by the Turrumurra Wallpainters Group and are believed to be the last surviving example of their work in Australia. On this occasion, the group were joined by Grace Cossington-Smith, Roland Wakelin and Roy de Maistre to paint the chapel to the designs by Ethel Anderson, who was the leader of the Turrumurra Wallpainters Group and a great patroness of the arts of the time.

The mural depicts the carol "I Saw Three Ships" using contemporary icons in a style that the children using the chapel could identify with. The half-finished Sydney Harbour Bridge is an important landmark in the local setting. On the north wall, a male figure wears vestments that were banned by the church in the early 1930's as being too "popish" and is an important documentation of clerical dress within the Anglican Church.

It has been documented that the condition of the mural deteriorated quite soon after completion and that members of the group had undertaken retouching of the mural from time to time. It is rumoured that conservators from the Art Gallery of New South Wales had participated in conservation measures in the chapel over several decades, though there is no documentation to support this, only word of mouth.

By 1992 the murals were in an advanced state of deterioration. Large areas had already been lost and large areas were rapidly detaching from the wall. The construction of the wall and the way in which the walls had been prepared

for the mural were largely responsible.

After examination of the Chapel it appeared that the East and West walls and the ceiling of the vault were the most affected by salt damage and that there was little choice than to remove the paint layer from the walls. A partial transfer of the murals seemed the only solution.

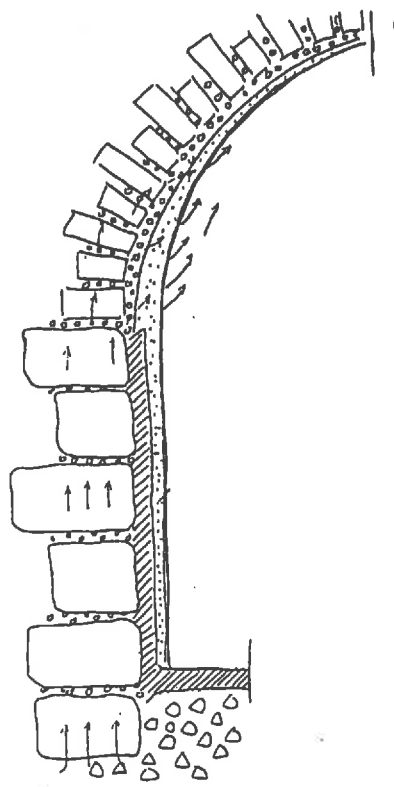
There were several details that affected our decisions about the method of partial removal of the mural paintings in St James Church which required some innovations and departures from the traditional techniques of mural transfer.

The first departure was forced upon us to solve the problem of a very brittle paint layer and facing adhesives that were not suitable for the job. We added polyethylene glycol to the facing adhesive colletta (Phillipot and Mora recipe) to soften the paint layer and to improve the adhesion between the facing and the paint layer. Our second innovation related to the introduction of in-painting directly onto the back of the paint layer after the original gypsum layer had been removed, prior to the reapplication of the new gesso layer.

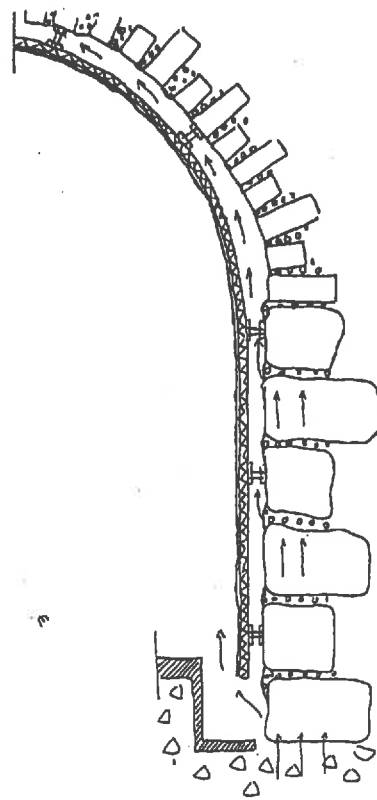
Footnote:

1. It was the result of an enquiry made to the Art Gallery of NSW in the late 80's that this current work came to fruition. Anne Gaulton was working at the Art Gallery at the time and her personal interest in the murals and her encouragement of the staff of the Church led to the work now being done by International Conservation Services Pty Ltd made possible by a grant from the Heritage Council of NSW. Work commenced in October 1992 and will be finished by the end of August 1993.

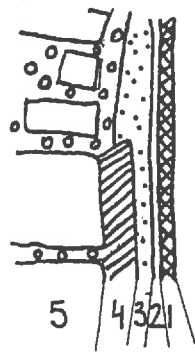
FIGURE 1 STRUCTURE OF SUPPORTS



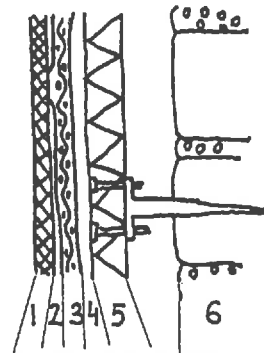
BEFORE CONSERVATION



AFTER CONSERVATION



5 4 3 2 1



1 2 3 4 5 6

1 - PAINT LAYER

2 - WHITING

3 - GYPSUM

4 - CEMENT

5 - SANDSTONE, BRICKS,
LIME RENDER

3. ACRYLIC GESSO WITH
STABILTEX

4. LASCAUX ACRYLIC
ADHESIVE 498 #V

5. FIBREGLASS

6. SANDSTONE, BRICKS

METHODOLOGY OF A PARTIAL TRANSFER

Prior to any work, the Chapel was thoroughly documented. Colour transparencies, black and white photographs and a graphic record of location of damage and deterioration was carried out.

Samples were taken from the gold, the paint layer, the salts found on the surface and the gypsum and lime render of the substrates. Analysis was carried out by Artlab in South Australia. Cross-sections were made to understand the stratification of the mural. The medium was identified as a proteinaceous substance, most likely to be a casein tempera, painted on a thin layer of polished gypsum, with an interlayer of glue based whiting. The gilding was applied onto a coloured glue size. The support for the paint layer on the walls was different than that in the vaulted area. The lower walls, to a height of approximately one metre, were constructed of sandstone block, covered by a cement render, followed by gypsum, upon which the paint was laid. The vaults were constructed of bricks covered by a lime render of varying thickness, followed by the gypsum.

This difference between the composition of the support in the vaults and on the walls had a great influence on the condition of the mural and on the method of transfer.

Being of sandstone construction and having been built over an underground stream, the walls were allowing moisture to be drawn up, evaporating at the earliest opportunity, where salts crystallised on the surface or between layers of the murals' construction. The cement render on the lower part of the east and west walls and probably the north and south walls, which have been left intact, acted as a barrier to the escape of the water, and presence of salts in this area was limited. The salts were identified as nitrates, chlorides and sulphates.

The north and south walls were in better condition than the east and west walls and the vaulted ceiling; so we presume that there is an easier way for the moisture to escape from the walls than through the paint layer in these areas.

Our decision to partially remove the murals

from the walls and vaulted ceiling was governed by the impossibility of effectively drying out the walls or creating barriers to stop the penetration of the moisture and further migration of the salts.

We therefore proposed to treat the north and south walls in situ and to transfer the vaulted ceiling and the east and west walls.

TESTING THE METHOD FOR TRANSFER

To carry out the transfer we tested the techniques developed by Philipot and Mora¹. Also taken into consideration was the survey of techniques by Ostaszewska² the Polish conservator.

Because of the differences in construction in the vaults and walls, two basic transfer methods were considered:

"Strappo" removal of the paint layer and
"Stacco" removal of paint and support.

From the beginning it was clear that the vaults could be removed using the stacco method because large areas of loss indicated the bond to be weak at the gypsum/render interface. The walls where the gypsum had been applied in a very thin layer onto the cement were a different matter and we considered that strappo may be the only suitable method as there was such a thin layer behind the paint for cutting from the wall using the stacco method.

The first tests were carried out on the gilded area. Using "colletta", consisting of animal skin glue, vinegar, oxgall and oil of cloves as a fungicide, we applied a number of different types of Japanese tissues, fibreglass tissue and various woven fabrics to determine the most successful facing. The results of these first tests were very encouraging. Using the strappo method we were able to remove the gold layer with sizing as well as the whiting layer, intact.

Identical tests were carried out on the painted area with somewhat different results. It became very clear that we could not remove the paint layer with either strappo or stacco without first removing all overpaint. Even after removal of overpaint, it was impossible to remove the paint layer with the strappo technique because in places the bond between paint and gypsum

was much better than between paint and facing resulting in large areas remaining on the wall. Problems of contraction of the facings also resulted in breakdown of the bond between the facing and paint. In considering the stacco method of removal this problem of achieving a good bond between the facing and the paint layer was essential. The paint layer appeared quite thick and brittle and because the gypsum was so thin behind it, the introduction of a cutting tool behind the gypsum in itself presented a threat to the intact removal of the paint.

The colletta of the facing also needed more flexibility. The recipe for the stacco method of removal calls for molasses as a plasticiser, however due to the brittleness of the paint this was not sufficient to maintain the strong bond at facing/paint interface. We reasoned that if the paint was more flexible, then the chances of maintaining a good bond with the facing would be better.

This led to our first departure from the method prescribed by Philipot and Mora.

In the next test area we added one part polyethylene glycol to one part of molasses as the plasticising component of the colletta. The results were most satisfactory and we concluded that with this addition, the paint layer was softened slightly to allow a good bond with the facing for removal using the stacco technique. We were then able to proceed with some confidence.

TRANSFER TECHNIQUE

Following the tests of the various methods of transfer, the following procedure was adopted, the technique varying slightly according to the construction of the mural in each area.

The Vaults

After thorough cleaning and removal of overpaint the vaults were prepared for transfer using the stacco technique.

The vaults were to be removed in small sections from three different areas, the top parts of the East and West walls and the vaults would need to be replaced. This would allow a sacrificial area for the cutting to allow it to be

taken out in smaller sections for ease of handling. It would also allow an area for joining of the new rigid fibreglass support that would need to be made in at least three sections, due to the restricted sizes of doorways and corridors in the crypt.

Where the paint and gypsum had already been lost, these areas covered with tracing paper so that the facing would not adhere to the lime render.

Facing the painted areas was carried out using a thick application of colletta directly onto the paint. Then two layers of Japanese tissue was applied by brushing, impregnating it with the colletta. This was followed by one layer of fine open weave surgical gauze and then one layer of fine muslin. The colletta used was the same as the recipe proposed by Philipot and Mora except that the ortho-phenyl phenol was replaced with oil of cloves.

The facings were allowed to dry out overnight. The dryness of the facing was crucial for the safe removal of the paint and gypsum. If too dry there was a tendency for the facing to break away from the paint during removal and if too wet, it allowed the facing to stretch and crack the paint and gypsum. In areas with a strong salt presence the facing remained quite wet.

The area to be removed was cut through in designated areas following the edges of the design where possible, to a depth that would release the paint and gypsum layers at the lime render interface. The piece was removed by first tapping with a mallet to dislodge the bond at gypsum/lime render interface, then by prising apart with round-end palette knives of varying lengths. During this process the piece being released was supported by a light weight polystyrene and plywood support curved to the shape of the vault. This was used to transfer the piece onto the "working support", a more rigid curved structure used to provide a strong working surface whilst the gypsum was scraped from the back of the paint layer.

The scraping of the gypsum was necessary to remove the presence of salts to which the gypsum acted as host. The scraping was carried out using a variety of implements; scalpels, chisels, plane blades, cabinet

scrapers, sanding discs, grinding heads and small wire brushes. The thickness and the hardness of the gypsum varied thus necessitating different tools. In some areas the back of the paint could cleanly be exposed, in other areas the paint seemed too fragile for complete removal and so a thin skim of gypsum was left.

Consolidation of the back of the paint film was made with Paraloid B72 in toluene (2.5%). Whilst the back was saturated, the underdrawing could be clearly seen.

During the scraping process it was noticed that some areas behind the gilding had been coated with a yellow size which came away with the gypsum. The yellow size appeared to have given the gold a greater intensity. Because of this we felt it was important to replace the yellow before applying the gesso. Tests confirmed that the underpainted gold looked more intense, so this procedure was carried out wherever gilding was present. Thinking along these lines we reasoned that underpainting all colours with a mid-tone of each colour area would substantially reduce the time required for detailed inpainting later. Therefore where the back of the paint film was exposed cleanly, a mid-tone of that colour area was applied using Rowney acrylic paint for compatibility with the new gesso layer, the next layer to be applied.

The gesso used was a Liquitex Acrylic Gesso. It was applied in five brush coats to the back of the paint film. In the fifth wet layer, Stabiltex polyester cloth was embedded in the gesso. With a palette knife, more gesso was applied to fill the pores of the polyester cloth, then a further brush coat of gesso was applied. The acrylic gesso provided a very flexible ground, which would be necessary for later application to the curved fibreglass structure.

After the laying of the gesso and application to the Stabiltex the facings were removed. This was done using a steam gun and sponging with water to remove any residue of the colletta from the paint surface. Each piece was then placed between felts and left to dry under weights. This eliminated a slight tendency for the acrylic gesso to shrink slightly after the steaming to remove the facing.

The pieces were then ready for trimming and

piecing together for application to the fibreglass shell. The adhesive to be used in this process is Lascaux Acrylic Adhesive 48 HV, which is applied to both the back of the transfer pieces and to the surface of the fibreglass shell as a dispersion. After evaporation of the water the adhesive can be reactivated with solvent to provide contact adhesion.

The fibreglass shell is to be made in three sections to the exact shape of the Chapel vault and walls. The structure is supported by aluminium ribbing for strength and rigidity. Prior to the installation all remaining plaster and lime render will be removed from walls and vault to provide an air-space between the sandstone block or brick structure and the fibreglass. The fibreglass shell will be bolted into brick or sandstone and will in effect be suspended, the bottom edge being free to provide greater air circulation. The ends will be "bridged" in to join up with the North and South walls. The air-space is necessary to assist in drying out the walls and together with the fibreglass acts as a physical barrier to future salt damage.

The Walls

The procedure for transfer of the walls was very similar to that employed on the vaults. The "stacco" method was used, using the same basic colletta, but with substitution of half of the molasses plasticiser with polyethylene glycol (600) to soften the embrittled paint layer and help adhesion of the facing.

The successful facing of the lower walls (up to 1 metre in height) was essential for their removal. There was only 2mm of thickness of gypsum between the paint layer and the concrete render on the sandstone block. The paint needed to be flexible to accommodate the cutting tool that sliced the gypsum layer away to release the paint layer.

The gypsum on the back of the lower walls displayed very different characteristics after removal than the gypsum layer of the vaults. The gypsum on the vaults released quite cleanly at the gypsum/lime render interface, even retaining the impressions of the scores made to lime render to give better tooth for the gypsum during preparation. The gypsum on the lower walls was stuck fast to the concrete and

required abrasive and slicing action to separate it. After release the back appeared like small pebbles, some of which could be removed by prising off with a palette knife, while others required the same type of scraping as for the vaults.

After removal of the gypsum the procedure as previously described was carried out.

CONCLUSION

It has been most useful throughout the course of treatment of these murals to have had the experience of Philipot and Mora to guide us. However it is important to remember that each situation must be individually assessed and the appropriate treatment devised.

We have documented what was appropriate in this case. Whilst the process of transfer may be considered an extreme treatment, there are occasions where such a treatment is the only course of action and we considered this one such occasion.

REFERENCES

- 1 Mora P, Mora L, Philipot P, Conservation of Wall Paintings, Butterworths 1989
- 2 Ostaszewska M, Przenoszenie malowidet sciennych W Polsce, BMIOZ, LV, seria B, Warszawa

CONTRACTS: RESPONSIBILITIES AND LIABILITIES

**Catherine Lillico-Thompson
International Conservation Services**

A case study relating to the Occupational Health and Safety Act, 1983.

There are many types of contracts that can effect conservators; employment contracts, contracts with clients, contracts with sub-contractors; which in turn are effected by the terms and conditions of the contract, as set down by statutory regulations and codes of practice, and this implies that there are responsibilities and liabilities on the part of all parties.

In this paper I wish to limit my discussion to identifying particular areas of contracts as they relate to the Occupational Health and Safety Act, 1983, aims to protect the health, safety and welfare of people at work. It lays down general requirements which must be met at places of work in New South Wales.

The provisions of the Act cover every place of work in New South Wales. The Act covers self-employed people as well as employees and employers.

A Federal Act is also in place to cover work places operated by the Federal Government, but if situated in New South Wales, the New South Wales Act applies concurrently where the Federal Act does not cover that field.

Many of these Acts, Codes of Practice or Statutory Regulations only become relevant to us when they are tested.

We often conduct our work in the belief that we would comply with regulations and that we are employing responsible safety procedures and using safety equipment that is providing adequate protection.

Many of the substances we use in conservation carry health warnings, but how many of us take heed to that warning, and under the legislation, how would we be liable.

There are various offences and penalties

associated with the Act. Liability is judged by penalty units, and a penalty unit is equal to an amount of money which can be changed from time to time by the Government. The maximum penalty for an offence by a company is 2,500 penalty units (equivalent to approximately \$250,000.00). For individuals the maximum penalty is 250 penalty units and two years jail, though it is a defence to claim that the breach of the regulations was due to circumstances over which the person had no control, or that it was not reasonably practicable to comply with the regulations.

Under the Act, employers must ensure the health and safety of him/herself and his/her employees as well as anyone else who may visit the workplace by providing and maintaining equipment and systems of work that are safe and free of risk to health, such as arranging safe use, handling, storage and transport of equipment and substances. They must provide the information, instruction, training and supervision necessary to ensure health and safety at work.

Authorities such as the Workcover Authority have been established to help employees and employers improve standards of safety and health at work by providing advice on training in health and safety by conducting workplace inspections, scientific analysis and technical assistance.

The occupational Health and Safety Act, 1983, can challenge our work practices and what we believe to be safety measures. An employee or someone not an employee can lodge a complaint with the Workcover Authority or other such regulatory body, in order to bring practices and procedures in line with the Act.

In this particular case study, the contract between the provider of services and the client stated that the provider of services had to "Insure (the client) against liability, loss, claim or proceeding as related to workers compensation and Employer Liability Insurance

or any liability loss, claim or proceeding whatsoever arising under any statute or at Common Law in respect of personal injury to or death of any person whomsoever arising out of or in the course of the works (carried out by the provider of services) unless due to any Act or neglect of the client". Faced with such a contract, a complaint by any person associated with the client is enough to warrant the defence of ones practices.

The complaint was made by an employee of the client about excessive amounts of solvents such as toluene and acetone in the air, which was claimed to have effected the voice of the person making the complaint and to have caused headache and dizziness.

Whilst we believed that the solvent use was within safe limits of usage, we had no proof. The client put a stop to work until such time that we could provide that proof.

Workcover Authority's Scientific Services Branch, known as Workcover Techsource was brought in to monitor the solvent levels to determine the health hazard resulting from this environment. A number of other commercial analytical services could have been used, all offering services at similar prices, however Techsource were able to respond almost immediately.

Organic vapour monitors were placed in the breathing zone of three designated people to evaluate solvent exposure levels for a period of 300 minutes.

It should be noted that one of the designated people being monitored was in a room separated by a door that had been sealed off with tape and plastic sheeting, held in place with 8 plywood, as well as the glass doors of the room. The other two people were in a small room measuring approximately 7.5 metres in length by 3 metres wide by 3 metres high where the solvents were being used. Both were wearing respirator masks with organic vapour filters, ventilated by one large window which remained open. A carbon filtered extraction system was working in the areas where toluene was used. The toluene was applied with a cotton wool swab, which was then disposed of in a metal container with a lid with a hole in it to pull the swab off the stick. The other person

was using Paraloid B72 in acetone, applied with a wide brush, without direct access to the extractor.

The collected sample was removed from the activated carbon wafer contained in the organic vapour monitor, it was desorbed and analysed by gas chromatograph.

There was no detection of solvent outside the room with the sealed door. The person working with acetone registered a concentration of 21 parts per million, compared with the Australian Exposure Standard of 500 parts per million. The other person in the room who was working 1 – 2 metres from the area of application of the acetone, registered 4.4 parts per million. In the case of toluene, the user registered 2 parts per million, and the other person had no registration of the solvent at all.

The Exposure standard represents the airborne concentration of a particular substance in the workers breathing zone, which, according to current knowledge should not cause adverse health effects or undue discomfort to workers.

The solvents monitored in this case: toluene and acetone, at very high concentration may have depressive effects on the nervous system and include slowing of reaction, incoordination, dizziness, headache, nausea and tiredness. However, according to the results of the analysis, the Workcover Authority found that the levels of concentration were well under permissible levels, in spite of the odours of the solvent being perceptible, and therefore no health hazard was likely to occur.

Though the levels were low we cannot overlook the possibility that some people have a greater sensitivity to solvent than others, and extra precautions such as the wearing of respirators in areas where odours are perceptible would need to be considered.

Neither should we overlook the need to properly inform people working or visiting a work-site of the solvents and chemicals being used at the time, and if at all hazardous, make sure that they understand the risks and the proper method of minimising the risk to one's health, by the proper use of safety equipment and procedures.

In an interesting case where it was company policy to instantly dismiss employees who were in breach of company safety and health procedures as in the case of **Bostik (Australia) vs. Gorgevski**. Mr Gorgevski a Yugoslav national, whose first language was not English, smoked in an area that was clearly a designated "non-smoking" zone for safety reasons. He was instantly dismissed. He appealed against his dismissal claiming that he had not understood the company policy as it had not been explained to him in his own language and the company had never asked him if he understood the instruction not to smoke in those zones designated "non-smoking".

The Court found Mr Gorgevski's dismissal unfair as it was the employers responsibility to ensure that their instructions and policy directions are understood by employees whose first language is not English.

