

THE WINSTON CHURCHILL MEMORIAL TRUST

CHURCHILL FELLOWSHIP 2002

**ADVANCED TRADITIONAL STAINED GLASS
PAINTING TECHNIQUES,
AND
STAINED GLASS RESTORATION MANAGEMENT**

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Signed

Dated

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INTRODUCTION AND ACKNOWLEDGMENTS.

DUAL OBJECTIVES.

This three months 2002 Churchill Fellowship on Stained Glass Restoration had two separate but interrelated objectives.

The first was specific and very detailed, and concerns the advanced traditional glass painting techniques necessary to faithfully replace missing or shattered glass in historic stained glass windows. This part of the Fellowship was accomplished in two highly skilled glass painters' studios.

The second was much broader in its scope, and concerns stained glass restoration management. It investigates the best international restoration processes, procedures and practices which need to be employed for the preservation of Australian historic stained glass windows. This required the evaluation of our own, and general Australian studio practices and comparison of these practices with the world's best restoration studios. This part of the Fellowship was accomplished by visiting renowned studios in the United States of America, the United Kingdom and France, meeting and talking with custodians of historic glass, and by viewing restored glass in numerous sites.

This report treats these purposes separately. The description of:

GLASS PAINTING TECHNIQUES commences on page 12,

STAINED GLASS RESTORATION MANAGEMENT begins on page 17, and

OWNERSHIP AND CUSTODIANSHIP begins on page 27.

ACKNOWLEDGMENTS.

I begin by thanking the Churchill Fellowship Memorial Trust for offering me this opportunity to travel overseas in my quest to place Australian Stained Glass Restoration management, painting, procedure and practice in an international context.

I also wish to thank my referees – Bishop James Foley of Cairns, Max Bourke of Canberra, and Bronwyn Hughes of Melbourne, with special thanks to Bronwyn for her assistance in suggesting overseas studios to visit.

The success of the Fellowship trip would not have been possible without the unqualified welcome that I received in every studio we visited. We are indebted to those studios for the chance to observe and participate, and to exchange views, opinions, and techniques. We deeply enjoyed and appreciated meeting our international peers.

I also wish to thank my business partner and wife, Jill Stehn, who not only organised the whole trip before we left Australia, but who was also my invaluable colleague throughout the journey.

EXECUTIVE SUMMARY.

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Fellowship Objectives.

- To learn advanced traditional stained glass painting techniques in order to faithfully reproduce missing and shattered historic stained glass.
- To evaluate our own studio restoration practice, and that of general Australian restoration practices, against the world's best restoration studio practices.

Fellowship Highlights.

- Establishing that our own studio practice ranks amongst the worlds' best – in both our new and restoration work.
- Being in two glass painters' studios who each displayed extraordinary skill, and where I observed and learned the traditional glass painting techniques which had long eluded me.
- Being in restoration studios around the world where the primary concern was for the glass, the glass paints and the preservation of the original historic material. These studios also have the ethics, the process and the range of skills to undertake this demanding and highly specialised art. Meeting international custodians who have the knowledge, ability and information to ensure the correct and long-lasting restoration of their historic windows. They are the peers of Australia's best custodians.
- Meeting international custodians who have the knowledge, ability and information to ensure the correct and long-lasting restoration of their historic windows. They are the peers of Australia's best custodians.
- To see (and touch!) panels from Chartres Cathedral, St. Chapelle, Paris, St. Eustache, Paris, and from Le Mans – and all together on the one light box – in the Alliou's "Vitrail France" Studio.
- Seeing Australian glass restoration dwarfed by the scale of American restoration which, in turn, was dwarfed by the European.
- Entering St. Chapelle and Chartres Cathedral and being moved to tears by the sheer exquisite exhilarating beauty of the glass.
- A sizzling anger as we left the Cloisters Annexe of the Metropolitan Museum of Art. We had seen there many German roundels dated circa 1535 in which original paints, enamels, and even unfired cold paints were still in good condition. These panels had been treated with obvious skill and care. Our anger was intense because immediately prior to leaving Australia we had done a condition report on two large and significant 1920's German windows. Both should also have lasted centuries, but both are ruined, in our and others' opinion, as the result of their recent "restoration". Why is it that after five hundred and more years, overseas studios can still preserve their glass paints, while we destroy them after seventy?
Surely Australia can do better than this?

EXECUTIVE SUMMARY (CONTINUED).

RECOMMENDATIONS.

That Australia recognise the breadth, diversity and quality of its stained glass heritage.

That Australia does have specialist glass painters capable of faithfully repainting missing or shattered historic glass, and they should be employed to do so. Leaving repaired pieces of raw glass in sumptuously painted windows is no longer acceptable.

That at the very least no historic stained glass window be touched without first commissioning a written assessment of the window's worth and current condition by a knowledgeable architect, historian, conservator or consultant.

That a prospective restorer be asked to provide, in writing, their credentials for undertaking any proposed restoration. This should be in the form of a written and photographic record of previous works. If possible, the proposed restorer should nominate a nearby site where they have done previous restoration, and this site or sites should be inspected by the custodian, or an independent consultant, to ensure that the work is of sufficient quality.