Just as the Workman's Compensation Act of 1926 attempted to provide a better workplace for employees and assistance for those injured at work, so too does the Occupational Health and Safety Act of 1983 attempt to protect us from hazards in the workplace and encourage better work practices and conditions by regulation through a Statutory Authority.

REFERENCES

1. "The New South Wales Occupational Health and Safety Act, 1983"
2. Holmes, N. "Painters Hazard Handbook", Operative Painters and Decorators Union of Australian, 1990.

FLOWERPIECE BY ALAN WARREN: THE CONSERVATION OF A PAINTING ON GLASS

Linda Waters
Conservator, Paintings Project
National Gallery of Victoria

INTRODUCTION

The Paintings Project, which addresses the need for structural repair to works in storage, has involved extensive surveying during which I found an oil on glass, still in its frame but broken in two with a second break across the top right corner. The surface of the glass was covered with deteriorated sellotape and the frame was losing its hand painted finish. The work, "Flowerpiece", was painted by the late Alan Warren, a Melbourne artist who attended the Bell school of art in the thirties.

The condition of the work and the fragility of the support lead to it being treated as a priority in the Paintings Project. The treatment centred around devising a suitable method of repair which would not compromise the paint layer but would allow the work to be easily supported in its original frame. It also involved removing tape and adhesive residue both from the glass and the paint layer, plus inpainting losses along the breaks. Inpainting was complicated by the nature of the painted surface so a support was devised enabling the reverse to be inpainted whilst viewing the front of the painting.

"Flowerpiece" was acquired for twenty one pounds in 1949, soon after it was painted, and featured in the quarterly Bulletin of the National Gallery of Victoria in 1950 (Vol.4, No.2). In a double page spread entitled "Four Contemporary Paintings". One of the other featured works was "The Artist's Studio" by Pierre Bonnard, acquired through the Felton Bequest in the same year.

The technique of painting on glass requires painting in reverse the image one sees through the glass. It was taught by George Bell at his Bourke Street School in the mid to late 1930s, after being "discovered" by Geoff Jones who was one of his students. Geoff Jones' interest in this particular method was aroused by two paintings by Valentine Prax at an exhibition at

the National Gallery.¹

The technique became somewhat of a craze and was practiced by others, including Russell Drysdale, David Strachan and Sybil Craig, whose works on glass were exhibited in the recent exhibition "Classical Modernism: The George Bell Circle" held at the National Gallery of Victoria

Geoff Jones had painted with Alan Warren in the past, so was contacted with a view to finding out about the technique: he tends to work from a preparatory drawing which he traces onto the glass in Indian ink. The painting is checked periodically by placing it the right way around on an easel, on which there is a piece of white paper or board to provide a background. Thicker paint was applied for greater opacity of colour, and in addition, the reverse is covered with a light shade of paint on completion to add greater luminosity to the colours. This does not appear to be something Alan Warren has done in his works on glass.

Alan Warren says of "Flowerpiece": "When painted it was a challenge and a financial necessity. I could not afford canvas so used picture framing glass. The challenge was to work in reverse ie light tones or colours first and the darker ones last..." and with reference to another of his paintings on glass says "The difficulty associated with working in reverse explains why it is unsigned and undated".

BRIEF CONDITION

"Flowerpiece" is framed with what appears to be a recycled Victorian frame with a white pigmented finish, most likely applied by the artist. The profile is very deep in cross-section and has an embossed running design with deep recesses. There was widespread flaking and loss of the pigmented finish. The painting was held in the frame with a plywood backing board in direct contact with the painted surface.

The paint layer is characteristic of oil and in places enamel. There is no varnish layer. In many places the paint has been applied in layers so that the colour seen on the reverse is not necessarily that seen from the front. There is some sgraffito and unpainted areas of the support through which the plywood backing can be seen, and, surprisingly, considering that the work is viewed from the unpainted side of the glass, there are areas of high impasto, noticeably on the flowers. There were numerous losses of paint associated with the break.

TREATMENT

The work was unframed whilst horizontal, and after various tests the frame was consolidated using 5% Primal in deionised water applied by brush, after firstly wetting the area with a mixture of 70:30 water/ethanol to encourage penetration. Sarah Kemp undertook the hands-on work associated with the frame treatment. Testing was undertaken on pieces of wood which were incised to replicate the deeper areas of decoration and coated with a mixture of chalk and gelatin to simulate the finish on the Warren frame. It was necessary to consolidate the full depth of the finish without changing the chalky appearance of the surface or causing staining or tide-marking from water soluble materials in the wood.² White spirit was used to remove the tape still adhered to the surface of the glass and the degraded residue was then removed using acetone. The dull coating left was then cleaned with ethanol, then the whole surface was cleaned with deionised water. The area around the breakage was cleaned under magnification to avoid the possibility of solvent travelling into the crack and affecting the paint layer. Later, sellotape was found adhered directly to the paint, and this was removed with white spirit also, though some adhesive residue was left on the surface of the paint.

The backing board was found to be adhered to impasto in the paint layer in the top left corner. This was located by the following method: strips of silicone-release Mylar were inserted between the painting and the backing on two sides and drawn along them until they met resistance. They were then marked and measured to locate the area. The backing was then released by inserting into the appropriate

area a Teflon spatula wetted with petroleum spirits. Some fibre from the plywood was left on the surface of the impasto.

In addition to this, gummed brown paper tape was adhered directly to the paint layer over the break. It had lifted from the surface in places, taking with it some thinner area of the paint layer, predominantly the blue and dark green paint. This was not immediately obvious on viewing the work from the front, as the paint on the tape was held to the glass by the backing board.

After trying various ways of introducing moisture, the tape was removed using deionised water applied on swabs to wet the paper, after which the softened fibres were lifted with tweezers. This was repeated down to the gum layer which swelled and could also be lifted from the paint. The ease with which this was done varied over the surface of the painting. In places removing the tape and residue became too difficult, even under the stereo-microscope, so a residue of fibres and gum was left on the surface of the paint.

The paint adhered to the paper tape was then reattached to the glass using 15% B67 in petroleum spirit (100–130 o.b.p.) due to its low order of solubility combined with satisfactory appearance. B72 produced a clearer film, but was not used due to the paint being slowly soluble in xylene.

The adhesive was applied directly to the glass in the area of loss and also to the fragments of paint still adhered to the tape. The tap was aligned, weighted and left to dry. Alignment was particularly difficult, as the tape, together with the thin layer of attached paint, appeared to have shrunk. This is perhaps most likely to have occurred as the tape was drying (and shrinking) after having been swollen by the application of water to activate the gum. When the adhesive was dry, the excess paper was removed with moisture as described earlier, however a thin residue of paper impregnated with the resin was left on the surface of the paint layer.

This method was successful in recovering these losses of paint however the adhesive layer between the glass and the paint appears "silvery" from some angles. Inpainting of losses

along the breaks was undertaken using Maimeri Restorers colours which were found to most closely approximate the appearance of the original paint layer seen through the glass. Dry pigments in resin were found to be too granular and unsaturated in appearance.

Inpainting was complicated by the necessity to work on the reverse or painted side of the glass whilst simultaneously viewing the front of the work. A framework was devised which held the work at an angle above the table allowing a mirror to be used underneath to view the face of the work. The painting was supported on a clear perspex tray.

Inpainting was difficult due to the transparency of the support, and the layered nature of the paint film. The inpaints had to match the paint layer both on the front and the back of the work, and the addition of paint on top of the first layer of inpainting often changed it somewhat in terms of tone and colour, requiring the lot to be removed and started again. Colours were painted on Mylar strips and held against the losses to determine their suitability before using them, but despite this, often had to be redone.

Methods of repairing the break were investigated. The use of adhesives normally used for glass repair, such as epoxies, was ruled out due to the high order solvents required to remove them. The nature of the break – a small surface area to be repaired in a large sheet of glass – meant that the sheet would also require additional support, whether or not the break was adhered.

It was decided to use a sandwiching system which would hold the broken sheet together, account for the areas of high impasto on the reverse and provide an appropriate appearance in terms of aesthetics. It also needed to be lightweight but rigid enough to hold the glass without flexing, and strong enough to support the weight of two sheets of glass – that of the original painting and that used for the top layer of the sandwich. The whole ensemble also had to fit into the original frame which had a shallow rebate and would also not support heavy modification.

The work was sandwiched between glass and an aluminium honeycomb backing board, using

a sheet of closed cell polyethylene foam to cushion the impasto. An interlayer was needed between the foam and the paint layer to prevent adhesion and provide a background colour to simulate the original plywood backing which was seen behind the painting through areas of sgraffito.

It was decided to use Japanese tissue, toned with watercolour applied by airbrush, for the interlayer. Mylar was considered, though paper has the advantage of being porous and therefore more easily removed than Mylar in the event of adhesion. Two layers of a medium weight tissue were used which approximated the tone and density of the plywood and allowed the sgraffito to sit comfortably within the composition.

Mylar was also considered for use as interleaf between the face of the painting and the optical glass cover to prevent glass to glass contact, however it could be seen between the two, due to shallow distortions in the sheet, so was not used.

The sandwich was held together using self-adhesive aluminium tape (3M Scotch pressure sensitive tape) which was thin enough so as not to interfere with the rebate of the frame, yet strong enough to hold the sandwich together. Strips of ragboard were used to protect the edges of the painting from the adhesive on the tape. The aluminium sheet was 6mm thick and consisted of aluminium honeycomb covered with fibreglass sheeting. It was cut to size on the band saw.

The work was then rehoused in its frame in the standard way using mirror plates, and a wooden profile and backing board.

REFERENCES

1. St. John Moore, Felicity (Classical Modernism: The George Bell Circle. National Gallery of Victoria, 1992, pp20–22).
2. Personal communication, March 1993/par 3. Letter to Jane Clark (Curator, Australian Art), February 1991.

TREATMENT OF A PORTRAIT OF RICHARD EDWARD O'CONNOR BY ALFRED COFFEY

Peter Cousens

CONDITION

The painting arrived in the studio in a disastrous state. It was torn from the stretcher and ripped into several pieces of various sizes. The stretcher was smashed. Some parts of the painting remained tacked to the stretcher edge. The pieces of loose canvas had apparently then been crushed, resulting in large losses of paint along the creases. The edge of one of the smaller pieces appeared to have been burnt. A large portion in the lower right corner (which included the artists signature), and a smaller section along the left edge had been lost.

Before removing the painting from the dining room of the owner the face and hands of O'Connor were faced with lens tissue applied with Beva adhesive. The paint in these areas was very fragile and facing would enable safe transport to the studio. However, while the painting was stored ready for removal, it was abused, resulting in the damage described above. The applied facings made it possible to save and restore the painting. The frame was also damaged in several places.

The painting had been previously scheduled for restoration. It required cleaning, lining and repairs to the table in the lower left. The table area had been affected by moisture, possibly by incorrect cleaning with water, resulting in major loss of paint over time.

TREATMENT

All pieces of the canvas were removed from the stretcher, lightly sprayed with water and pressed gently with a heated iron. The creased pieces required extra moisture and pressing. The pieces were assembled to form a better view of the condition of the painting.

Each piece was now checked to see that the paint was securely bonded to the canvas. If the paint was seen to be loose, a weak application of Beva/white spirit was brushed onto the

reverse side and allowed to dry before pressing with a warm iron. The adhesive was carefully applied so as not to interfere with the torn edges. The threads of the edges were carefully teased and aligned in their correct positions before brushing with Vinamul heat-setting adhesive. The corresponding piece was similarly prepared before bringing it into contact with its neighbour. Vinamul was carefully applied to the torn edge, the alignment checked before bonding with a heated tacking iron. This procedure was followed until all pieces of the painting were reassembled. A photograph was taken of the reverse side of the linen to record the suppliers stamp, "Roman canvas (prepa) red by Winsor & Newton Limited England", for future reference. The excess adhesive and facing tissue were removed from the face and reverse of the canvas.

The painting was cleaned with a very weak solution of ammonium hydroxide as the unvarnished painting was not very soiled. Following cleaning, the painting was given a coating of retouching varnish which rectified the bloom problem in the dark robes.

INFILLING THE MISSING AREAS

Investigations began for suitable prepared canvases for the infill to the missing areas. My assistant Charles Cooper had inherited some art materials from Alfred Coffey's studio. Amazingly several portions of prepared material from the same roll as used by Coffey, were discovered. They matched perfectly. Unfortunately there was not enough old fabric to fill the missing areas. A new piece of cotton drill was selected, primed with gesso and when varnished proved to be suitable. The edges of the painting were neatly trimmed and an exact infill cut out using a sharp scalpel. The edges were prepared and pasted as described earlier, and joined.

LINING AND STRETCHING

The painting would normally be stretched at this point, but due to the serious damage this was not possible. It was thought that the two dimensional forces involved in the tensioning would pull the painting apart at the tears.

The back of the painting was given three coats of 20% Beva/white spirit and one coat of 40% Beva/white spirit.

A new piece of Belgium linen was pre shrunk on a temporary strainer. When both fabrics were ready, the original was lined using heated hand irons, pressed and weighted, and allowed to dry. The painting was checked for complete bonding. Any areas lacking complete adhesion were corrected. All excess adhesive was removed from the portrait which was now ready for the filling of all areas of missing paint.

FILLING AND INPAINTING

The painting was removed from the strainer and laid face up on the table and varnished with paraloid in preparation for filling. Several fillers were tested. The most suitable were, (1) a putty made from stand oil and whiting, and (2) acrylic gesso. The areas in the top right were filled with gesso. All other filling was done using the whiting/oil putty. This was easier to apply and allowed for later texturing of the surface. Unfortunately it was very difficult to see if the surface was properly levelled to the original until the colour was applied. At this stage the painting was fitted to a new cedar stretcher. A false lining was used for cosmetic reasons. The filler was again checked and corrected if necessary.

The filling was painted with water colours as a temporary measure to check the surface levelling. Many areas required additional filling and a lot of time was spent painting, checking and levelling. The inpainting was carried out using dry pigments and varnish medium. Several photographs were obtained by St. Johns College of R.E. O'Connor. These were most helpful and used as aids during the inpainting, especially for those areas which were missing or difficult to decipher. A great deal of time was spent on the inpainting.

The painting was given several coats of Ketone varnish and wax coatings before a final matt Ketone varnish.

FRAME REPAIRS AND GILDING

The frame was badly damaged, however enough moulding remained for casts to be made of each section. These were made and fitted. Several splits in the timber work of the frame were repaired with PVA adhesive and clamped. All other cracks were filled with plaster. The frame was painted with gold bronzing powder to match the original finish. The client decided that it would be better to have the frame gilded with Dutch Metal. The gilding was carried out by Gowrie Galleries in Bondi Junction.

The rebate of the frame was lined with felt to stop abrasion to the painting. The painting was returned to the frame and fastened with plates. A sheet of plexiglass was fitted to the back of the painting to protect it against falling dust and sandstone particles and also against moisture damage from the stone walls.

THREE PAINTINGS

Chris Payne
Senior Consultant, Paintings
Artlab Australia

This paper describes the treatment of three paintings undertaken at Artlab in the last couple of years. The first is one solution to the repair of badly slashed paintings while the other two are contrasting treatments.

"Roving in Thomas Town" by Trevor Nickolls was slashed and several pieces removed by the artist. He later regretted this action and asked Artlab to repair it.

The painting 152 x 213cm was an acrylic on commercially primed canvas on a stretcher frame, only about 1 year old. The slashes had allowed the tensioned canvas to relax and draw back, such that the edge of the major slash which linked areas of missing canvas no longer met by 1.5cm.

It was first thought that the slashes in the painting could be manipulated by taking the painting off its stretcher and realigning the slashed edges. However, this caused puckering and deformation at the ends of the damaged area.

It became apparent the slashes could only be realigned under the original tension. The work was replaced on its stretcher.

A model was made up to explore ways of drawing the slashed edges together. See illustration I. The first attempt was to stretch wetted paper from one edge of the tear to the back of a parallel side of the stretcher frame. Another piece of wetted paper was fixed to the other torn edge, through the tear and across the front of the painting, to a piece of wood fixed to the edge of the stretcher such that it protruded beyond the face of the painting. On drying it was found that the paper had not shrunk sufficiently to draw the edges of the tear together. Cotton cloth was substituted for the paper, but this was also unsatisfactory. Clearly a mechanical system to bring the edges together was required.

It was resolved to provide this by reversing the principles of the lateral tension frame. A piece of timber was screwed to the side edge of the vertical stretcher member nearest the tear such that its front edge was proud of the paint film by about 50mm. Corresponding bolt holes had been drilled through this and a smaller piece of timber, which I will call the tensioning bar. Long bolts with wing nuts were then fitted in the holes. Similar fittings were applied to the back of the vertical cross bar of the stretcher. A piece of polyester sailcloth was attached with strips of Beva film to the back of the painting, close to the edge of the tear, taken through the tear to the front of the painting and fastened to the tensioning bar.

Likewise a piece of polyester sailcloth was fastened to the opposite side of the tear and fastened to the tensioning bar on the cross member of the stretcher. By tightening these sailcloth pieces using the wing nuts the edges of the tear were drawn together by locally retensioning the artist's canvas without any distortions at the ends of the tears. See illustration II.

The painting was laid face down on the table with the tensioning bar assembly hanging over the side of the table. The angle of pull of the two tensioning bars caused horizontal non alignment which was simply corrected using weights. Windows were cut in the polyester pieces to gain access to the torn edges which were bridged with Stabiltex and epoxy resin. These bridges had to be quite large as the first ones tried popped off when the tensioning system relaxed.

Once all the bridges were in place, inserts were cut from identical canvas to fit the lost areas and the painting removed from its stretcher, lined with Beva film onto polyester canvas and restretched. The inserts were to be repainted by the artist at a later date.

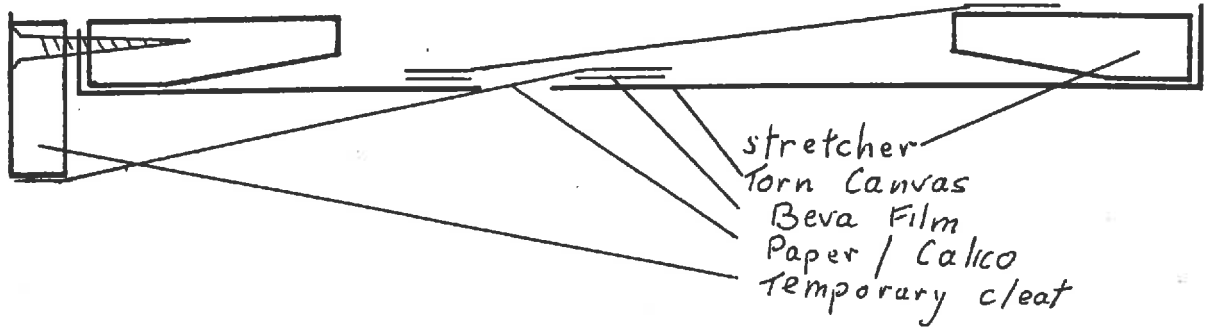


Illustration I

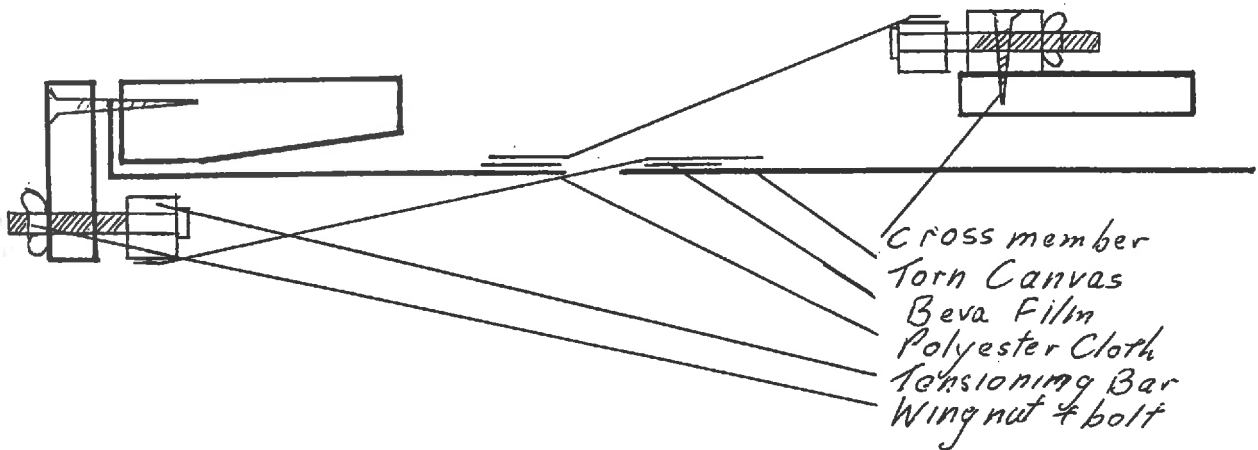
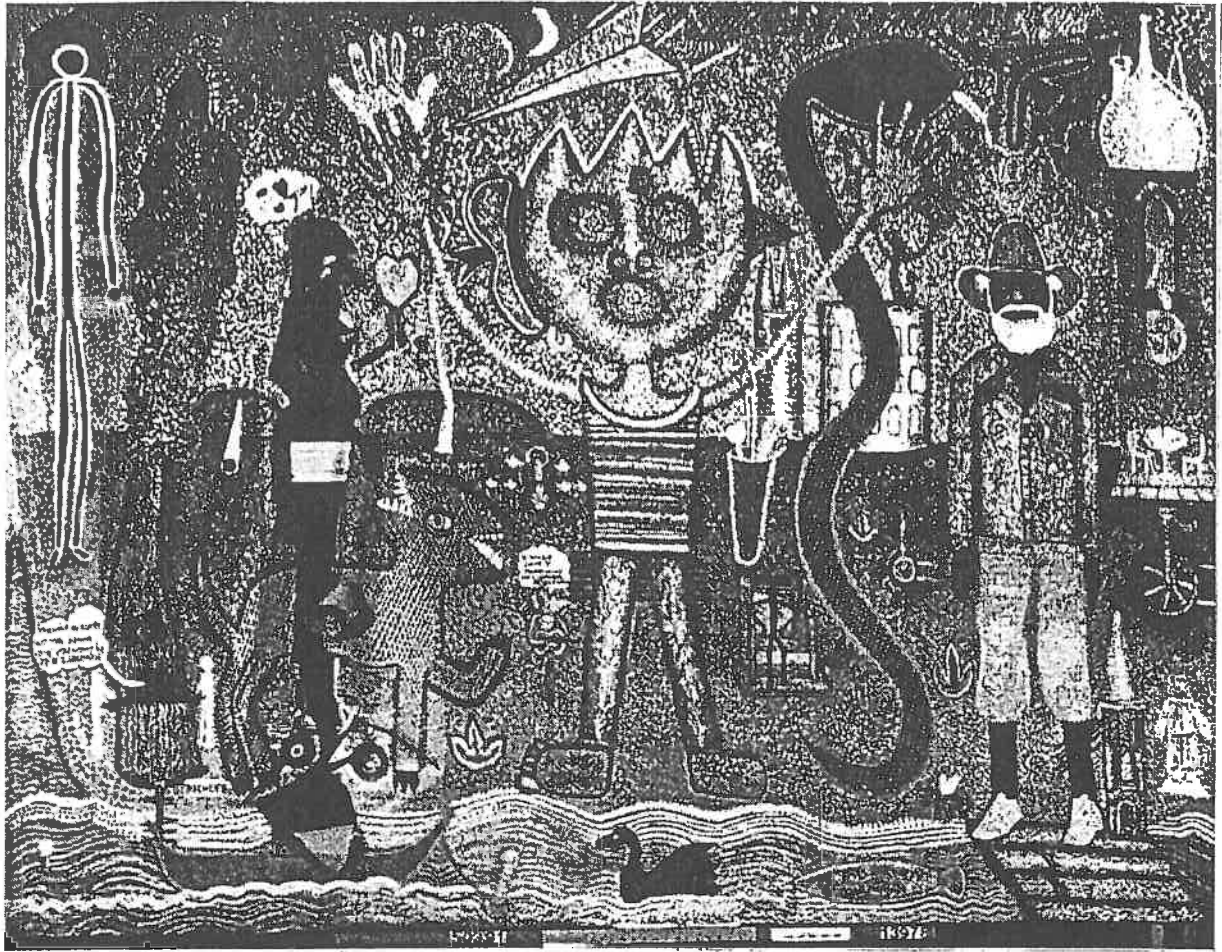
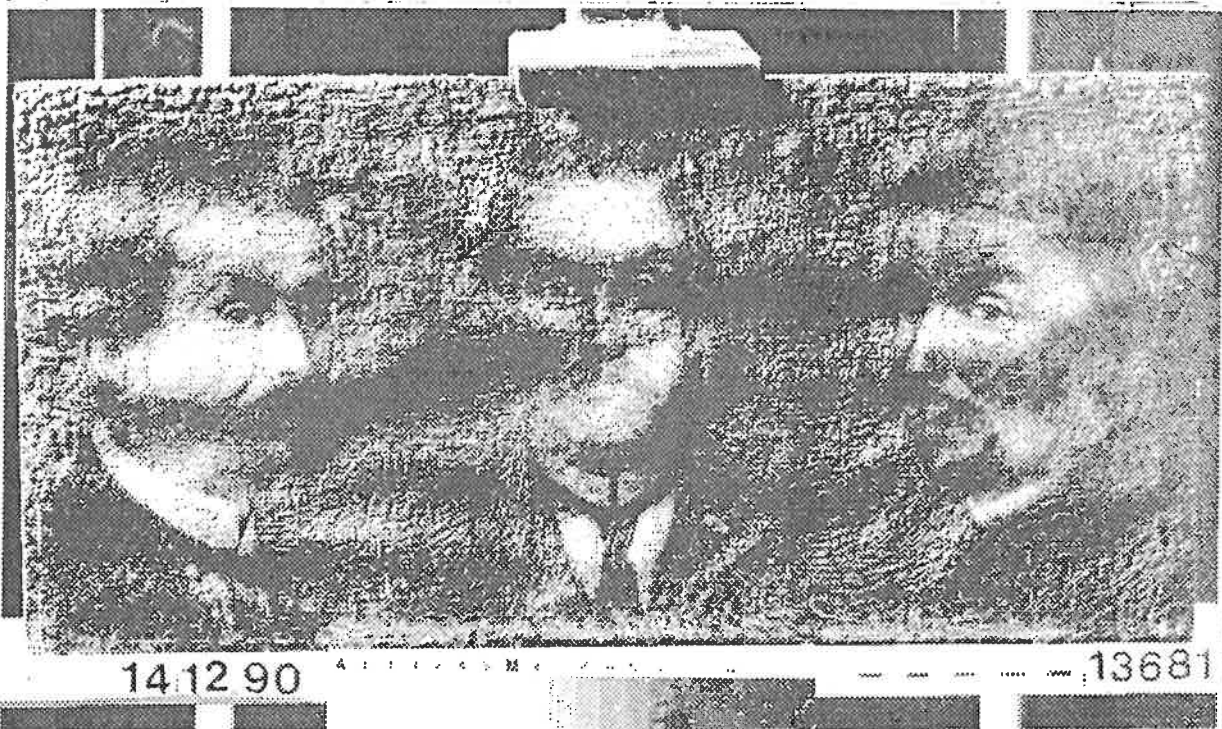


Illustration II



"Roving in Thomas Town" - Trevor Nicholls



"Self Portrait" - James Ferrles

The second painting is a triple self portrait by James Ferries, a turn of the century South Australian artist.

Originally a painting on canvas, it had at some stage been enlarged by the artist by tacking it to a wooden panel, closely around the edges, and haphazardly through the image. As there were no tacking margins (to extend the image) the artist painted on the bare wood. Paint was applied thickly, to build it up to the canvas level. The painting was heavily reworked to hide the tack heads.

In time the canvas had buckled badly by up to 6mm. The paint film had become dirty. When the owner had the frame restored the painting had been given a thick coat of textured varnish of the kind used in the trade to simulate brush work.

The owner brought the painting to Artlab with the instructions to have it cleaned and flattened. The new varnish was already quite hard. We removed it with equal parts of white spirit, ethanol and acetone applied by a brush. The varnish swelled into a stiff gel which was scraped off with a wooden stick. Quantity of solvent and timing were quite critical as the paint film was sensitive to this mixture.

Following this the painting was faced with Japanese tissue and starch paste, then the pre-washed linen and starch paste allowing a generous margin around the edge. Strips of Protectafoam were shaped to fill the troughs in the distorted canvas and were fastened into place with double-side tape. Once a flat surface was achieved the whole was fixed faced down onto a sheet of Fome-cor board, fastening it to the Fomecor by the facing margins with wax.

The removal of the backing was made difficult by the presence of the tacks. They prevented the use of power tools such as routers, planers and sanders. Fortunately the nails could be located as they had gone right through the panel and the points had been turned down. A dremel tool (like a small hand-held dental drill) fitted with a small circular saw head was used to cut the panel around the nails in the central image area. Saw cuts through the panel were then made around the perimeter but inside all the edge nails and taken down to the canvas

with chisel and stanley knife, enabling the central portion of the panel to be lifted out. The remaining wood around the edge was cut into short sections and pared down with chisels and scalpels. Several small pieces of the painting which had no canvas backing came away from the facing and these were numbered and stored for later reattachment.

The removal of the panel had revealed the artist's signature on the back of the canvas, so in consultation with the owner we changed plans. Originally an Aerolam support had been envisaged, but we substituted this for 6mm perspex. The tacks, because they had been painted over could not be removed so it was resolved to cut off their shafts protruding from the back using the dremel tool with diamond saw head. The canvas under the tack heads was depressed and out of plane with the surrounding area.

The painting was removed from its Fome-cor bed, humidified and flattened on the vacuum table. The facings were removed using moisture and the painting left under weights for several days. The perspex was cut to size, laid on the back of the painting and all the tacks marked on the perspex.

At each of these sites a dimple was carefully drilled in the perspex to accommodate the depression under the tack head.

The painting was then vacuum lined to the perspex using Beva film. The losses previously mentioned were reattached.

The last painting was an early colonial oil on canvas by John Lush entitled "Major O'Hallorans Expedition to the Coorong". The painting is important as a record of an historic incident as an early example of colonial artistic endeavours. To me the object was an artefact rather than just a painted image and a proposal was put to the Art Gallery of South Australia to treat the work accordingly. It was agreed to prepare the work for exhibition with the least possible interference to its overall structure.

The paint film was in good sound condition though very discoloured, while the support had a large T shaped tear in the top left corner and several small tears. Attachment to the stretcher

was quite good though there were some splits at the corners. There were several areas of severe local buckling of the support and image. The large tear had been clumsily patched with a piece of sprigged cotton dress fabric adhered with thick blobs of mucilage.

A damaged newspaper clipping printed 30 years after the event had been pasted to the back of the painting. It had not caused any distortion, but a large piece was in danger of being detached.

The painting was first cleaned. There seemed to be several layers involved though of similar make up. 3% ammonia was found most effective, suggesting greasy smoke deposits and possibly a thin coating of oil. This could account for heavier deposits lying in the hollows of the brush work. It was found that while the sky could be completely cleaned, prolonged exposure to cleaning put at risk shadows and a yellow/green colour in the landscape. It was resolved to partially clean down to what was considered the bottom layer of grime and discuss the result with curatorial staff. Unfortunately highly visible cleaning tests showed the possibilities of complete cleaning and that was their preferred action. They accepted a compromise when we cleaned the sky a little more and recoloured the cleaning test areas to match surrounding discolouration.

The cloth patch was removed using water where necessary to remove the mucilage. The amount of this offensive material left in the canvas can be reduced by dampening it then creating steam by applying a heated spatula over a blotter. This causes it to soften and come away on the blotter.

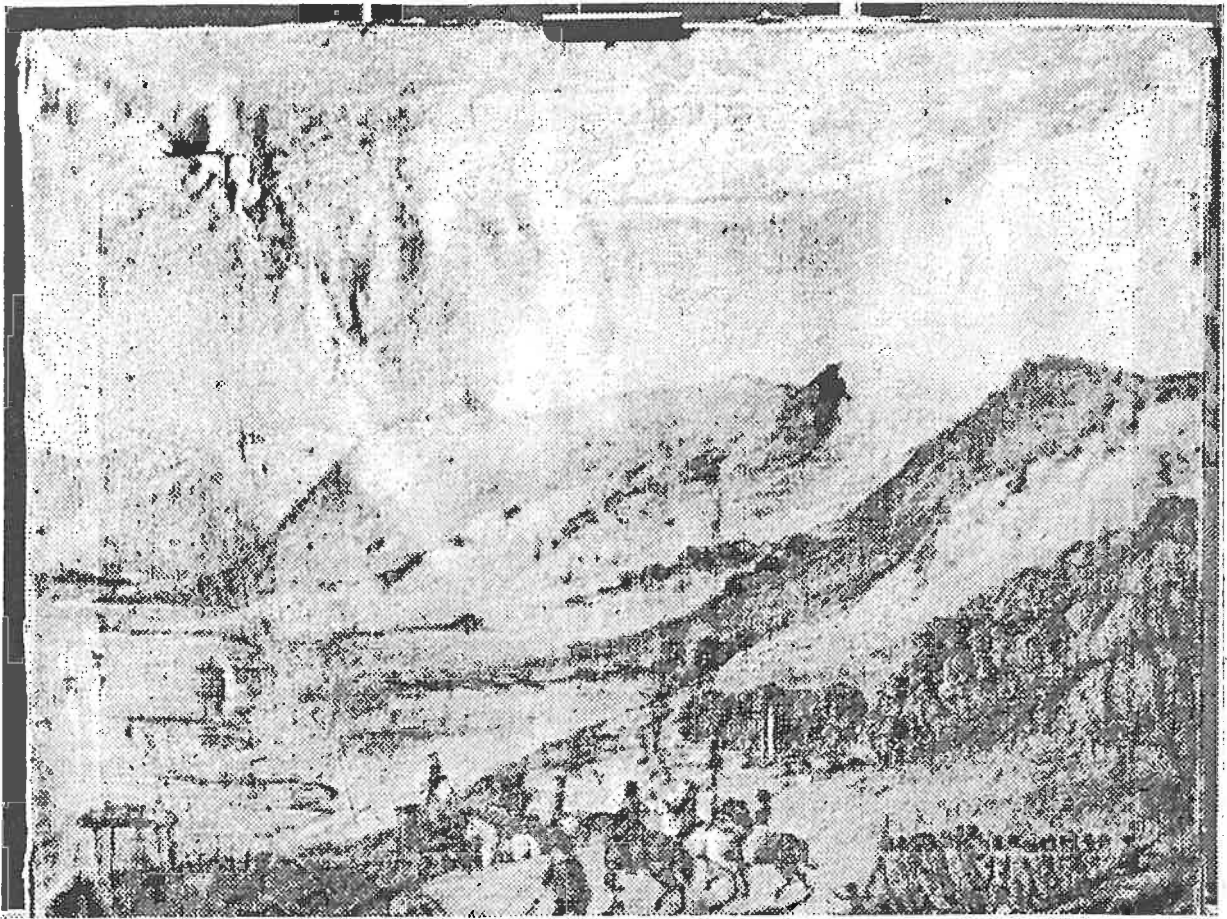
The loose part only of the news paper clipping was removed and with the cloth patch, was encapsulated and filed.

The cockling in the painting was very rigid and intractable. It was treated by artefact treatment of the paint film with a steam pencil followed by ironing with a spatula and several days under weights. This has proved fairly effective. The tears were then patched with Beva film and aeroplane linen.

Tacks in the tacking margin at damage sites were eased up and patches of the aeroplane

linen inserted underneath. Tacks were re-inserted at their old locations. Final cosmetic work consisted of filling and retouching the tears using pigments in Paraloid B67 and varnishing with a low gloss varnish of Paraloid B67 and microcrystalline wax.

I was very pleased with the final appearance of this painting. It did not have the pristine look of a recently conserved painting, but I felt its integrity as an artefact was almost undiminished. To me we achieved a good balance between minimum intervention, preservation requirements and aesthetic expectations, without the loss of historical information which may be required in future.



"Major O'Hallorans Expedition to the Coorong" - John Lush. Before Treatment



"Major O'Hallorans Expedition to the Coorong" - Reverse

THE AUTHENTICATION OF PANEL PAINTINGS BY TENIERS, JAN BRUEGHEL THE YOUNGER AND P. VAN DER VELDE

John Hook
Queensland Art Gallery

These three small works are part of a bequest of twelve paintings from the collection of Murray Prior which came into the collection of the Queensland Art Gallery in 1895. Most of these works appear to have been produced in Antwerp in the 17th century.

"The archery match" is painted on an oak panel and is signed 'D. Teniers fe 1645'. The painting required the removal of two varnish layers; the first being removed with a stoddard gel cleared with stoddard plus 20% xylene, the second with a solvent mixture of ethanol and stoddard. During cleaning, pentimenti of underdrawing became more visible under the clouds in the sky. The drawing looked quite 'pencil like'. Also the panel was rather thick and looked as if it had been prepared from a piece of (Victorian?) furniture and did not bear any guild stamp from the 17th century.

A sample was taken from the sky edge and was examined and analysed using the Scanning Electron Microscope and EDXA. The blue pigment used was cobalt blue and the ground had substantial amounts of barium sulphate; both 19th century pigments.

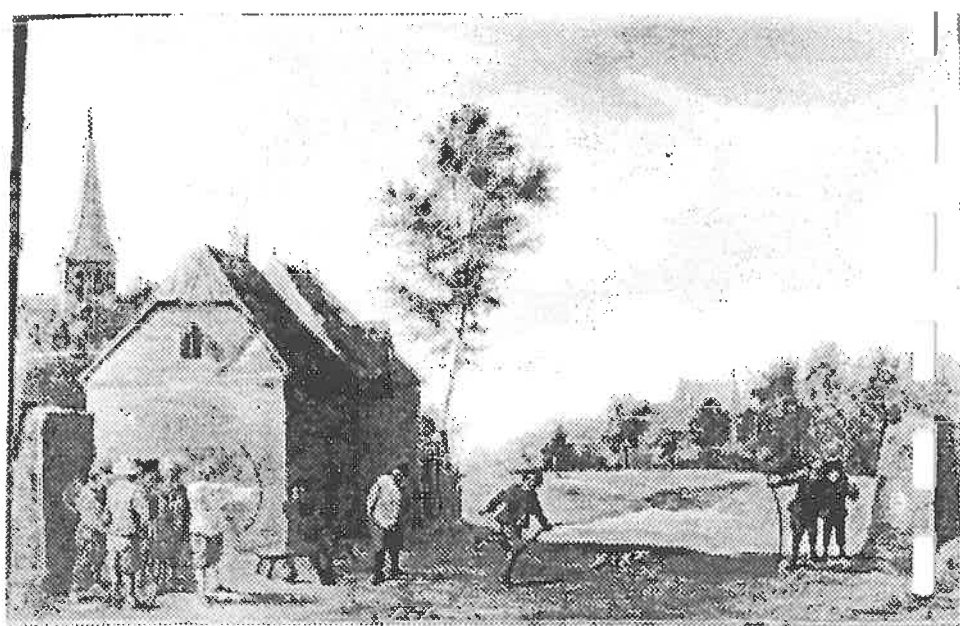
"The haven of refuge" is painted on a thick oak panel, is unsigned and the artist unknown. The painting had been scoured in the lower left corner and required substantial retouching. Whilst removing kraft paper adhered to the verso, a guild stamp with two hands and the Castle of Antwerp was discovered. Through correspondence with Bettina Jessel at the Art Restoration Centre in Washington, she suggested that she had worked on similar work by Pieter Van der Velde, who worked in Antwerp in the 17th century. Stylistic comparison with other works suggested that this work was by the hand of the artist. The 'checker board' lighting effects, silhouetted figures in the foreground, the Mediterranean seascape viewed at above horizon level and

treatment of the sea all suggest this.

A small genre painting of a fishing village entitled "The miraculous draft of fishes" was attributed to Bartholomeus Breenbergh. The panel had three oak battens screwed and adhered to the verso, which were replaced by sliding aluminium T-bars. During removal of the central batten a guild stamp was discovered; two hands and a castle (the St. Lucas guild of Antwerp). The work also contained a monogram 'J.B.' and was dated 1641 on the wall of the Inn painted in the midground. The background and still life detail were competently painted however the figures are rather squat and awkward, suggesting that the artist was not a figure specialist. In fact the painting was re-attributed to Jan Brueghel the Younger and is entitled "Christ calling the Disciple Peter". The composition developed after two collaborative paintings of "Fish market on river bank" 1640-41 where Jan Brueghel the Younger had painted the background and still life details and David Teniers had painted the figures. There followed three versions, landscape set pieces, of "Christ calling the Disciple Peter", solely by Brueghel, one version now in the Galleries Finck in Brussels, one in a private collection in Germany and the other in the collection of the Queensland Art Gallery. Indeed, upon translation of Brueghel's diary from that period, the three versions are mentioned.

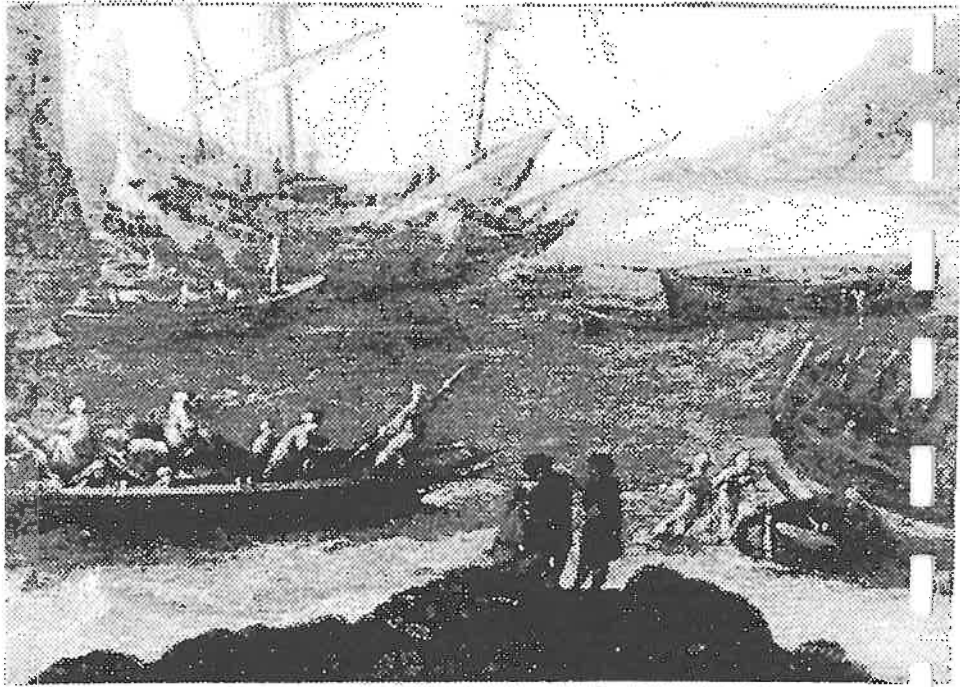
David Teniers

The Archery Match



Pieter Van der Velde

The Haven of Refuge



Jan Brueghel the Younger

Christ Calling the Disciple Peter



PACKING AND TRANSPORTATION OF BARK PAINTINGS FOR LOAN TO KYOTO

Colin Macgregor

INTRODUCTION

The National Museum of Modern Art in Kyoto borrowed 14 works from the Australian Museum's Australian Aboriginal Art collections for display in an exhibition entitled "Crossroads – Towards a New Reality" in September 1992. The works comprised of 10 bark paintings and 4 paintings on masonite. They were on display for 6 weeks in Kyoto and then 6 weeks in Tokyo.