That an appointed restoration studio should submit a written document with annotated photographs detailing their proposed works, and why the works are deemed to be necessary. The studio should nominate any particular problems they foresee with the window, what techniques they are intending to use, and what standards the restoration will meet. Where sub-contractors, such as acid-etchers or glass painters are to be employed, these are to be nominated prior to commencement of work and their credentials also forwarded.

That custodians take advantage of existing Australian skills by employing expert architects, historians, conservators, consultants and restorers as necessary to assist them in the management of their stained glass window projects before work commences. This is far more cost effective than finding that the window is improperly restored, damaged, or ruined after the restoration.

That there be a national effort by heritage and other interested organisations to provide restorers and custodians with guidelines on acceptable standards, processes, procedures and practices.

That restoration studios only undertake the level of restoration in which they are skilled. Leadlighters, for example, without extensive understanding of glass paint and its analysis and stability should not be touching stained glass windows – let alone using deleterious leadlighting techniques on them.

Our studio will assist in these tasks by:

- Continuing to conduct weeklong in-studio stained glass painting courses to pass on our painting skills to other glass painters.
- Using the best restoration documentation, practices, ethics and standards on restoration works conducted in our own studio.

- Continuing to assist custodians and governing bodies such as Heritage Councils, National Trusts, church authorities, and heritage architects achieve cost effective international standard restorations.
- Acting as consultants.
- Continuing to conduct in-studio restoration workshops for students and for custodians.
- Continuing to encourage good restoration practice in Australian restoration studios and their associations.
- Continuing to conduct guided tours of our historic windows.

THE OVERSEAS TOUR.

FORWARD PLANNING.

We wrote to the studios we wished to visit eight months before we left. We described the purpose of the Fellowship and our areas of interest. Mentioning the Churchill Fellowship was invaluable in this process, and every studio we approached accepted us. We formed our itinerary around the suitable times for studio visits.

Jill runs our business, orders all the materials, fires the kilns, and does the glass cutting, leadlighting, soldering and cementing. I do the designing, drawing, cartooning and painting. We jointly do on-site inspections, on-site removals and installations, restorations, and condition report writing. We decided to concentrate on our respective areas of expertise while overseas.

Having everything pre-booked – every flight, the hire cars in America and Europe, and all accommodation – was a very efficient way to travel.

The hired cars were excellent as they gave us the freedom and mobility to take up unexpected invitations to sites and studios not pre-planned.

PREPARATION AND EQUIPMENT.

Gifts.

We took gifts to all the studios we visited. These included books, CD-ROMS, booklets and post cards of Australian stained glass. These were warmly received as many overseas studios were unaware of the nature, extent, quality, breadth and universality of Australia's stained glass heritage.

People in England, in particular, were surprised by how much we knew about "their" 19th century stained glass studios and windows because our earliest Australian windows were made in, or by artists from, Great Britain.

We also received many kind gifts, including valuable books, during our travels.

Photo Album of Australian Practice.

We compiled an album containing 300 photographs of our studio, our new works, some examples of extremely good and extremely bad Australian glass painting, the problems we regularly encounter in restoring Australian windows, and of problems caused by studios using deleterious and ruinous restoration practices. This album was invaluable. International studios recognised at a glance our own studio's high level of skills with new and restoration work. Most studios responded in kind by spontaneously showing us their new works, and files on their restorations. They readily recognised our photos of "standard" restoration problems such as the breakdown of borax rich 19th century glass paints, as well as the substantial problems we face with unskilled restoration practices in Australia which they described as "weird", "bizarre", "obsolete", "disastrous" and "scandalous".

Equipment.

We knew that many of the major sites would have books and postcards of their stained glass windows, and which we brought back. We realised that the details of restorations we were looking for would not exist in these generalised photographs. We took a Pentax Espio 150 SL camera. We each took a pair of small high powered binoculars for close examination and analysis of details in restored windows. We also took a pocket 10X magnifying lens to allow close examination of painted surfaces and paint breakdown. Whilst overseas we took 900 photographs of windows and studio practice.

Brushes.

I took some of my best painting brushes. This ensured that the better results of my painting done overseas would be due to the new mediums and techniques, and not due to different brushes. This meant that my old brushes learnt new tricks.

ITINERARY.

The tour took three months. We spent a month in the United States, a week in Paris, a month in England, a fortnight touring through central France, and a week in Germany.

We visited five studios for a week each, ten studios for a day each, looked at restorations in numerous cathedrals, churches and chapels, and saw thousands of windows dating from the 12th to the 21st century.