The Materials Conservation Division took the opportunity to review our packing systems and design a crate based on our current knowledge of available materials. We also wished to test the efficiency of our design. The following criteria were considered the most important in the design.

1. To cushion the physical shocks of a journey.
2. To dampen the prolonged vibrations in transit.
3. To keep secure against casual theft.
4. To insulate the object from changes in temperature and relative humidity.
5. To allow easy packing and unpacking without risk to the object.

CRATE DESIGN AND LAYOUT

We discussed the design with Grace Fine Art who manufactured the crate. One large crate rather than 2 or 3 smaller crates was preferred. This encourages total handling with machinery such as forklifts instead of ad hoc heaving and pulling by hand which can result in rough treatment.

The 14 works were fitted into 10 plywood and pine trays with screw-down lids and two handles on the front edge for easy removal (see Fig.1). It was decided that the bark and masonite paintings should travel horizontally since their irregular shapes and lack of frames do not allow easy vertical mounting within the crate as with canvas paintings. Also the friable nature of the paint layer makes horizontal travel a preferable option. Most of the paintings had

been treated with consolidants in the past and were in a stable condition, except for two "Wandjina" figures from the Kimberly region. They had extremely delicate areas of white pigment which were treated with Plextol B500 to readhere flaking areas.

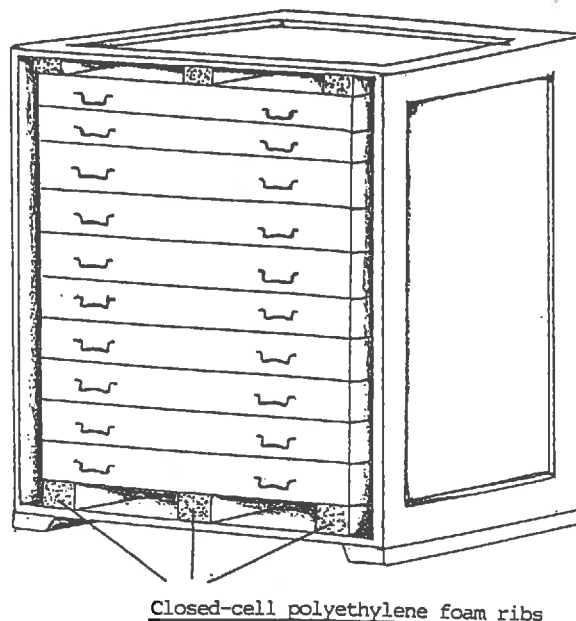


Fig 1.

DESIGN OF CLIMATE CONTROL

The outer crate walls were made from 12mm thick plywood reinforced with pine battens. The trays were constructed from 9mm plywood with solid pine fronts. The large surface area of unsealed pine and plywood on the outside of the trays was expected to buffer changes in the relative humidity (R.H.) in the small airspace between the trays and crate walls. The internal surfaces of the crate and the trays were lined with waxed Sisalcraft paper which acts as a moisture barrier and limits emissions from the wood (although this a minor issue over short periods for these artefacts). The side-opening lid of the crate and the lids of the trays were fitted with rubber seals.

The crate was allowed to acclimatise to 55% R.H. for two weeks in the museum anthropology stores before loading.

DESIGN OF SHOCK ABSORPTION

In the packaging industry, the force of an impact is measured in G's. The force exerted on an object as it suddenly decelerates to a standstill can be over 100G's without cushioning (i.e. it is subjected to over 100 times the force of gravity). For delicate museum artefacts, we aim to avoid deceleration of greater than 20G's, as recommended by Piechota¹. In order to get the best cushioning from a packing foam, it is necessary to load it correctly. If it is overloaded the contents will overcompress the foam and "bottom-out" when subjected to a sudden shock. If it is underloaded the foam will not compress sufficiently and most of the shock will be directly transmitted to the contents of the crate. It is therefore necessary to estimate the most likely levels of impact that the crate will sustain by selecting the most likely drop height. This depends on its size and mode of travel.

The Australian Museum uses a closed-cell polyethylene foam known as Ethafoam 220

for many storage and packaging applications. It is suitable for many uses because it is firm, durable, easily carved to various shapes and is chemically inert. For packaging, an added advantage is the availability of detailed technical specifications of its loading characteristics². We have been unable to obtain comparable data for polyurethane foams, so far and are conducting our own drop tests to determine the optimum loadings for various soft foams.

From the deceleration-load curve for Ethafoam 220 (see Fig.2), it can be seen that the lowest deceleration from an 18 inch (450mm) drop occurs at a loading of between 0.8 and 1.0 lb/in² (56-70 grams/cm²). This meant that, even with a mass of 190 kgs. of trays and paintings, there should only be a surface area of 0.274m² of foam taking the load. This was laid out as 3 ribs of 830mm x 110mm running across the base of the crate. A thickness of 100mm was chosen for the foam ribs on the base and 50mm on the sides and top.

Deceleration — ETHAFOAM 220 (2.2 PCF)

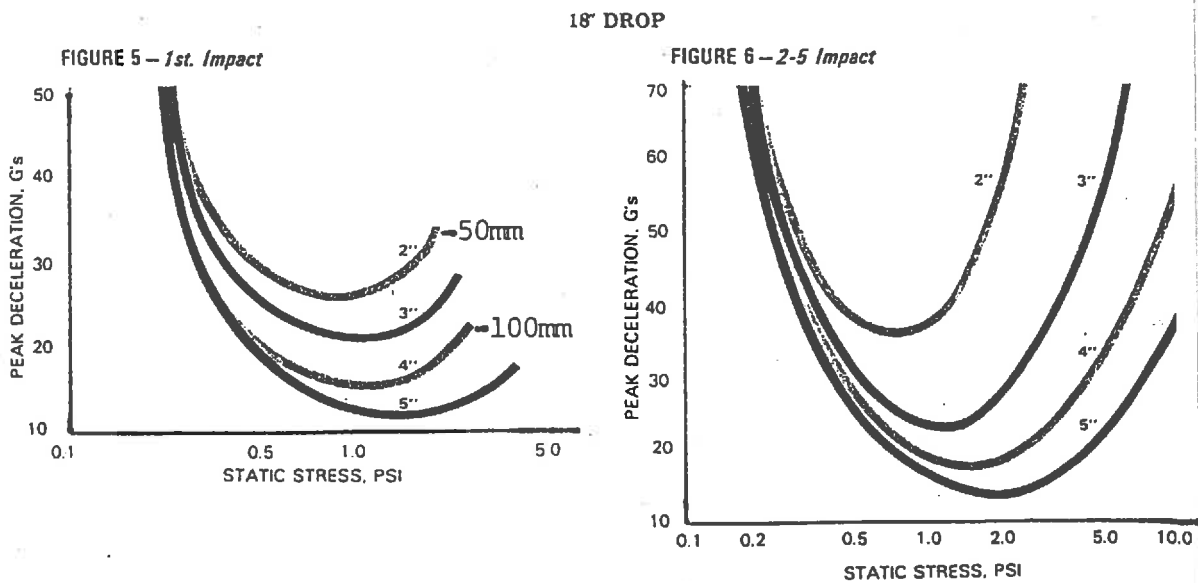


Figure 2

INTERNAL FITTING OUT OF TRAYS

The insides of the trays were filled with Ethafoam with a cutout which followed the outline of each work. Recesses were cut for hands to get beneath the barks to pick them up. The edges of the cut-out were lined with Tapex which is a very smooth 2mm thick polyethylene foam sheet. The barks rested on contoured ribs of Ethafoam which were covered with a 25mm thick layer of Dunlop's softest polyurethane foam which should reduce the transmission of vibration to the work. The contours of the back of the bark was matched on the foam ribs by placing a "Flexicurve" on the back of the bark backing to model the shape. Flexicurves are flexible lengths of plastic-coated metal obtainable from most arts suppliers.

The lids of the trays were fitted with soft polyurethane foam shaped to the size of the work and covered with 50 μ polyethylene sheeting to prevent friction with the paint surface. In this way the works were prevented from moving upwards on impact, while receiving minimal pressure on the front surface when at rest. Cut-outs were made in the foam above the head areas of the "Wandjina" figures so that there was no contact with the most delicate areas of flaking paint.

This tray system has the advantage that the works can be safely removed and replaced with minimal instruction as soon as the lid is removed. However, future designs may have to incorporate a method of retaining the works from below when the entire paint surface is too friable to sustain any pressure safely. One of the works on masonite did deposit some powdery brown pigment, which contained little binder, on the lid padding. Great care must, therefore, be taken when identifying safe contact points on this type of painted surface.

MONITORING THE SHOCK ABSORPTION

The efficiency of the cushioning system was monitored by attaching "Shockwatch" devices inside a tray, on the back of a bark painting, on the outside of a tray and 2 on the outside of the crate. These are low cost devices which are triggered at above a certain level of impact.³ We used devices which have three settings to

indicate impacts above 25, 50 and 100G. An indicator strip turns red when the device is triggered. Neither of the external Shockwatches were triggered on the trip indicating that it was very well handled. Unfortunately, this means that nothing can be deduced about the effectiveness of the cushioning since none of the devices were triggered. Further testing on the empty crate by dropping it to achieve a 100G impact on the outside would allow us to see if the 25G sensors on the inside were triggered, thus indicating an effective packing system.

MONITORING CLIMATE WITHIN THE CRATE

The Australian Museum has recently acquired 2 ACR Dataloggers for measuring temperature and relative humidity. It was therefore decided to take the opportunity to monitor the conditions within the crate and its response to variations in the external conditions. The conditions varied dramatically during the journeys as it was travelling to the separate hemispheres where the seasons were reversed. This was particularly true on the return journey where the crate was travelling from midwinter in Tokyo to midsummer in Sydney.

On both legs of the journey the crate was subjected to large changes of temperature and R.H.. The outward journey involved a 24 hour stop-over in Hong Kong which resulted the temperature rising from 16°C to 28°C and R.H. rising dramatically from the extremely dry conditions in the aircraft to high humidity on the ground. Within the crate the temperature rose steadily over a number of hours to equilibrate with the external conditions whereas the R.H. remained constantly within the 50-55% range.

On the return journey from Tokyo to Sydney, the temperature as monitored outside the crate (See fig.3) varied from 6°C to 35°C. The external relative humidity varied between 7% in the aircraft and 83% just after a thunderstorm on arrival in Sydney. It is interesting to observe just how dry the conditions are during flight at high altitude due to the external air being warmed from -40°C up to 23°C in the aircraft.⁴ The aircraft for the return journey was a passenger Boeing 747 and the external datalogger was carried in the passenger cabin. The flight deck

crew confirmed from their instruments that the temperature in the middle hold was only 2°C cooler than the passenger cabin but otherwise the conditions would be the same.

Despite these extremes of external relative humidity, the conditions within the crate were constantly between 50 and 55% (see fig.4).

The temperature fluctuated between 11°C and 24°C within the crate during the journey. The crate appears to have an excellent internal buffer against R.H. changes. This is probably due to the plywood and pine in the crate, but tests should be carried out on the empty crate to establish that the bark and masonite were not contributing as moisture reservoirs.

Tokyo to Sydney - outside crate

09:00 23/12/92 to 13:30 24/12/92

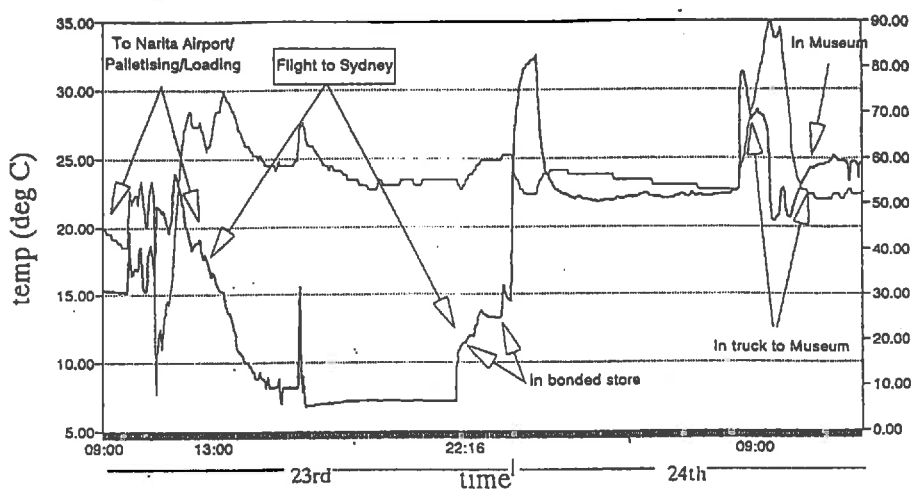


Fig 3.

— temp — RH

Tokyo to Sydney - inside crate

00:16 21/12/92 to 08:49 24/12/92

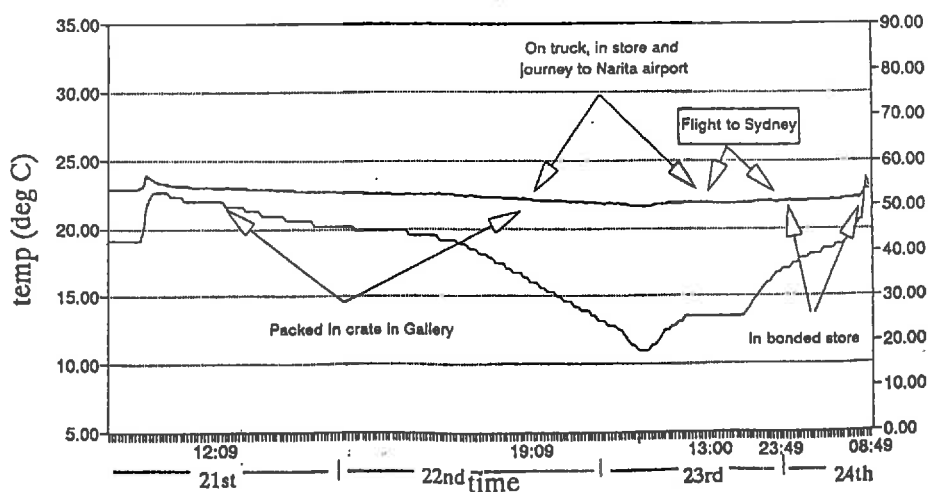


Fig 4.

CONCLUSIONS

1. The crate is very well buffered against changes in external relative humidity.
2. Despite the two levels of seals and the Ethafoam surrounding the paintings, the crate responds quite rapidly to changes in external temperature.
3. In this type of crate, floating the entire contents of the crate on a strong foam is an easier way of achieving correct loading characteristics for the cushioning system than trying to fit correctly loaded shock protection around individual works.

FUTURE WORK

1. Further tests will be carried out to determine whether the excellent R.H. buffering was due to the double skin of crate wall and tray walls by placing a datalogger in the airgap between the crate and trays, and subjecting the crate to changes in R.H. The trays should also be tested empty to confirm that the works themselves were not contributing significantly as R.H. buffers.
2. Methods of improving the thermal insulation of the crate should be examined⁵.
3. Drops tests will be carried out to check accuracy of loading on the P.E. foam using accelerometers inside and outside crate.
4. Methods of restraining bark paintings without any contact on painted surfaces should be examined.

ACKNOWLEDGEMENTS

I am very grateful to Mike Kelly, Graeme Scott and David Horton-James for all their work on the project and assistance in preparing this paper.

REFERENCES

1. Piechota, D., "Packing Anthropological Collections for Transit", **Symposium 86, C.C.I.**, 1986
2. Dow Chemical USA, "Protective Packaging with ETHAFOAM", Midland, Michigan, 1975
3. Staniforth, S., "Packing: A Case Study", **National Gallery Technical Bulletin**, Vol.8, 1984

4. Saunders, D., "Temperature and Relative Humidity Conditions Encountered in Transportation", **Art In Transit**, Washington, 1991

5. Stephenson-Wright, A. & White, R. "Packing: An Updated Design, Reviewed and Tested", **National Gallery Technical Bulletin**, Vol.11, 1987

Materials

ACR Dataloggers – Manufactured by ACR Systems Inc., Surrey, BC, Canada
Available from – Teclec Controls, 48 Koala Road, Greenacre, NSW 2190

Ethafoam 220 – Available – from Dunlop Flexible Foams, PO Box 91 Smithfield, NSW 2164

Shockwatches – Available from Magnetic Labs. 453 Willoughby Rd., Willoughby, NSW 2068

RESTRETCHING: PROCEED WITH CARE

Chris Payne
Senior Consultant, Paintings
Artlab, Australia

This paper looks at the redistribution of tensions within a painting on canvas when it is subjected to common conservation treatments. It is by no means an exhaustive study on the subject and I would like to see someone examine the topic further.

We have a strangely ambivalent attitude toward the fabric component of a painting. Whilst we recognize that canvas is inherently unstable and causes many problems we are never the less obsessed with treating the paint film. On the other hand if a painting has stubborn corner draws or cockles we talk of flattening the canvas as though the paint film was not part of the problem. In spite of the fact that it has long been recognized that the support causes most of a painting's structural problems, the treatment of supports is seen as basic artisan type work, not in the same league as cleaning and retouching, which are really in most cases only cosmetic treatments.

Examination, treatment technique and understanding of paint films have come a long way in recent years. However, our ideas on what a support is and does has remained pretty well static. I know there has been some work on stretched canvasses though I admit I haven't had time to look up all of the references.

The longer I work with paintings the more I have come to realize that:-

- (1) we must take a holistic view of treatments
- (2) we must do the least possible, recognizing that our treatments may have a destabilizing effect and also that a better solution may be found in the future. How often have our treatments been made more difficult by earlier treatments?

We should also be aware of how easily we can get caught up with fashion – for example, in the

past many conservators promoted routine lining for all works that came to their lab as a preventative measure. More recently the fashion has changed to routine strip-linings.

Minimum intervention has become quite a buzz word, but who really practices it? What is the balance between a less than perfect appearance and completely original condition? How many of us attempt to estimate how long an artwork can remain in its present condition before intervention is essential? When we are treating an object do we assess the remaining life span of its various parts, recognizing some aspects do not need immediate treatment and deferring the same to a date perhaps 10–20 years hence? Unfortunately we usually go for a "king hit" treatment and give the painting "the works" while it is in the lab.

I have become increasingly concerned at the effects that the process of conservation treatments have on the stability of paintings on canvas, especially in the long term development of crackle patterns.

Everyone is agreed that a painting must be kept under tension to avoid all types of cracking and premature ageing problems. (Though exactly what is the optimum tension is undetermined.)

However, we routinely take a canvas off its stretcher and leave it loose on a work surface, perhaps for months. Treatments may involve covering parts of it with weighted impervious material during fluctuating environmental conditions. Remember, no one has perfect air conditioning.

All this is stressful enough, but then the painting is reattached to a stretcher, usually via a strip-lining without any reference to the painting's original attachment points. This brings me to the central theme of my paper.

When a canvas is fastened and tensioned onto a stretcher there are areas of localized stress radiating from each fastening point which gradually merge and equalize towards the centre of the canvas.

Before we go any further we should recognize that there are two types of stretched canvas systems to be considered:-

- (1) Artist stretched and primed canvas.
- (2) Pre-primed or commercially primed canvas.

We have all seen the wavy appearance given to the weave of a canvas that has been stretched and primed by the artist. Observation suggests the system can be quite stable, the raw canvas being able to adjust and accommodate the stress to a large degree while the priming and paint layers have been applied after some measure of equilibrium has been reached. The sizing and priming also help lock the canvas fibres into this set position thus further improving stability.

However, should the painting be removed from its stretcher and later reattached at different points the whole system is destabilized. Areas that were without tension are stressed. Can we show this to be more than just a hypothesis?

I decided to construct models of stretched canvasses to show these effects. After some experimentation I found the most graphic illustrations were given by cotton canvas stretched on 450mm sq stretchers and primed with a thin gesso made from whiting and 3% animal glue. This gives a delicate, brittle surface which translates stress into cracks quite readily.

The canvas was stretched and gesso primed. It was keyed out before the gesso dried to give a good final tension. The canvas was then removed from its stretcher and restretched using attachment points between the original ones. On retensioning, cracks appeared. (See *illustration 1*)

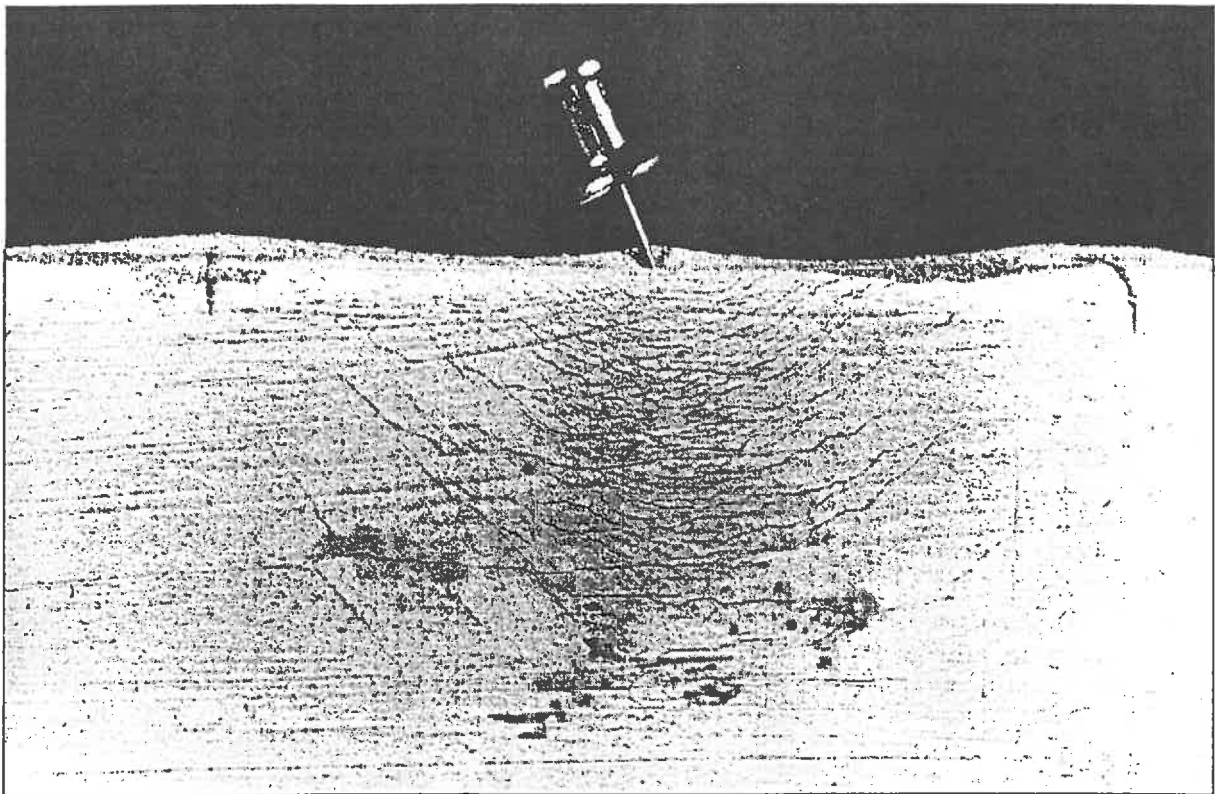


Illustration 1

They very clearly indicate we have created a new pattern of tensions within the system.

There was some difficulty photographing these cracks for slides. They are not easy to see in ordinary incident light. A better result was obtained with transmitted light using an optical fibre microscope lamp to get illumination between the back of the canvas and the stretcher.

Staining the back of the canvas was then tried. Aqueous stains were ruled out as they were strongly absorbed by the gesso.

A stain made up of oil paint (Alizarin Crimson) and Paraloid B67 varnish was applied to the back of the canvas after the stretcher was removed. This bled through the cracks and showed them very effectively. This technique might be improved by the use of deep, sharply bevelled stretchers that allowed the stain to be sprayed in without disturbing the canvas on the stretcher. Varnish viscosity is also important. If too thin the colour soaks through the gesso rather than the cracks.

Pre-primed canvasses were then examined.

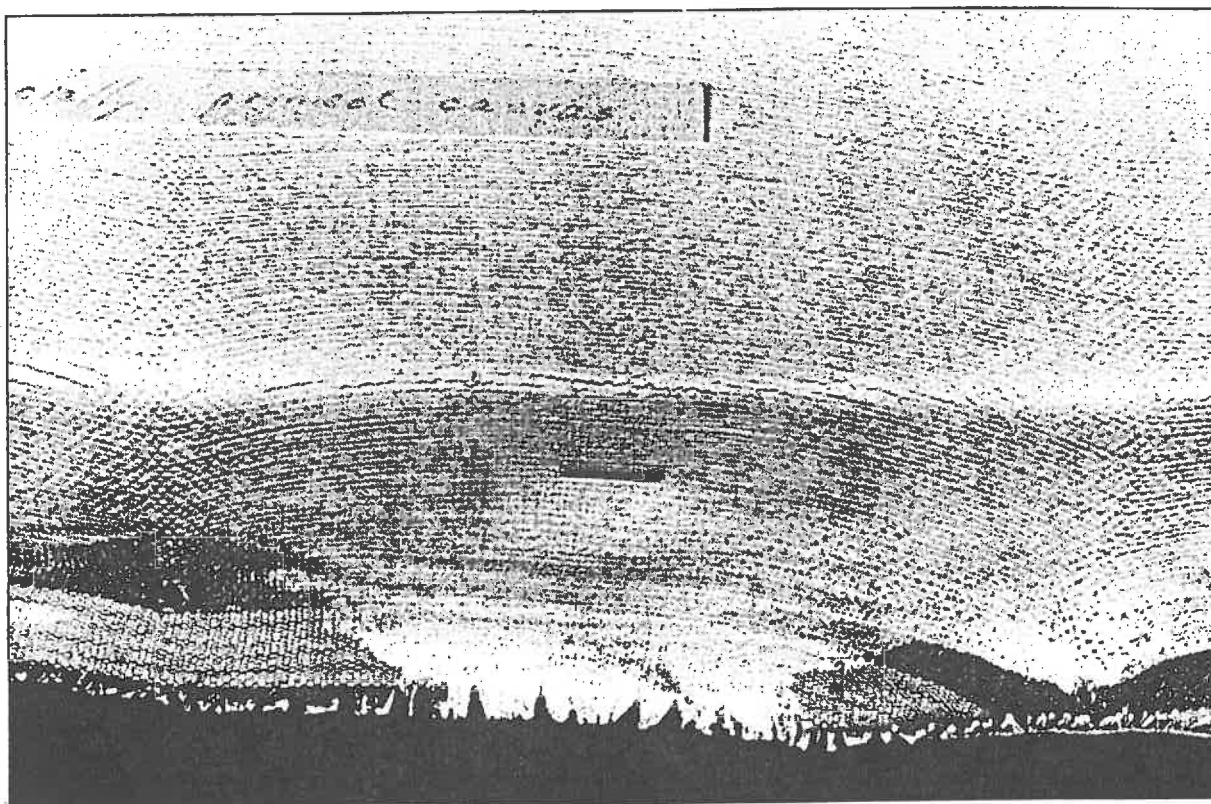


Illustration II

Illustration II shows a piece of commercially prepared canvas with an acrylic priming. The original fastening points from the priming loom can be seen on the tacking margin. It has been refastened to the stretcher between these points and one can clearly see the result of putting a previously relaxed zone under tension. As acrylic primings have some elasticity, one may conjecture how far into the

canvas this tension may extend and whether it will give rise to cracking in the future as the system ages.

To illustrate the problem more graphically, another model was prepared. A piece of canvas was pinned out on a board and primed with gesso. A dry piece was cut from this, attached to a stretcher and tensioned. Cracks

showing the new stress patterns were the result. Cracks similar to these can be seen in some aged paintings and are known as tacking garlands. This represents the tensioned state of most paintings. The cracks were stained red as in the first case. The canvas was then reattached to the stretcher at points between the original fastening points and retensioned. A second series of cracks was the result. The first set of cracks were located by pen marks and the second set by push pin. (See illustration III.) Obviously these dramatic crack patterns do not mean all restretched painting are going to immediately develop new tacking garlands. There are many factors which will influence the transmission of these new stresses, especially the age and the precise makeup of the artwork.

Newer paint films and canvas will allow some dispersion of stress through plastic deformation while old canvasses and paint films have become rigid and brittle. Tightly woven, pre-washed linen canvasses have less give than loosely woven cotton canvasses.

The type of strip-lining and method of attachment will also make a difference. A heavy strip-lining secured at short intervals to the stretcher will spread tension evenly but over previously stressed and unstressed areas alike.

I am quite convinced that removing a painting from its stretcher and later reattaching it with or without a strip-lining has the potential to accelerate and change age crackle patterns.

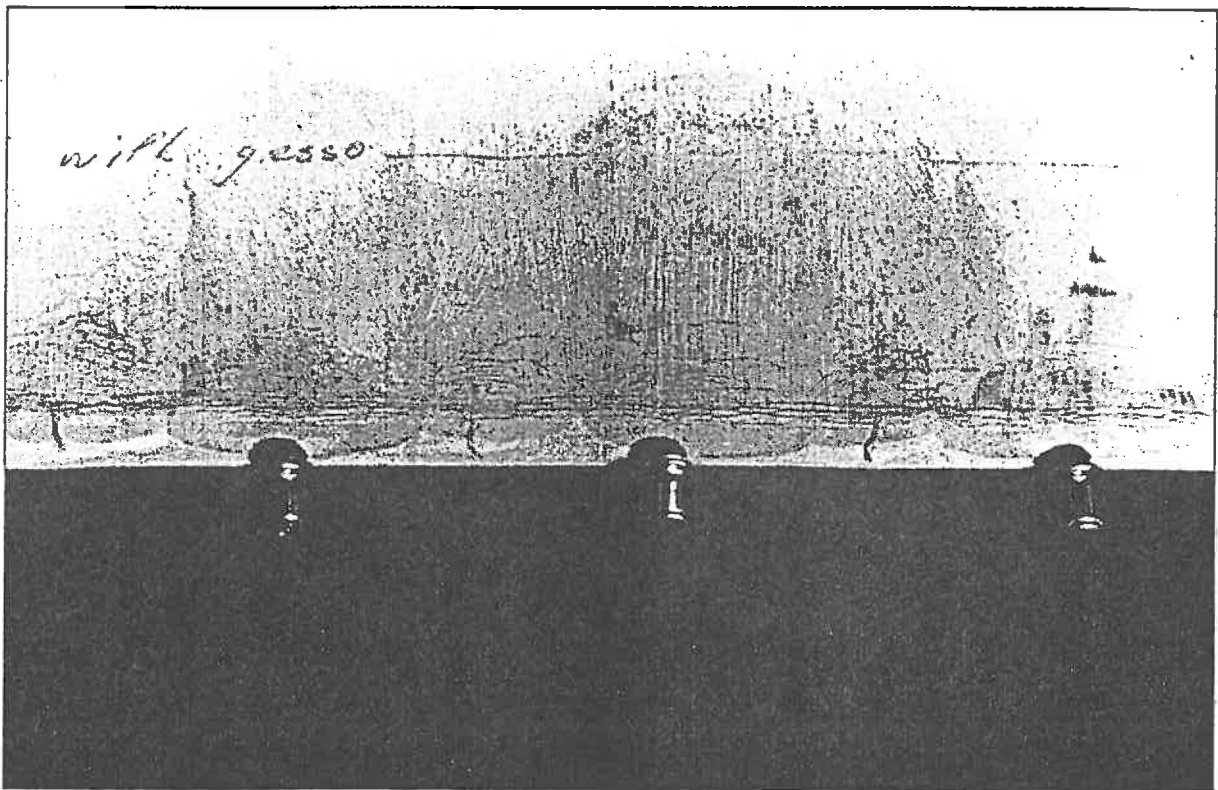


Illustration III

I believe we need to review some practices. For example, the presence of stretcher bar cracks is often taken to indicate the stretcher has an inadequate bevel. So the painting is taken off, perhaps strip-lined and given a new stretcher. Yet I have seen these cracks on small paintings with the stretcher joints closed,

ie never keyed out, and with good tension. It is unlikely the canvas had ever been loose enough to flop against the stretcher.

A more likely cause of the cracks is the difference in microclimate in the area between the canvas and the stretcher and of the

uncovered canvas. The timber in the stretcher acts as a humidity bank thus greatly reducing the rate of dimensional change in the canvas in its immediate vicinity, whilst the uncovered areas of canvas rapidly respond to environmental change. The stress between these two zones creates the stretcher crack. A backboard and correct tensioning may be the only required correctional treatment.

A crack is the resolution of stress. Once a pattern of stretcher cracks has been established there is little point replacing the stretcher unless there are other reasons making it inadequate.

Stretchers are frequently replaced when the joints have been keyed out to a certain degree, often as little as 4 or 5mm. Yet the strength of a stretcher joint is not seriously affected until it is opened out to about 20% of the width of the timber used, so a stretcher could be keyed out in excess of 10mm quite safely.

We are also obsessed with flat. Perhaps we should be more tolerant of minor planar distortions such as corner draws and uneven surfaces which sometimes have been created during the original stretching. Certainly many of these distortions are of very long standing and it is the paint film and ground rather than the canvas which makes them so rigid.

Usually the painting is taken off its stretcher and flattened using combinations of heat, moisture and pressure. The paint film could be cracked and/or restressed doing this especially if it has not been pre-softened by humidification. Might it not be better to convince owners/curators to tolerate these imperfections.

Paintings are often taken from their stretchers to clean the back, especially the bottom edge. I would recommend a review of this treatment. Sometimes it is unavoidable, other times cleaning with a crank handled spatula is sufficient and perhaps immediate localized stress is preferable to indeterminate long term problems. Partial removal from the stretcher may be an option. This is also a satisfactory way of repairing the tacking margins where tacks pull through or the turn over has split.

The tests I have carried out indicate we could be doing long term damage to artworks we treat. We are also destroying a painting's integrity as an artifact. Particularly where the painting is in original condition.

We can minimize potential damage by reducing the number of works we take off stretchers and by reattaching those we do remove at the same points at which they were attached originally.

AN INVESTIGATION INTO THE PROPERTIES OF SIZED LINEN CANVAS

Sally Outhwaite

INTRODUCTION

The purpose of this investigation was to compare the behaviour of rabbitskin glue with a number of selected synthetic materials that are relatively stable with changes in humidity. Traditionally, rabbitskin glue has been used to size linen canvas in order to stiffen it. However rabbitskin glue changes in stiffness with respect to moisture absorption and desorption (Mecklenburg, 1982).

Typically, previous attempts to reduce cupping and cracking in paintings have involved attaching them to a stiffer support. Lining has been common practice for the past two centuries. The stiffer secondary support is put under tension, rather than the painting canvas, thereby reducing stress in the original support. However a large number of glue linings are still carried out, and glue has continued to be used to stiffen linen.

This project was carried out during the author's final year at the Courtauld Institute, London.

MATERIALS AND METHODS

The sizes tested were rabbitskin glue, Paraloid B72 – an ethyl acrylate/methyl methacrylate co-polymer, and three dispersions with a range of physical properties. Two were acrylic dispersions; Plextol B500 (a terpolymer of ethylacrylate, methyl methacrylate and ethyl methacrylate), and Primal AC 507K (a co-polymer of n-butyl methacrylate and methyl acrylate). The third dispersion used was Vinamul 3252, an ethylene vinyl acetate copolymer.

Three different weights of linen, all plain weave were used, a Superfine Artist's linen, a fine artist's linen and a 12oz Flax canvas. These are referred to respectively as fine, medium weight and coarse.

The synthetic material tested was a Carrington Viyella medium weight multifilament plain weave polyester of weight 204g/m that is

commonly used at the Courtauld Institute as a lining material, identified in this paper by an old trade name, Permawear. It was unlikely that Permawear would ever deliberately be glue sized, only the linen samples were coated with rabbitskin glue.

PREPARATION OF THE SAMPLES

The size applied by the manufacturers to canvas to facilitate the weaving of the material was removed by washing it in mild detergent solution. After it had dried the canvas was stretched over wooden frames, sprayed with water and left for twenty four hours to dry. This process was repeated.

Two coats of each size were applied to one side of the fabric. 10% dry weight rabbitskin glue was added to water and left overnight. The following day the solution was gently heated. The material that would not dissolve was removed by filtration. The glue was applied to the canvas in solution, warm and was brushed on.

Two coats of Paraloid B-72 15% w/v in xylene were applied to the surface using a brush. The dispersions were thinly and evenly applied using a knife to spread them, this was done empirically. The first coat was allowed to dry overnight before the second coat was applied. 1% Rohagit SD15, (a polymethacrylic dispersion) was added to the Plextol B-500 to thicken the dispersion and so make it easier to manipulate across the surface of the linen.

AGEING

The ageing of selected samples comprised of 83 days sunlight ageing between August 1st and October 22nd on a south facing roof of the Courtauld Institute, followed by 25 days of thermal ageing at 85 degrees centigrade, 52% Relative Humidity in the Fison's oven at the Tate Gallery, London.

METHOD FOR STIFFNESS TESTING

An Instron tensile testing machine was used to measure the stiffness of the samples. It is a dual system instrument comprising of the load weighing and recorder system, and the crosshead control. The crosshead moves up and down side columns at a fixed rate, controlled by change gears. The sample was held by two grips, the lower fixed to the base and the upper grip attached to the crosshead carrying the load cell.

A humidity chamber was constructed around the tensile testing machine in order to monitor and provide a degree of control on the relative humidity and the temperature when testing.

A maximum of 5 stiffness tests were run for each sample and the two closest results were plotted. The graphs were plotted with % elongation on the horizontal scale and Kg/Force for the vertical. Kg is not the measurement for force, but the load was considered to have a direction as the crosshead moved up.

The load measurements experienced by the samples were not translated into stress values because of the indeterminate nature of the cross-sectional area. The gradient value is not the real value for Young's modulus, however as the results are comparative this was sufficient information in the context of the present evaluation.

One of the limitations of the project was that in the available time it was not possible to exceed loads of 20Kg. Therefore the test range did not extend beyond the second zone, the decrimping zone. However the stresses experienced by a painting are unlikely to be in this high-load region. The results are therefore concentrated on two zones, the initial zone of high modulus and subsequent zone, known as the decrimping zone. The stress/strain response of the sized materials was not investigated at very small loads so that when the results were converted into graphs the lines were not connected to the origin.

THE MECHANICAL PROPERTIES OF LINEN

In order to be able to understand the significance of the results it is necessary to

have an understanding of the mechanical properties of linen.

Hedley devised a generalised load/strain curve for woven materials, (Fig 1). As with the stress/strain curve of a metal defined regions are apparent, but the shape of the curve is different. At low loads the initial modulus of the woven material is high because the yarns are held in position by virtue of being woven together and resist being stretched.

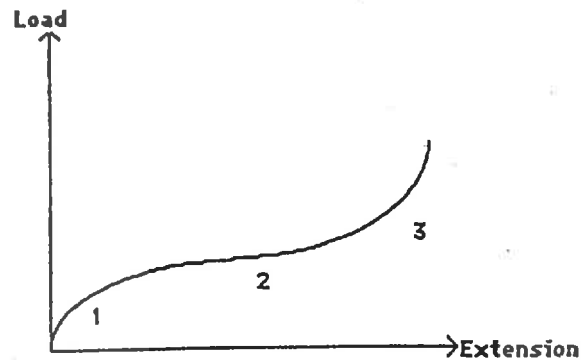


Fig.1 The Load/Strain curve for a fabric

In the second region the gradient is less, the initial resistance overcome and the yarns of the material are being decrimped. Crimp is the natural wave of the yarn. Crimp transfer between the warp and weft yarns occurs if strain is applied to one direction and not the other.

After the crimp is removed the yarns of the fabric begin to extend. It is from this third region that the modulus or stiffness of the material is calculated.

The significance of Young's modulus in relation to a lining canvas becomes evident by following Hedley's argument. Young's modulus describes the ratio between the stress (force per unit area) applied to a material and the strain, (the elongation) which results. In Fig 2 the painting canvas (PC) has been given one value of Young's modulus. In reality each paint and ground layer has an individual value. The lining fabric (L) is stiffer than the painting canvas. The lining fabric needs to be strained to an amount "x" in order to make it taut which produces a stress of "S". The painting will be strained to the same degree as the lining canvas. However this value is lower than if the

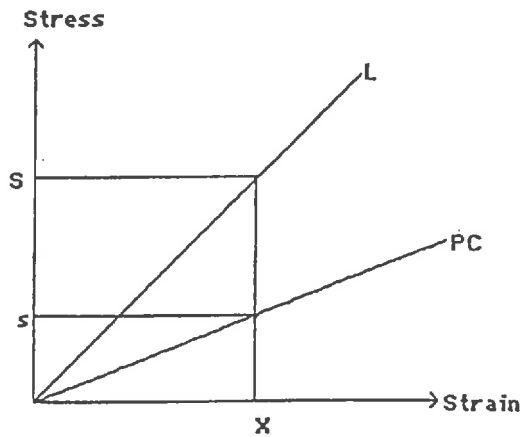


Fig.2

painting had to be stretched on its own to produce the same amount of tautness. As the painting is not as stiff as the lining canvas the stress value is therefore much lower.

If the conditions are reversed and the painting is stiffer than the lining canvas the amount of strain that is required to make the painting taut induces more stress into the painting than it does into the lining canvas.

RESULTS

Rabbitskin glue.

Sizing with rabbitskin glue stiffened the linens considerably, but the stress distribution for each was different. This may be accounted for by the yarn size, the 'pooling' of glue in the interstices and consequently the ability of the glue to lock the weave. This was particularly noticeable with the coarse linen, which had the largest yarns and the largest spaces in the interstices for glue to accumulate. Unlike the Fine linen, which when glue sized exhibited no orthotropic behaviour, the sized coarse linen had improved stress distribution between the warp and the weft yarns up to 10Kg.

After the light and thermal ageing it was found that the influence of the size on the yarns had lessened. The warp yarns of the sized medium weight linen, (Fig 3) had lost tensile strength where the size originally had greatest influence over their behaviour. The change in stress response of the weft yarns was not as significant as the warp, and on ageing had not altered greatly.

Plextol B 500 + 1% Rohaglt SD15

The Plextol B 500 linen samples were found to have increased in stiffness, and at low loads the stiffness was similar to those sized with rabbitskin glue. In order to establish the zonal transitions it would be necessary to extend the load test range. This was because the yarns extended in proportion to the applied load and it was not clear which zone the graph was representing. One explanation for this maybe that the size was acting as a buffer, affecting the linen extension and therefore masking the decrimping zone. After ageing, the graphs for the linens indicated a return to more characteristic unsized linen behaviour.

In contrast, (Fig 4) sizing with Permawear with Plextol B 500 stiffened it considerably, introducing an extensive initial zone of high modulus between 1 and 10Kg. Notably on ageing there was almost no change in modulus.

Primal AC 507

Primal AC 507K did not stiffen the lines as effectively as Plextol B 500 and as a consequence linen-like characteristics dominated over sized ones, for example an obvious decrimping zone. On ageing the influence of the size was diminished to the extent that the stressed linen behaved as if unsized.

The results for Permawear sized with Primal AC 507 closely matched those of Permawear sized with Plextol B 500 and this behaviour remained unchanged on ageing.

Vinamul 3252

Vinamul 3252 was not unexpectedly, an anomalous sizing material. It is a very rubbery-like material. At loads less than 1Kg, (Fig 5) the yarns displayed more elastic rubbery behaviour than unsized linen. Above 1Kg the yarns behaved like unsized yarns. For this reason samples of Vinamul 3252 were not aged, and from this evidence it would not be considered a suitable sizing material.

Paraloid B-72

Sizing with Paraloid B-72 introduced a new zone of high modulus in linen for loads of up to 8/10 Kg, (Fig 6) and the anisotropic behaviour of the linens was dramatically reduced. Paraloid B-72 increased the stiffness of Permawear considerably, but unlike Plextol B 500, which introduced an initial high modulus

zone which decreased above loads of 10Kg, Paraloid B-72 caused the fabric to extend proportionally to the load throughout the test range. Ageing appeared to improve the behaviour of

the sized linen. Extension in both warp and weft direction was more proportional to the applied load than when unaged. The Permawear was also found to increase in stiffness on ageing.

Graph to compare the relative stiffnesses of Aged and unaged medium weight linen sized with Rabbit skin glue

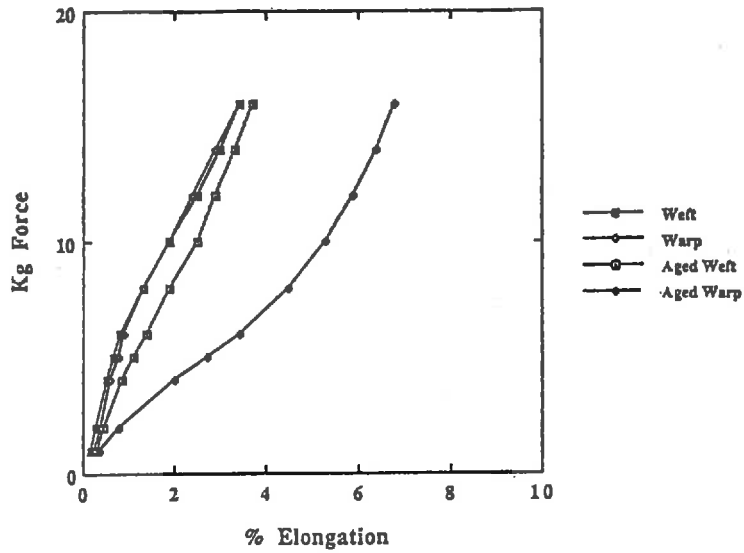


Fig. 3

Graph to compare the relative stiffness of Aged and unaged Permawear sized with Plextol B500

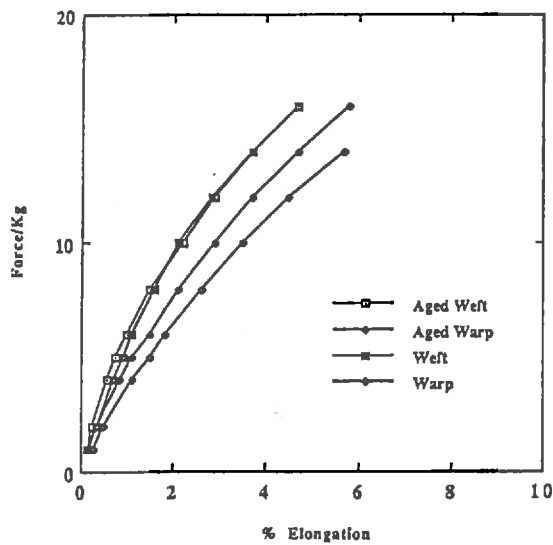


Fig. 4

Graph to show the flexibility of medium weight linen sized with Vinamul 3252

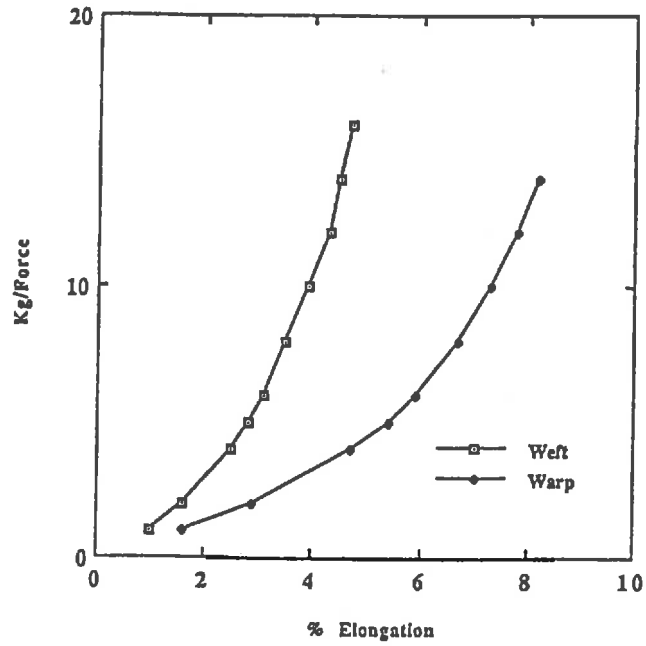


Fig. 5

Graph to compare the relative stiffnesses of Aged and Unaged medium weight linen sized with Paraloid B72

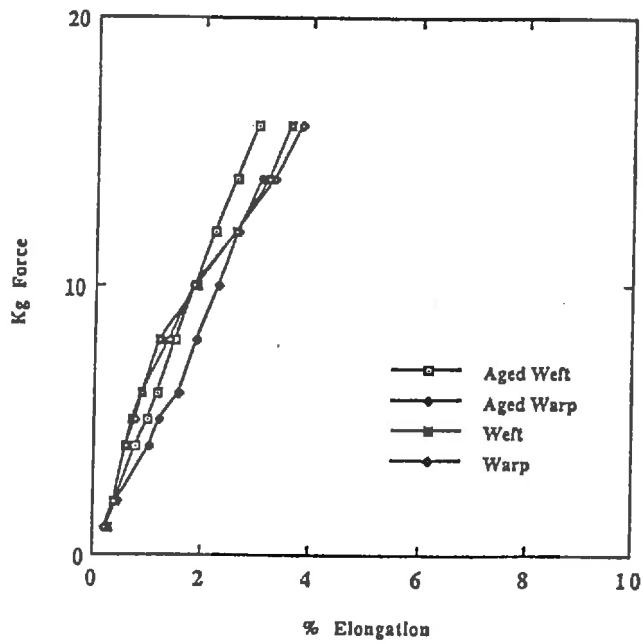


Fig.6

CONCLUSION

The rabbitskin glue stiffened the linens greatly at low loads, but when subjected to greater loads the sized materials reverted back to 'linen-like' behaviour. On ageing the influence of the size on the yarns had lessened. The glue failed at low loads, possibly by fracturing.

Plextol B 500 and Primal AC 507K stiffened the Permawear considerably even after ageing. However the graphs for all the aged samples of linens sized with these dispersions indicated a return to more characteristic unsized linen behaviour. This behaviour may have been exacerbated by the thermal ageing, at 85 degrees centigrade which may have caused the polymer to flow thereby weakening the bond between linen and size.

Although a large amount of crimp was removed from the linens before sizing the weft threads were consistently found to be stiffer than the warp. It is obvious that the dispersions were generally not stiff enough in themselves to prevent the yarns decrimping on increasing applied loads and therefore failed. In comparison, Permawear was found not to require as stiff a size as linen to alter the fabric behaviour, before ageing and after.

In comparison to the behaviour of the other sizes, Paraloid B-72 performed the most satisfactorily, and would appear to be the most suitable alternative to rabbitskin glue of the sizes tested for sizing linen. It increased the stiffness of all three linens to the same extent as the rabbitskin glue. For fine and medium weight linen the orthotropic behaviour of the yarns sized with Paraloid B72 was superior to those sized with rabbitskin glue. The improved behaviour of the sized linen after ageing may be due to a softening of the resin during thermal ageing, the glass transition temperature for Paraloid B72 is 40 degrees centigrade. A softening of the resin may have increased the surface area contact with the linen thus enhancing the size influence.

Further investigation in this area, if involving thermal ageing, would it is suggested from these results best be carried out at a lower temperature, or possibly a range of temperatures.

ACKNOWLEDGEMENTS

I would like to thank Alan Phenix for his assistance with this work, also Stephen Hackney for the time and interest he took in the project and Aviva Burnstock for taking the SEM photographs.

REFERENCES

Mecklenburg, M. 'Some Aspects of the Mechanical Behaviour of Fabric Supported Paintings', Report to the Smithsonian Institution (1982)

Hedley, G., 'Relative Humidity and the Stress/Strain response of Canvas Paintings: Uniaxial Measurements of Naturally aged samples', Studies in Conservation 33 (1988) pp133-148

Hedley, G., 'The Stiffness of Lining fabrics: Theoretical and Practical consideration', ICOM 1981 81/2/2-1

PRACTICAL APPLICATIONS OF RHODAMINE B: RESPONSE TO THE AGEING OF ARTISTS' OIL PAINTS

Gillian Osmond
Queensland Art Gallery

Research undertaken at the Tate Gallery in 1991-92 was discussed. Preparation and delivery of Rhodamine B was standardised for optimum performance. Winsor & Newton artists' oil colours were prepared as standard paint films. Paint standards were aged thermally, photo-chemically and by combinations of the two. Paint standards were examined in cross section with the ultraviolet fluorescence microscope. The autofluorescence of samples and their response to Rhodamine B were photographically recorded. The response of paint films to Rhodamine B indicated a general level of deterioration and corresponded roughly with property changes detected at a macroscopic level. Deterioration was determined as much by pigment

composition as by "age" and exposure environment.

The results of the research are to be published in two parts. "Accelerated deterioration of artists' oil paints: an assessment involving ultraviolet fluorescence microscopy" will be presented at the ICOM Committee for Conservation 10th Triennial Meeting in Washington D.C., 22-27 August 1993, and published in the Conference Preprints.

A paper detailing more practical aspects of Rhodamine B usage will be submitted for publication in the UKIC journal The Conservator Number 18, 1994.

Rupert Bunny Structure and Surface

Robyn Sloggett

Lois Mathieson

The University of Melbourne Conservation Service

One of the particular interests in undertaking microanalysis of works of art is being able to examine and identify the construction methods and material choices of an artist, and thereby identify the interests the artist has in the processes which achieve the finished artwork.

The works and papers of Rupert Bunny, which were bequeathed to The University of Melbourne's Museum of Art (and which include a number of sketchbooks, photographs, letters and other ancillary information) provided the wider field of enquiry, which in conjunction with the microanalysis of specific sections from oil painting and oil sketches, has provided some interesting initial insights into Bunny's working methods.

This paper is a preliminary report on research into Rupert Bunny and his materials undertaken with funding from the Australian Research Council, and completed at the Ian Potter Art Conservation Centre in 1992.

If we begin by looking at the materials themselves Bunny ostensibly has a strong concern for the quality of his materials. Throughout his life he preferred to use one supplier, Paul Foinet and then his son Lucien Lefebvre-Foinet, making do with other suppliers' materials only when he could not afford or obtain supplies from Lefebvre-Foinet (such as when he arrived in Australia in 1911). The University of Melbourne Art Collection has a number of letters between Bunny and Lefebvre-Foinet. They corresponded regularly and although there is discussion of plans and the Paris artworld in these letters, there is no discussion of paints or material preferences. These items occur as listed, priced items, not as an area engendering much interest or discussion. Similarly his other correspondence indicates an interest in exhibitions, style and taste, and his hopes for his career but there is no real discussion of the technical aspects of image making, other than criticism of 'modern'

contemporary styles.

When we move from the literature to the artworks and examine the way Bunny uses materials we find that, despite a very structured working method, working up from pencil sketches through oil sketches to the finished painting, (a traditional approach favoured by French and British painters of the Academies) there is little concern with extending the potential of the material. In the paintings examined visually and in those works which were examined by microanalytical means, there is for example very little variation in the method of paint application or manipulation, and generally little range in the technique used, which in earlier works is wet into wet brush work and in later works is generally wet on wet brushwork. As his work matures he is involved in a more sparing use of paint, an increased use of underdrawing and outline to define form, and increasingly the use of bare support as part of the image surface. However, overall his method of paint application is little altered from small drawn out brushwork with little textural interest. On a mechanical level there is no evidence of the use of palette knife, scumbling or sgraffito to vary the texture or surface of the paint layer, except in later works where the brush has been used with dry paint to provide an almost water colourist scumble. On a materials level there is little evidence except in a marginal way in quite late works of altering the 'workability' of the paint with the addition of varnish or additional drying oils.

Interestingly this is not the case with the oil or paper monotypes. This method involves one direct application of paint to a surface which was then printed to paper by contact. In these monotypes the medium is thinned, etched with sharp points or smoothed with Bunny's fingers to give a sense of texture and volume (and excitement) to the surface.

When writing up the information collected

during the course of this research it has become obvious that words like 'gesture', 'pose', 'form', 'flow', 'balance', 'counterpoint', 'harmony' are words Bunny would feel comfortable with whereas words such as 'imprimatura', 'glaze', 'chiaroscuro' would have little relevance. That is to say his principle interest is pose and placement not the potential of his materials per se.

Mary Eagle in her catalogue on Rupert Bunny¹ notes:

"In evaluating his own career, Bunny ignored the influence of his teachers, Folingsby, Claeron, Glaze and Constant, as if their effect was negligible, while acknowledging a considerable debt to Laurens. However it is quite possible, probable even, that his other teachers played the same role as Laurens in introducing the artist to story telling subjects and a structured rather than sensuous approach to the business of painting."

Bunny's debt to Laurens is evident not only in the finished works but is also obvious in the ancillary material which is housed in The University's Museum of Art. Mary Eagle notes²

"Laurens employed devices for creating a sense of dramatic immediacy. The protagonists in his paintings are actors whose performances are views from a low angle and so loom with a sense of theatre. The dramatic devices employed by Laurens have become familiar to us from twentieth-century film and in preparatory sketches, notebook sketches and small oil panel sketches the sense of stage and set are paramount."

David Thomas notes³ that Bunny signed the matriculation roll at The University of Melbourne on March 15 1881 to study civil engineering, but after six months had withdrawn in the hope of becoming an actor. Thomas notes⁴

"Theatre and stage was to become a life-long interest, reflected most clearly in his mythological decorations of the twenties and in his ballets of the forties."

This interest coupled with the training he received from Laurens and Folingsby with an emphasis on pose and setting led to the formation of several key elements which stayed in Bunny's work for the rest of his lifetime.

There is an interesting series of photographs in the University Collection which indicate very strongly Bunny's interest in pose and form. They appear to be a series of Bunny and three friends on the beach, posing in a manner very similar to those forms which Bunny was to later take and use almost as signifiers in his later works, particularly the mythological works of c. 1911 onwards. These photographs appear very much as staged poses even in one instance complete with drapery and a skull. One posed photograph resembles very closely another photograph of an as yet unidentified painting, perhaps indicating that these photographs were intended to act as models for more major work.

From these photographs, where the image is of paramount importance, we move through to the groups of pencil, charcoal and oil sketches.

The first group of this material is the notebooks. Throughout his life Bunny kept notebooks where he recorded images and thoughts (including musical composition). The notebooks fall into three broad groups; the life drawing sketches, the compositional sketches and the more finished sketches (although the material is of course much broader than this).

Life drawing is a standard practice for artists and as a discipline has a well defined history. It is usually a discipline which is often practiced rather more in the early life of an artist and is often seen as an exercise to facilitate skill in rendering. Bunny recognized the poor quality of his own draughtsmanship and said of Laurens's insistence on proper draughtsmanship:⁵ *"I kept on at my drawing for a long time after the master had said, "Now you may go into colour".* His life drawings indicate an ongoing interest in form and shape. Although the dates of these sketchbooks are not yet definitely ascertained (Lawrence Course thinks that they date from Bunny's early days in Paris when Bunny was converting from the British School method of fine line to contour and these are from this period and from a later period in Australia⁶) they indicate laboured and increasingly 'worked' forms. There is the sense that Bunny

had difficulty in 'reading' a form and an inability to feel at ease with an 'inappropriate' stroke. There appears the constant need to alter the image in order to 'get it right'. Interestingly like his later mythological scenes and later sketches where there is the use of outline to delineate and define form, the interest in these life drawings relates to form, there is little or no modelling, and form is defined by quite heavy undifferentiated linework. The linework is heavy, dark and thick and the pencil line appears to be manipulated from a well worn tip, not a fine sharp point.

Another group of sketchbooks contain the compositional sketches. These are Bunny at his most basic working level. They are in many instances no more than the delineation of space and are sometimes so abstract and hurried as to be unreadable. They are defined by a loose but awkward working method, with the emphasis on the definition of position and shape rather than form, and positioning appears to be the major preoccupation. The idea of Bunny working through 'stage settings' is strongly evident in this group. There is little sense of draughtsmanship in this group of sketchbooks and sketches and materials are used roughly with no sense of the 'particularity' of the medium. Unlike the landscape and women sketches which will be discussed next Bunny used unsharpened soft lead pencils and heavy undifferentiated lines, similar materials to those used in the life drawing sketchbooks.

The third group of sketchbooks and sketches contain finer delineations of landscapes and women. Almost without exception Bunny works these sketches with a soft pencil, using a fine, controllable, constantly sharpened point. In these works there is a tight, controlled use of the medium, often with a quite high degree of modelling. The sketches of women in languid poses have particular reference to the large finished works of similar themes (such as The Song in the Distance c. 1909 or Scandal c. 1908) in the insistence on detail and finish.

As part of the Rupert Bunny Bequest The University has a large number of painted oil sketches representing a wide range of dates probably from around the turn of the century to the 1930's. These sketches can basically be divided into two groups, the genre scenes, and the mythological/exotic scenes.

The first of the genre scenes group which I will discuss we have called (Women with Parasols). The work is executed on a thin strawboard support with a Foinet stamp on the verso⁷ giving an earliest possible date of 1886 (that is the date of Bunny's move to Paris. The work could of course be much later. The Foinet stamp was changed in 1898 to Paul Foinet and Lefebvre. The support has no ground. The palette is high key in the choice of pigments, however the method of working wet into wet produces a mainly 'murky' There are some areas of wet on wet in this work where colours are clearer, however the overall impression is of mixed, lower key values. The work has a black border acting like a frame to delineate the pictorial space.

Examination of a microtomed cross-section from the foreground revealed the use of zinc yellow mixed with lead white, a trace of earth pigments, viridian with cobalt blue, lead white broken down the earth red and other chromium pigments, and a black comprising ultramarine, vermilion and lamp black. A similar section from the surface layer above the parasols indicates that mixing of the paint occurred on the surface where three layers have been mixed together. If we examine the painted surface closely it becomes clear that we cannot relate the layer sequence of a cross section to a consistent painting sequence, indicating the use of wet into wet technique.

A microtomed section from the parasols (taken from a pink/grey section similar in colour and tone to the flesh tones) indicates the use of red earth with a small amount of vermilion, broken down with lead white, ultramarine and a little viridian. A yellow chromium pigment occurring in small amounts may be strontium chromate.

The examination of the cross sections could lead one to expect a very high key work, however the overall impression of the finished surface is murky. The palette in this work is similar to that of the later Botanic Gardens sketches. In (Women with Parasols) Bunny has used chrome yellow, zinc yellow and possibly strontium yellow. A similar palette appears in the Botanic Garden sketches. However in these later sketches there is less working up of the surface. In these Botanic Garden oil sketches Bunny alters his use of paint to accommodate a lighter touch. There is the use of wider

brushwork and a more sparing use of paint (to the point where the areas of support are used as part of the surface) as well as a thinning of the paint to provide a semi transparent effect (similar to that achieved in the monotypes). These techniques both result in, and result from, an interest in producing much clearer colour values as Bunny's work matures.

A later work (probably from around 1913) is the sketch for On the Seaweed.

This sketch belongs to a group of studies from original drawings of figures on the beach.. These resulted in the painting On the Seaweed exhibited at the Societe Nationale des Beaux Arts in 1912, and in sketches for designs submitted for the Australia House competition in 1914.

Mary Eagle notes⁸

In these studies.....Bunny moved towards a "danse chromatique" (his own phrase) posing his models in dance positions, augmenting the flow of their bodies by the use of loose drawing and rythmically ordering a select colour scheme..

At this time Bunny expressed a desire to paint "great pictures for great rooms, pictures that would be part of the room itself"^{8b} The central left figure of On the Seaweed is repeated in a number of variations on the pose in a number of sketches. Genre sketches which are similar to On the Seaweed lead, around this time, to the development of the later series of mythical/exotic sketches. The theme of rhythm and pattern is developed more readily in these more theatrically designed works.

One of the earlier and less theatrical oil sketches in the mythical group is one which is suggestive of the Roman goddess Flora strewing flowers. The use of flowers as a point of compositional interest is a device Bunny often employs to give drama and highlight to his works (such as Venus revealing herself to Phaon c 1913, Portrait of Mary Meyer and Nocturne 1911). While (Flora) does not appear to have a companion pencil sketch many of these mythological sketches have related pencil sketches which are generally extremely sketchy relating to the delineation of shape and position. Visual and microanalytical analysis of samples from (Flora) indicate again the use of

a wet into wet, as well as wet on wet application. The work is on a strawboard support that has a high percentage of woodpulp in its composition with a ground comprising lead white, viridian, red lake and earth red. It does not have an identification stamp. An area of buff/flesh tone, taken from an area under the green garment, comprises lead white, lake with earth red, viridian, cobalt blue, and a trace of cadmium yellow. The green tones from a green layer under the olive-green orb comprises viridian with earth red and some red lake in lead white tinted with a trace of yellow ochre. The pigment layer of the orb comprises a thin layer of lead white with cobalt blue, some black and earth red. The overgarment is made of a green comprising emerald green and a little cobalt blue. Bunny reworked this sketch, altering the position of the arm, indicated by the resultant awkward ill defined arm and obvious in infra-red photographs. In the later mythical sketches Bunny manipulates paint in a drier, thinner manner than he does in the genre oil sketches. In all sketches he uses outline increasingly as he gets older, but in the genre sketches the outline is often a detailed linear drawing underneath the paint. In the mythological sketches and the related completed paintings the figures are heavily underdrawn and/or outlined. This work has a heavy black border, similar to that on (Women with Parasols) and often employed early by Bunny to locate the definition of the picture plane. In later oil sketches this border becomes simply an unpainted surround, still existing but obvious by its lack of paint which delineates it materially and physically from the image/paint area. Unlike (Women with Parasols) this work has a ground layer. Its heavily worked surface, and the provision of a ground layer would seem to indicate that Bunny had an interest in working up this image to a more finished state than the genre sketch (Women with Parasols).

Despite his interest in genre and mythical images Bunny was also keen to attract commissioned portrait work. In 1911, when Bunny arrived in Australia he sought such commissioned works to bolster his failing finances. One successful commission was the Portrait of Dr Leeper executed between November 1911 and January 1912. (Bunny was only in Australia from 29 May 1911 to 30 January 1912).

This work was commissioned by the Union of the Fleur de Lys, a group of ex-Trinity College students, of their past master. The work has a red lead oxide priming on the reverse and a Dean company stamp.¹⁰ The work which appears to be commercially primed has a double ground with a base coat of chalk, then a layer of barium sulphate and lead (with the barium sulphate appearing to have sunk to the bottom of this layer.). Paint on the face is evenly applied and the brush work is non-differential in terms of texture, length and width of brush stroke.

The work has two preliminary oil paintings (one which is in Janet Clarke Hall at The University of Melbourne and the other in the ANG, Canberra) and perhaps this is one reason why there appears to be no underdrawing (both infrared and cross section examination failed to give any indication of preliminary drawing or underdrawing). In fact in all the oil sketches examined there does not appear to be any underdrawing until around 1913 when some of the mythological sketches show the use of outline. Later all the Botanic Garden sketches show the use of an underpainted delineation of form. Although the work had a very discoloured dammar varnish there was no evidence of glazes having been used. Samples taken from the hand and the background indicate the use of a preferred choice of paint. Analysis of a cross section from the hand indicates a flesh tone that is the same as that used on (Flora), namely red lake, which has been identified as madder, earth red and a trace of vermilion, broken down with viridian, a little ultramarine and a trace of yellow in a lead white matrix. This was a favoured mix for Bunny at least until 1913. Similarly the background uses a mix of viridian broken down with earth red, a common mix used by Bunny to produce a mid green tone, and again evident in the background of (Flora) and the Portrait of Percy Grainger.

Another work which has a sense both of the commissioned portrait and the genre work is (Woman and Child) or more probably (Mother and Child). This work came into the University as part of the Bequest and so does not appear to have been sold or to have been a commissioned portrait.

The subject matter belongs to a series of sketches of women and children, women with

children and women in hats, although the work has the direct gaze of the commissioned portraits unlike the sketches which tend to 'catch poses'.

Mary Eagle notes¹¹ that in 1904 Bunny sketched the Bunnys' maid with her child, although the face of the woman bears some resemblance to pictures of Bunny's wife Jean (Lawrence Course believes the work was done by Jean and the Bunny monogram was added when the work left the studio after Bunny's death and not when the work was painted).¹² Again there is no evidence of underdrawing and the work exhibited an even undifferentiated texture. There does however appear to be some use of outline, for example around the child's chin. Infra red photography however shows no evidence of underdrawing.

A large finished mythological painting Oedipus and the Sphinx (belonging to The University of Melbourne's Institute of Education) is particularly interesting because there is a related oil panel in the University Collection. Neither works have been dated however the style, handling and colouration of Oedipus and the Sphinx indicated a date between 1910 and 1919, probably earlier. The oil sketch for this work has a muddied use of colour. Both the painting and the panel appear to have the same pigment range however the overall appearance of the panel (wet into wet) is much 'muddier' and darker, probably the result of scale, indicating that Bunny did not accommodate his use of materials to scale. This work like (Mother and Child) has no evidence of underdrawing, but some evidence of outline, which is more pronounced than in (Mother and Child) but less pronounced than in later mythological/exotic scenes.

A study of this nature, which involves looking closely at a limited and defined set of works can provide some interesting information about wider issues relating to the artist's work. While it is not always sound to generalize about an artist's working method from a study of selected works, in the case of Bunny there are several key practices which are initially developed at pencil and oil sketch level and then worked up sometimes through a number of more finished oil sketches to the finished painting.

Particularly evident is Bunny's ongoing interest

in the theatrical possibilities of painting. His interest in pose, position, and gesture is evident through all the material including the major finished paintings, preparatory oil sketches, working drawings and photographs. Further his method of execution relies not on an understanding or interest in the particularity of the medium, but rather on the underwriting of form through the use of pose and colour initially, and increasingly pose and colour reinforced and strengthened by the use of outline. The use of outline appears to stem from a period post 1911 after Bunny's return to France from Australia. In earlier oil sketches a border is often used to reinforce the sense of the picture plane (and probably assist in providing weight and depth). Interestingly as Bunny matures he loses his interest in the use of light as a compositional device to provide form delineation and relies much more on the luminous resonances set up between contrasting colour to give a sense of light to the works. He also uses thinned colours or colours which are thinned by the use of bare support between brushstrokes. The images become, as it were, internally lit rather than stage lit from the side beyond the picture plane.

Although in earlier works he appears to have an interest in the resonance of colour, the painted surface is laboured with a heavily worked wet into wet technique which results in a muddy surface. With time he modified his use of paint to a wet on wet method. In later works the purity of colour appears to be a major interest and some later panels and works have areas of distinct wet on dry working where particular care has been taken to preserve the purity of colour through the layers and take advantage of the white or colour of the support and ground.

He manufactured flesh tones with lead white, lake, earth red with viridian and a little ultramarine. Throughout his career he used chromes (chrome green, viridian and yellow), and a common darker green was made of viridian with a little earth red.

He never lost his tight formalized method of working up a painting from pencil and oil sketches, but later in life incorporated the linear working of the pencil sketches in the outlines of the forms in large finished paintings.

There are a few monochrome watercolour sketches in the sketchbooks which indicate an interest in tonal exercises, but these do not translate and can not be related to other sketches or finished works. They are not more than they appear, that is small isolated exercises in theory which were not developed through his range of expression. Bunny might have been interested in the "danse chromatique" but it was colour not tone that he developed through his career.

In line with his interest in pose and form is the fact that inevitably his interest in composition relates to the planar surface, and increasingly the interest in the surface precludes any interest in a trompe l'oeil effect. Although in the traditional area of portraiture he maintains an interest in form in space, increasingly in the genre and particularly in the exotic/mythological works, his interest is in placement and pose. Perhaps the fact that he had a strong need to locate form properly, and obviously had difficulty with the depiction of mass in space, led him to strengthen his skills in placement and colour as compensation. In the sketchbooks the need for forms to be located properly is evident in the heavy reworkings and erased areas. These sketches are about placement not form, mass, texture or light. In the painting the brushwork underwrites outline or area, and as his work matures there is less and less interest in creating form but rather more in delineating shape in the picture plane. In his method of working up a painting, and in his obvious hierarchy of interest, pose comes first then colour and light.

REFERENCES

- 1 Eagle Mary "The Art of Rupert Bunny"
Australian National Gallery Canberra,
1991 P12
- 2 Eagle Mary Ibid P6
- 3 Thomas David "Rupert Bunny"
Lansdowne Australian Art Library
Melbourne 1970 P12
- 4 Thomas David Ibid P12
- 5 Southern Spere(M) Vol II No1, July
1911, P15 as quoted in Mary
Eagle(Note1)
- 6 Lawrence Course in conversation with
Robyn Sloggett, 6 May, 1993
- 7 "Paul Foinet(Van Eych)5-? Rue N D
Des Champs Paris 8 Toiles et Couleurs
Fines
- 8 Eagle (as in note 1) P106
- 9 Eagle Ibid P107
- 10 The stamp reads "W & G Dean Artist's
Colourmen, Framers Equitable Place".
- 11 Eagle Ibid P129
- 12 Lawrence Course (as in Note 6)

RESEARCH INTO THE HISTORY OF CONSERVATION AT THE NATIONAL GALLERY OF VICTORIA

Liana Fraser
Fine Arts Department, University of Melbourne

Often in scholarly research, important things are neglected because of the nature of "scattered institutional records".¹ Just so, the History of Conservation at the National Gallery of Victoria is a relatively uncharted area, chiefly due to the unordered and fairly inaccessible state of the National Gallery's archives. To complicate matters even further, it seems that in the late 19th century conservation was only fully understood by a specific artistic group – therefore – any relevant correspondence was not catalogued in separate files, but distributed into many different areas of the Gallery's correspondence. With this in mind, it is not difficult to see how the misconception has evolved, that some individuals began "pioneering work in conservation, in the 1950s and 1960s".² However, last year I decided to tackle the National Gallery's archives, inspired by the fact that a number of the early Trustees Reports reflected a genuine desire to provide appropriate physical conditions for the artworks in the collection. Evidence from various sources in the Gallery's archives shows that pioneering work in conservation methods actually began shortly after the Gallery's inception as a part of the Public Library in 1863. For the purpose of this paper, I will focus on the period between 1870–1970 which I have divided into two stages. These stages accommodate two significantly different components in the development of conservation at the NGV.

PART 1

The first era of conservation at the NGV falls between 1870–1930. During these years, it was traditional practice to avoid airing conservation issues relating to the deterioration of the Galleries treasures. Therefore, the comments in the early Trustees Reports only provide us with information regarding the environmental precautions taken by the Gallery. For example, in 1870–1871 Annual Report the Trustees voiced their concern that the works in their

custody were being "exposed to the vicissitudes of temperature, to the glare of light, and to the influence of dust and smoke, which either separately or combined must in time effect them very injuriously".³ In 1870, the Report of the Commissioners reflected similar concerns, proposing that the treasures should be moved to a new wing in Swanston St. It was recommended that the room "should be fireproof, and proper precautions taken to prevent the admission of dust, as well to provide against the extremes of temperature".⁴ The Trustees hoped that the Government would be inspired to provide funds for this cause, persuaded by the conviction that the pictures, when lodged in a new building would "be preserved from the daily increases of deterioration to which they are now exposed".⁵ Executing further caution, the Trustees also sought the advice of experts on the design of the new wing before they spent the sum granted by the Government.⁶

The need to move to a new building was accelerated by the fact that some of the pictures were "suffering perceptible injury" from the smoke expelled by the chimneys of Melbourne Hospital.⁷ Finally, in 1874 the picture collection was relocated in the newly designed MacArthur Gallery. Following the move into this building, Eugene Von Guerard, Master of the School of painting and Curator of the Gallery, began monitoring the climate, humidity, light and ventilation. On one occasion he noted that it was mostly "10–11 degrees fahrenheit lower than the injurious heat in the old building".⁸ As a further precaution, in 1875 Von Guerard also initiated a new rule which ensured that the "pictures and their frames [would] not continually be changed and moved with the risk of being injured...".⁹

Although there were numerous references to the precautions taken with the environmental conditions, the Trustees Reports proved to have little information about the methods

employed to physically treat the artworks. It was only after sifting through the Account Books, Letters to the Chief Secretary, General Correspondence, Internal Committee Letters and Miscellaneous Files that I began to realise that the Gallery's administration was aware of, and dealt with the issue of physically restoring artworks as early as the 1870s. For instance, the Gallery's Account Books show that payment was frequently made to Mr Fletcher, and Mr Isaac Whitehead throughout the 1870s, and then to Mr Peacock in the early 1880s, for "cleaning, restoring, repairing, and varnishing oil paintings and also for repainting and regilding frames".¹⁰

In a file containing some of Von Guerard's monthly reports, there are a number of documents in which conservation activities are discussed. One specific case deals with the newly arrived painting by John Herbert, entitled Moses bringing down the Tables of The Law¹¹, which was badly damaged during transit to Australia. Both Von Guerard (the curator) and Mr Fletcher (the employed restorer) completed reports on the condition and treatment of the artwork, but these reports were only forwarded to the Melbourne Gallery's Chairman of Committee, and were not printed in the public Annual Reports. In Mr Fletcher's report he described how they carefully "followed the written instructions given by Mr Herbert" and accordingly unrolled the picture. Fletcher noted that the "blotting paper with which [the picture] was packed ... was thoroughly wetted and as far as possible removed". Additionally, where paper had been embedded in the surface on parts of the canvas this was rectified by "quick friction with wet fingers", except where the "skin of the painting was quite destroyed". Fletcher concluded his explanation of the treatment stating that "By permission of the Committee I replaced the damaged portions of the whole canvas with a thin coat of best mastic varnish. The painting now has an even glaze over the whole surface and all traces of the injuries have been removed...".¹²

The selection of an appropriately qualified restorer was another complicated matter that confronted the Gallery administration. This is evident from the numerous applications made to the Gallery, in which individuals sought employment in conservation related duties. For example, in Mr S.C. Steele's application for

employment he included a number of references which attested to his character and qualifications as a restorer.¹³ It was noted that he "showed himself to be skilful in cleaning and restoring old paintings".¹⁴ In 1874 another applicant, named Mr David Brown, wrote to the Gallery regarding the position of Assistant Custodian. He claimed that he was "conversant with paintings generally, the mode of hanging them ...and treatment to be observed with a view to their preservation".¹⁵ It is interesting that at this time the Trustees made it clear that they sought the professional assistance of a "competent person" for the purpose of cleaning and varnishing as in previous years they had allowed Von Guerard to restore artworks in the collection.

The tradition of concealing the restoration of artworks indicates to us that there was a definite insecurity with the idea of physically interfering with the pictures. This fact was true of conservation in London as early as the beginning of the 19th century. For example Sir Charles Eastlake, the first director of the London National Gallery, chose to have his new acquisitions restored abroad¹⁶, inhibited by local criticism. The criticism he avoided had been fuelled by a cleaning controversy that took place in London between 1846-1853, an event that would repeat itself in Melbourne several decades later.

Mr George Folingsby succeeded Von Guerard's position as director of the Gallery in 1882, and he was then replaced by Bernard Hall in 1892. Both individuals were undoubtedly aware of the controversy that had been associated with restoration in London, and so they attempted to modify the physical treatments that Von Guerard had maintained. For example, Folingsby minimalised the restoration of artworks in the collection, claiming that it was a "very dangerous process"¹⁷ to clean and restore pictures that were newly painted, as were most of the pictures in Melbourne's collection. Mr George Verdon, Secretary of the Trustees, authorised this change instructing that "It [was] expedient that nothing further [should] be done in the way of cleaning, restoring, or repairing any of the pictures".¹⁸ However, both Peacock and Paterson, who had been employed by Von Guerard, wrote to the Gallery to defend their professional reputations.

For instance, Paterson attacked claims that he had caused a number of pictures to crack (especially Chevallier's) by placing too much varnish on them. He argued that he had used only the "thinnest possible coating of varnish" and that "varnish does not cause pictures to crack anyway".¹⁸ Despite these protests Folingsby continued with his policy, except for the rare occasion when he followed in Eastlake's footsteps by sending the works abroad for expert attention. Such an occasion can be seen when Melbourne's picture Quatre Bra 1815 was sent to London National Gallery to be treated by the English restorers, Mr Siguier and Mr Smart. This small matter of debate raised by the artists highlighted the beginning of what was to become Melbourne's own Cleaning Controversy.

When Bernard Hall assumed authority of the Gallery in 1892, he attempted to continue with the conservative practices previously employed by Folingsby. However, it was not as easy for Hall to implement his policy because an unprecedented public awareness about the physical condition of Melbourne's collection was emerging. The public began to question the administration of the Gallery in a debate on restoration that sprang up in 1899, in the Melbourne newspaper, the Argus. One particular article that initiated the controversy was entitled "Danger and Decay", and was printed in the Argus on the 5th of February, 1899. The author declared that the National Gallery of Victoria's pictures had not been properly "overhauled and cleaned as any private collection would have been ...[but remain]...in their long-established condition of neglect and advancing decay".¹⁹ Several works were listed, and the state of their condition discussed. For instance, it was claimed that John Mogford's Watergate Bay was "encrusted with dirt and accumulated fly-marks because it [had] not been washed in almost 6 years". The author stated that gentle moisture and friction with the corner of a handkerchief had been the method for artists to remove these marks for many years.

Hall came under further criticism, which was highlighted when one particular author claimed that "the pictures in our National Gallery are perishing for want of a skilled restorer". A contrast was made with London National Gallery, it being pointed out that London had a

"keeper", – whose specific role [was] to watch the artworks "incessantly", – in addition to a salaried restorer, and assistant restorers. Hall responded by saying that he opposed the idea of continually cleaning the pictures, and categorically informed the readers that "dirt should not obstruct the true art-lovers appreciation of the artworks". He added that the work done in the New South Wales Art Gallery by the conservator, Mr Montifiore, neither arrested the decay nor averted it, because the problems treated in the works had returned. Hall also controversially declared that the ideal to which restorers aspired for the proper state of an artwork was one that required "a perfectly smooth and polished surface". Yet, he also admitted that he "knew nothing about the methods of the professional picture restorers" as he had "no visible experience of their methods".²⁰

Mr Isaac Whitehead Junior, son of the late Isaac Whitehead who had restored a number of the Gallery's artworks in the 1870s, rebutted Hall's criticisms. He contended that a restorer who had an ideal vision of an artwork, was a "different operator" from one who was "specially trained and educated to his own work, deft of touch, and exquisite of manipulation".²¹ Whitehead also refuted the claim that restorers were to blame for damages caused to Melbourne's picture collection. He argued that the annual varnishing days held at the Royal Academy London were a more likely source of this problem.

The outcome of this debate was condensed by one writer's statement, that the Gallery should see to the "timely restoration which may get past recall".²² The Trustees clearly recognised the need to address the situation, and soon thereafter wrote to the National Gallery of London requesting their opinion "with regard to the advisability of cleaning and restoring" the collection.²³ In this letter, the Gallery forwarded some photographs of the pictures from the collection which had suffered most from cracking. Extracts from the London's replies were subsequently published in the Argus to outline the opinions of various English authorities. A variety of methods were suggested in these responses, but on the whole, the ideas were not dissimilar from those recommended by the original contributor to the Argus, Mr Whitehead Junior. Most of the

London experts advised that the Gallery should adopt practices such as "incessant watching, perpetual attention, immediate remedy, and action at the first sign of decay".²⁴

Interestingly, Hall continued to show a lack of confidence in local restorers. Sometimes Hall completed restorations himself, or as it happened on one occasion, he sent A.C. Gow's No Surrender in its reportedly "dangerous state" back to the artist for repair. He also continued in Folingsby's and Eastlake's footsteps by relying on foreign experts when professional attention was required for the collection. During Hall's directorship, it is known that two visiting English experts Mr Muckley, and Mr Colley were engaged at different times to "clean" and "restore" a combined total of at least 60 of the NGV's pictures.

PART 2

It is surprising that these controversial issues regarding the restoration of the collection, were absent from the Trustees reports throughout the duration of the public furore in 1899, and furthermore between the years 1904–1930. This meant that up until the 1940s very little was recorded in the Trustees Reports as far as the formal documentation of conservation practices was concerned. Nonetheless, the early 20th century heralded a new era for conservation at the NGV. Inspired by the growing recognition that the collection required an on-going system of maintenance and preservation, a full time restorer was sought and other improvements were made in the areas of administration and scientific analysis. This period of conservation at the NGV demonstrates the progress made towards establishing a formal policy in Conservation.

Following World War I, advanced scientific apparatus and facilities introduced a new meaning to conservation of art. This can be seen in one particular instance at the NGV when some works were lent to the Art Gallery of Western Australia, and upon their return were found to have been damaged during transportation. For the first time, the artworks were restored by "experts" with a scientific training.²⁵ It was reported in the Argus on August 27th, 1932 that two chemists from the "Railways Testing Laboratories" were employed

as "picture restorers", and this article seems to be the first public report on the scientific aspect of restoration in Melbourne. In the article, which was entitled "The Virtues and Vices of Chemistry", the chemical composition of "copal, shellac and mastic" varnishes was analysed along with a prescribed method for removing these materials.²⁶

Under the directorship of William McInnes and Mr J.S. MacDonald between 1933–35, the Gallery witnessed an overhaul of attitudes toward the upkeep of the collection. In 1937 the first alteration within administration was highlighted by the careful consideration given to the choice of 'restorers'. In a letter to the Chief Secretary of the Public Library on the 31st August 1937, both McInnes and MacDonald explained that they did not think very highly of the work done by the current restorer, Mr Clewin Harcourt. A few months later, Mr Harley Griffiths was suggested by MacDonald as a replacement for the position of picture restorer. MacDonald also suggested improved documentation of restoration work, proposing that "the keeping of correct technical catalogues...[and]... proper card indexes be initiated".²⁷

It should be noted however, that MacDonald had much trouble motivating the Government to re-assess their priorities, and the distribution of their funding. Consequently, MacDonald's efforts to initiate a more thorough system of maintaining the collection were restricted, show in one respect, by the fact that the restorer Harley Griffiths remained a part-time employee for many years.

In a formal report to the Trustees, Griffiths himself attempted to explain that "intermittent attention" was not sufficient for "the most valuable collection of pictures in the southern hemisphere".²⁸ He argued that it was not "sound policy to permit the pictures to depreciate in value as they will inevitably do when neglected", and he added, that competent treatment of overseas collections had resulted in "first class order".²⁹ Although it does not appear that Griffiths received an annual salary or retainer, some agreement must have been reached with regard to his employment as Griffiths was soon to embark on a "Cleaning of [the] pictures programme" at the NGV.³⁰

This appears to have been the first known policy defined in the area of Conservation. To ensure that the administration of this policy was appropriately managed, MacDonald also suggested the formation of "a committee composed of [himself] and the three painter members of the Trustees board", for conservation matters that the Trustees felt were too large to be considered by MacDonald alone. This committee helped to establish conservation in a more professional role at the NGV. The four members consisted of Sir John Longstaff, Mr Max Meldrum, Mr Colquhoun, and Mr Daryl Lindsay. They discussed estimates for the works Griffiths was to restore, and proposed treatments. It is interesting to note that it was not considered important for Harley Griffiths himself, to be present at these meetings. Another important innovation as far as the "cleaning programme" policy was concerned, was that Griffiths commenced to retain records of his technical treatments. The retention of this type of record in the National Gallery archives epitomises the new stress placed on maintaining a history of the physical treatment of the collection.

The practice of obtaining advice from experts abroad that commenced during the 1899 media debate, was embraced by the Gallery again during these crucial stages of development in conservation. Shortly after Daryl Lindsay assumed directorship in 1941, he was anxious to implement a policy of "sending officers abroad for experience and training".³¹ Thus Harley Griffiths was sent to London to "learn the latest methods of restoration and preservation...under the best experts in the field".³² Griffiths first hand knowledge of the advanced scientific methods used by Mr Helmut Ruhemann in London, must have prompted the establishment of a new research laboratory at the NGV. Griffiths was also given access to infra-red and UV ray photography equipment.

Having witnessed the expertise of London's conservators, Griffiths and Lindsay decided to send Tiepolo's Banquet of Cleopatra to the English restorer Mr Horace Buttery, "with a view to having it cleaned and possibly relined".³³ This marked the beginning of a major turning point in conservation at the NGV, highlighted by the public's positive response when the picture was exhibited after cleaning.

Ursula Hoff has noted that the Tiepolo was viewed with "renewed interest", also commenting that "lingering" doubts about the author of the work could now be removed.³⁴ At the London National Gallery exhibiting cleaned works was not a new exercise. In 1947 the notion of cleaning was explored publicly in the Exhibition of Cleaned Pictures staged by Philip Hendy. In 1953 the NGV repeated this experiment, with their own Exhibition of Cleaned Pictures. A number of half-cleaned pictures were hung in the Swanston St. Gallery for inspection, displaying Griffiths' achievements. One of the Gallery staff, Mr Arnold Shore described that the effect "provided almost a revelation", and furthermore that it was "as though half of each picture was obscured by a very dirty glass or muslin".³⁵

The Gallery began to publish details of various treatments, inspired by the new-found knowledge that conservation was important for visual effect and scholarly interpretation, as well as protecting the artworks from deterioration. For example, Arnold Shore wrote an entire article on conservation at the NGV, in the Gallery's new publication entitled The Quarterly Bulletin. He discussed the effect of the removal of discoloured varnish on works such as Moreland's Farmyard, Boudin's Havre Harbour, and Constable's West End Field's Homestead to name a few.³⁶ Shore also criticised the "once wholesale method of ...applying liberal coats of varnish" and the practice of "rubbing linseed oil, with or without turpentine" into the pictures. He claimed that when removing varnish "present day authorities" now agree on "a discreet balance between physical necessity and aesthetic sensibility".

The integration of conservation within the administration of the NGV is epitomised by a number of factors. For instance, prior to the 1930s conservation matters were given little, if any attention in Trustees reports, and yet by 1941 such issues were recorded in a separate section under the subtitle - 'Conservation'. Daryl Lindsay verified the new significance of conservation from another viewpoint, stating that "the establishment of a research lab [was] one of the most important steps" taken in recent years, as "for the first time we are able to deal with the major problems of picture cleaning and restoration".³⁷ In a similar way, conservation was also built into the permanent

structure of the new Gallery building, which was opened in St. Kilda Road in 1968. Eric Westbrook has explained how conservation gained new recognition in the St. Kilda Road building, in terms of theory. In an article, entitled "The Machinery of the Gallery" Westbrook analysed the framework of the Gallery noting that the significance of the physical condition of an artwork is not limited to the conservation laboratory. He pointed out that a knowledge of conservation was very important for the Curator's role, and also for the Exhibitions officer who protects and preserves the artwork when it is mobile.

The setting up of conservation facilities in the 1960s, and including this department as a responsibility that is implicit within administration, reflects the Gallery's ambition to achieve an international standard of museum management. By 1970 a verbal and mutually acknowledge policy for conservation emerged alongside the practices of the department, despite that there was not written policy to attest to this fact. The practiced and established system of Conservation throughout the era of 1930-1970 can be seen as a foundation for the development of the written policy which came into being two decades later in 1988.

REFERENCES

1. D. ROBERTSON, Sir Charles Eastlake and the Victorian Artworld, Princeton University Press, New Jersey, 1978.
2. S. WALSTON, "The preservation and conservation of Aboriginal and Pacific cultural material in Australian Museums", Preserving Indigenous Cultures: A new role for Museums, Papers from a regional seminar, Adelaide Festival Centre, 10th-15th September, 1978, Australian Government Publishing Service, Canberra, 1980, p.187.
3. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1870-71, p.66.
4. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1870-71, p.66.
5. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1873-74, p.4.
6. Public Records Office, Report of the Trustees of the Public Library, Museum and National Gallery of Victoria 1873-74, 'Report of the Sectional Committee of the National Gallery', p.67 - For instance, they made inquiries to the Building Committee of the Public Library, and to the Inspector of Public Works, the Government Astronomer, and the Architects of the Corporation.
7. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1873-74, p.40.
8. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1875-76, 'Report of the Sectional Committee of the National Gallery', Appendix A: Report of the Master of the School of Painting 1875, p.41.
9. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1877, p.38.
10. Public Records Office, VPRS 5840, Unit 1, National Gallery Account Book.
11. JOHN ROGERS HERBERT 1810-1890, Moses bringing down the Tables of Law, Oil on Paper, 11ft. 2" x 20ft. 8", purchased in 1878.
12. Public Records Office, VPRS 5863, Unit 3, National Gallery Letter Book, Letter 73, from A Fletcher to the Chairman of the Committee of the National Gallery, 19th March, 1978.
13. Public Records Office, VPRS 4363, Unit 10, Miscellaneous Correspondence, Letter to the Chairman of the

- Committee of the National Gallery from Mr. Steele, 1872.
14. Public Records Office, VPRS 4363, Unit 10, Miscellaneous Correspondence, Letter from Jr J. Hemp (artist), 27th September, 1872.
15. Public Records Office, VPRS 1074, Unit 18, Miscellaneous Correspondence 1860-1940, Letter from Mr D. Brown to the Honourable Sir J. McCulloch, Chairman of the Trustees of the National Gallery of Victoria, 16th November, 1874.
16. J. ANDERSON, "The First Cleaning Controversy of the National Gallery 1846-1853", Appearance, Opinion, Change: Evaluating the Look of Paintings, United Kingdom Institute for Conservation, 1990, pp. 3-8.
17. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1882, 'The Report of the Sectional Committee of the National Gallery', p.34.
18. Public Records Office, VPRS 4363, Unit 14, Miscellaneous Correspondence of 1882 in the National Gallery of Victoria, Letter from George Verdon to the Trustees of the Public Library, 16th August 1882.
19. ANONYMOUS, "Danger and Decay", The Argus, March 4th, 1899.
20. L.B. HALL, "To the Editor", The Argus, March 4th, 1899.
21. I. WHITEHEAD, "The Condition of the Pictures", The Argus, March 3rd, 1899.
22. ANONYMOUS, "The National Gallery Pictures - By one of the Owners", The Argus, July 15th, 1899.
23. Public Records Office, VPRS 4367, Unit 5, Letterbook of the Trustees 1891-1912, Letter no. 386 from the President of the National Gallery Committee Edward Langton, to the Director of the National Gallery of London, 31st May, 1899.
24. ANONYMOUS, "The Condition of the Pictures - Opinions of English Authorities", The Argus, July 8th, 1899. (In this article, the Conservator at Sydney's Gallery is noted from his meticulous treatment of their collection, which was based on the practice of the first director of London National Gallery", Sir Charles Eastlake.)
25. D. BOMFORD, "The Conservation Department of the National Gallery", National Gallery Technical Bulletin, 1978, p.3 - In a discussion with Mr Eric Westbrook, a former director of the National Gallery of Victoria, he talked about the fact that the scientific basis of formulas used in conserving artworks were "partly influenced by a bias towards science, post the war". He felt that the boom in scientific discovery that was born out of the post-war era, gave people new confidence with scientific practices. Interview with Eric Westbrook, 13th July 1992.
26. ANONYMOUS, "Restoring Paintings - Virtues and Vices of Chemistry", The Argus, August 27th, 1932.
27. Archives of the National Gallery of Victoria, "The Condition of the Pictures", Early National Gallery File; Box C - 1/4, Letter from Harley Griffiths to the Chief Secretary, 20th April, 1937.
28. Archives of the National Gallery of Victoria, "The Condition of the Pictures" Early National Gallery File; Box C- 1/4, Letter No. 39/528 from Harley Griffiths to the Trustees of the National Gallery of Victoria, 17th February 1939 - In this letter Mr Griffiths requested that his position of responsibility for the "restoration of [the] pictures should be made full time.
29. Archives of the National Gallery of Victoria, "The Condition of the Pictures", Early National Gallery File, Box c - 1/4, Letter No. 39/528 from

- Harley Griffiths to the Trustees of the National Gallery of Victoria, 17th February 1939.
30. Public Records Office, Report of the Trustees of the Public Library, Museums and National Gallery of Victoria 1939, 'Annual Report of the National Gallery, 1939, p. 36.
31. L.B. COX, The National Gallery of Victoria 1861-1968, National Gallery of Victoria, 1969, p. 212 - Sir Kenneth Clarke visited the NGV and was impressed by Harley Griffiths work and hence suggested that further training in England would be appropriate.
32. It is not stated in the NGV's Annual Reports what length of time Harley Griffiths spent overseas, but from conversations with his wife, and other people who knew him when he was working at the Gallery, it is clear that he had quite a lot of contact with Ruhemann and became very opinionated about his methods.
33. Archives of the National Gallery of Victoria, General Conservation File, Letter from Daryl Lindsay, Director of the NGV, to Horace BATTERY, 25th July 1954.
34. U. HOFF, Quarterly Bulletin of the National Gallery of Victoria, Vol. XI, No. 1, 1957.
35. A. SHORE, "Conservation of National Gallery Paintings", Quarterly Bulletin of the National Gallery of Victoria, Vol. VII, No. 1, 1953 (No pagination)
36. Morelands' Farmyard, undated, oil on canvas; 71.5 x 91.7cm, Boudin's Havre Harbour, undated, oil on wood; 32 x 40.8cm, Felton Bequest 1913, and J. Constable's West End Field's Homestead, c. before 1830, oil on canvas; 33.2 x 52.4cm.
37. State Library Archives, Annual Report of the Trustees of the National Gallery of Victoria 1952, p.5.

THE REPAINTING OF A KITTYHAWK AEROPLANE

David Keany
Conservator, Australian War Memorial

In 1992 George Bailey, David Hallam and myself embarked on research for the repainting of a Second World War, Curtis, P40E Kittyhawk fighter aeroplane. This research entailed the practical use of cross-sections to help identify the remaining paint layers.

The aeroplane was first used at Milne Bay in 1942 in a decisive fight against the Japanese invasion of New Guinea. It was repainted as a training plane after its return to Australia and then used as a mechanical training plane at Melbourne showgrounds till the end of the Second World War.

It was scrapped in the 1950s for a source of nuts and bolts for car enthusiasts. Most other Kittyhawks were scrapped for aluminium after the war. It was purchased by Nelson Wilson in the 1960s for restoration.

As preparation for restoration to flying condition, Nelson Wilson and his son Greg, had removed most of the aluminium skins (sheeting) on the wings and body. The aluminium was replaced with new metal. Smaller sections were not re-skinned. The old skins were kept and used as a pattern for the position of the rivet holes and shapes of the new skins.

The new and old parts assembled for the whole aeroplane were stripped to bare metal with paint stripper then repainted with,

1. Etch primer for aluminium
2. Primer surfacer for steel
3. Polyurethane 2 pack in olive green and pale blue¹

The aeroplane was brought by the Australian War Memorial from Nelson Wilson in 1992. The aeroplane had been three quarters restored and was in a semi dismantled state. The Kittyhawk arrived at the Australian War Memorial as a fuselage, the two wings and a large assortment of labelled pieces, wrapped in bubble packaging or in boxes.

The role of Conservation was to,

1. Help reassemble the aeroplane
2. Research the paint layers
3. Recommend a paint system and colours
4. Help repaint the aeroplane.

George started with cross-sections of paint samples from seams in the aluminium joins on the tail and other obviously original parts. The paint stripping was not thorough enough to remove all traces of original paint. Fabric samples were also available. There were arguments about whether fabric samples were original or not "Americans used yellow dope", "Australian's used red dope", etc. I did scraping back cross-sections on fabric and a metal inspection plate, both with many layers, suggesting they were original items with a long service history. I hypothesised theories and made comparisons of cross-sections, layers and different samples.

I went to Melbourne with the technology curator, John White to look at the original aluminium skins from the wings of the Kittyhawk. I met the son of the owner, Greg Wilson. I was now in the world of aeroplane enthusiasts. I had to hold my tongue. My fascination with aeroplanes ended when I was about 14 years old with a nicely detailed model of a Messerschmidt Me 262. It was important for me to develop some rapport with Greg. Fortunately he was also interested in contemporary art and in particular the new abstract painters in Melbourne. Greg had been working on the Kittyhawk aeroplane since he was a lad and knew where all the parts came from. Greg also planned to come to Canberra to help reassemble the Kittyhawk. Greg handed over more samples of fabric. He then explained the source of the fabric samples we had been studying at the Australian War Memorial. I was disappointed; the most interesting fabric sample was from a Kittyhawk P40M (1943-1944), a year or two later model. The other fabric samples were from the correct aeroplane but were

replacements as the original fabric had become unserviceable. The small aluminium inspection plate I had studied was apparently original.

The next day we went to another aeroplane enthusiasts house where the wing skins were stored. We inspected these panels on the back lawn and looked for

- red from the rondels
- pale blue on the underside
- "US Army" American star, and dark grey paint.

I took small samples of these paints and colourimeter measurements². No examples of the expected red or the pale blue were found. The underside of the wings where we expected to find pale blue had been exposed to the most weathering and the nitrocellulose paint had weathered away progressively, leaving only the earlier layers.

We arranged for four small wing skins from the upper surface to be brought to Canberra with Greg Wilson as he was coming to the Australian War Memorial to help with the assembly of the aeroplane.

The small wing skins were valuable when thoroughly studied. They were undeniably from the aeroplane and had all the layers of paint since manufacture. The curator wanted the now rebuilt aeroplane painted in the paint scheme used in 1942 during the Milne Bay battle. He had theories that the plane had been made for US Army, then painted for the British Air Force with British rondels with red centres, then the red centres were painted out in white, by hand. This was to avoid any confusion with the red rondel of the Japanese aeroplanes. He was pleased to find hand painted areas on the upper surface wing skins in the place corresponding to the correct spot for the British rondel.

I studied the wing skins under the low powered microscope (8x) and made cross sections of select areas³. David Hallam and George Bailey studied these samples and cross sections from other parts of the Kittyhawk using a high powered microscope and scanning electron microscope⁴.

The results were very clear. The plane was painted on the upper surface with:

1. Zinc Chromate primer, sprayed
2. Spray coating of green in a camouflage pattern
3. Spray coating of tan in the remaining areas unpainted in green.

One set of rondels were also spray painted at the same time as the original painting. First a wide blue ring, then a white disc inside the blue with a slight overlapping of the blue.

There was no evidence of red in the centre of the rondel. The hand painted rondel was definitely part of a repainting at a later date.

There were no original aluminium panels on the sides of the fuselage so we could not test the story of red rondels being painted out with white paint. George's studies had uncovered red paint on the tail fin so there was some evidence of the red paint.

Finding the pale blue colour expected on the underside of the plane was the next problem. The Wilson's had been very thorough in stripping the paint from the undersurfaces of the plane. The wings had been exposed to elements for 10 years upside down and the nitrocellulose lacquer had completely weathered off that layer.

We were getting to the stage of relying on hearsay, or even worse, books on the subject. I had an inspection plate, though Greg claimed it to be from a later plane. It had a good pale bluish colour that we though might do. I then started looking really hard for a pale colour with dark grey underneath.

I found a sandblasted inspection panel still with scraps of paint left. On the edges of the metal all the paint layers were still intact in a strip 5 mm wide. The layers were zinc chromate, dark grey, very pale blue. I scraped off the dirt layer and made a paint match under the low powered microscope (8x). I had trouble matching the pale blue. It is a difficult colour to match especially in Acrylic emulsion paints. A pale blue match was finally made that the curator and myself were happy with. The colour of the upper surface was easy to determine as there were good sample areas of paint on one of the small wing skins. This wing skin was given to Dulux to colour match to an acrylic lacquer automotive spray paint⁵.

The position of the roundels on the wings was the next problem. I presented the evidence to the curator after warning him that his theories might have to be changed. He was at first bewildered then settle down and accepted the evidence in front of him. I was amused by all the anxiety of the decision making, but later realised that aeroplane enthusiasts take the roundels positions very seriously. It is interesting that the paint surface is treated so seriously, similarly to a work of art. Unfortunately, often the aeroplane is thoroughly documented, then stripped and repainted to look new.

After working hard on this aeroplane and helping repray the whole aroplane⁶, it looks beautiful. The Kittyhawk is now displayed alongside a 1940s Spitfire still with its original war-worn paint surface. The spitfire looks tatty and neglected by comparison but is all original.

I used to think the Spitfire looked correct with all of its blemishes and exhaust blackening. My attitude has changed due to my close working in a "complete" restoration project. This attitude is quite natural and a result of pride in workmanship. Unfortunately, this same attitude has resulted in most historic aeroplanes being completely repainted, often removing all traces of the original paint surface and markings.

The Conservators at the Australian War Memorial managed to find enough traces of the original paint scheme of the Kittyhawk to ensure a faithful reconstruction was achieved.

Further conservation studies fo the paint surfaces of technological objects using recently acquired expertise may result in an increased respect for original paint on technological objects in the Australian War Memorial.

RERERENCES

1. Spartan two part epoxy paint.
2. Minolta Chromometer CR-100,
(National Museum of Australia)
3. Wild M1 low powered microscope.
4. Leitz Dialux 20 high powered
microscope
Cambridge Electron microscope

(Australian National University Electron
Microscope Centre)

5. Auto Colour Dulux Dulon AAA
6. Spray painter, Noel Brunne, R.A.A.F.
Reserve, Amberley, Qld.

SYMPOSIUM EVALUATION

Compiled by Stewart Laidler

Here are the collated results, taken from forty responses, to the evaluation conducted during the Robertson Symposium:-

1. Does the format of this conference suit you?

Yes	No	Not Sure
40		

What other methods could be employed?

More topics for discussion.

Discussion panels worthwhile.

Better projectors!

2. Are the topics relevant and useful for you?

Yes	No	Not Sure
39		1

Any suggestion for future topics?

Exhibition procedures.

Discussion of treatment issues.

A variety of topics (group too small for themes).

3. Does the style of venue suit you?

Yes	No	Not Sure
37	1	2

Any other suggestions?

Important for us to be all together.

The country is good.

Stradbroke Island? Mount Buffalo?

Regional gallery.

Travel time + additional cost incurred to travel to exotic rural location is onerous.

Room with toilet and bath.

4. Does the timing ie. Wed-Fri suit you?

Yes	No	Not Sure
24	11	5

Any other suggestions?

Over weekend (6).

Adjacent to a weekend (6).

Sun, Mon, Tues (2).

5. Does the frequency ie. every 2nd year, suit you?

Yes	No	Not Sure
37	1	2

Alternatives?

Once a year.

Alternate with other types of meetings such as "Articulate Surface".

6. Would you pay more money toward an overseas guest speaker?

Yes	No	Not Sure
20	6	14

Comments/suggestions?

Many qualified responses depending on amount of extra money.

Only if grant could be raised.

Cost beyond a small group.

Not often worth it.

THE FUTURE

1. Would you be interested in being involved in future planning committees?

Yes	No	Not Sure
19	11	9

2. In the future would you prefer: Please tick one

- a) the paintings group meet separately

31

or

- b) held as part of an AICCM National Conference

3

Comments?

Both ways(6)

Offer both in alternate years.

An effort should be made to get as many paintings conservators to AICCM National Conferences. Perhaps need to organise smaller sessions at joint conferences.

3. Do you see the Paintings Group performing other roles beside education and networking, eg:

Public awareness

Improving, relationships with other art professionals eg. Curators

International liaison

Yes	No	Not Sure
31	4	5
38	-	2
36	-	4

Other? – please list

Curators should be more openly invited to the meetings.

Practical work experience /specialist workshops (professional development courses).

These things should not away time from the main focus of our work.

Conclusions

In the discussions regarding this survey an overwhelming majority of people felt their interests best served by the paintings group holding separate meetings from the National AICCM Conference. However it was also recognised that the Paintings Group was a part of AICCM and that representation of the group at the conference was important to avoid any spurious allegations of "elitism" by other members of AICCM.

It was decided that the next Paintings Symposium be organised in or around Melbourne. Help with this was offered by several people from there.