Our itinerary was envied nationally and internationally. It was as follows-

MAY

Date	Place	City/town
UNITED STATES OF AMERICA.		
9	Holy Trinity Episcopal and Lutheran Evangelical – Exterior protective glazing.	Philadelphia, PA.
10	Our Lady of Czestochowa Shrine	Doylestown, PA.
11	Washington Memorial Chapel – Bell Tower and Chapel	Valley Forge, PA.
12	Holy Trinity Episcopal church, Lutheran Evangelical church, First Unitarian church.	Philadelphia, PA.
13-17	Willet Studio	Philadelphia
16	Partnership for Sacred Places, St. Mark's Episcopal church.	Philadelphia
19	Preliminary discussions with Dick Millard and Vicki Kearney.	Antrim, NH.
20-23	Dick Millard's Environmental Glass Studio All Saint's Church – Connick windows	Antrim Peterborough, NH.
24-25	Bill Cummings Stained Glass Studio	North Adams, MASS.
26	Arrived New York	New York, NY.
29	Cloisters Annexe of Metropolitan Museum of Art	New York.
30	Metropolitan Museum of Art	New York.
31	St Patrick's Catholic Cathedral	New York.

JUNE

- | | | |
|---|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 3 | St John the Devine Episcopal Cathedral | New York. |
| 5 | The Stained-Glass Conservation Studio of the St. Ann Center
for Restoration and the Arts – David Fraser.
St. David’s Episcopal Church. | Brooklyn,
New York. |
| 6 | Mary Higgins’ Stained Glass Studio | Brooklyn |

FRANCE

- | | | |
|-------|------------------------------------------------------------------------------------------------------------|---------|
| 8 & 9 | St Eustache church | Paris |
| 11 | St Denis church, Le Halles.
St Gervais church – including new Sylvie Gaudin windows.
St Denys church | Paris |
| 12 | St. Chapelle and Notre Dame | Paris |
| 13 | St Eustache church | Paris |
| 14 | Vitrail France Stained Glass Studio – The Alliou’s Studio | Le Mans |

UNITED KINGDOM.

- | | | |
|-------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 16 | Canterbury Cathedral | Canterbury |
| 17-20 | Canterbury Cathedral Stained Glass Conservation Studio | |
| 21 | St. Andrew’s Anglican church,
Anglican church,
Anglican church, | Wickhambreaux,
Barfrestone,
Bekesbourne, |
| 22 | All Saint’s Anglican Church – Marc Chagall windows.
Ashdown Park Hotel – Harry Clarke windows | Tudely
Wych Cross |
| 24 | Chichester Cathedral – including Marc Chagall window
Sherbourne Abbey – including failed Hardman 1850 windows. | Chichester
Sherbourne |
| 25 | St Mary’s Anglican Church. | Bampton |
| 26 | Chedworth | |
| 27 | St. Barnabas Catholic Cathedral (designed Pugin).
Anglican Church of St. Mary’s and St. Nicholas | Nottingham
Spalding |
| 28 | Lincoln Cathedral.
Visited Sub-Dean Rex Davis, Keeper of the Fabric.
Lincoln Cathedral Stained Glass Conservation Studio. | Lincoln |
| 29 | Rex Davis. | Lincoln |

JULY

- | | | |
|------|-------------------------------------------------------------------------|------------------|
| 1-4 | Barley Studios – Keith Barley. | Dunnington, York |
| 5 | St Andrew’s Anglican Church. | Redbourne |
| 7 | Preliminary discussions with Jonathan and Ruth
Cooke | Ilkley |
| 8-12 | Jonathan Cooke Glass Painting Studio
St. Margaret’s Anglican Church. | Ilkley |
| 12 | Private collector | Huddersfield |
| 14 | St. Denys church | York |
| 15 | Lucy Rutherford, York Glazier’s Trust, York
Minster. | York |

FRANCE.		
18	Cathedral of Notre Dame Church of St. Taurin.	Evreux
19	Royal Chapel – Sevres glass.	Dreux
20	Chartres Cathedral St. Pierres church Church of St. Agnin Centre Vitrail	Chartres
21	Notre Dame church	Senonches
22	Catholic church	Chenonceaux
25	De Pirey Stained Glass Studio	Allou, near Bourges
25	St. Etienne's Cathedral	Bourges
26	Trinity Parish church.	St Marin en Bresse
30	Notre Dame Du Haut	Ronchamp

AUGUST

GERMANY.		
1	St Sebald and St Lorenz	Nuremburg
2	St Jakob's Lutheran Church – F.X. Zettler windows St Francis' – New Schreiter windows.	Rothenburg
4	St. George church.	Kraftshof
5	St. George church. Wallfahrstbasilika	Ellingen Gossweinstein
6	Cathedral (Dom)	Augsburg.

KEEPING RECORDS.

Every evening we would discuss what we had seen that day, and complete our diaries. Jill would take my dictated notes in shorthand after busy days. These have since been typed. As soon as we had completed a roll of film we would get it developed in duplicate, number the photographs and notate them. This dual recording method has been invaluable.

RESTORATION GLASS PAINTING: REPAINTING MISSING OR SHATTERED GLASS.

Introduction: the challenge of restoration painting in an actual example from our records.

Vandals had recently been particularly destructive with a significant 1930's Australian window. During the first attack they had thrown rocks through the window. In a second attack they used something small, fast and shattering.

It was immediately apparent that the window would have to be removed to our studio, dismantled, the twenty-three missing and shattered pieces repainted to match the original, and the window then reassembled and reinstalled.

Examination of previous painting techniques requires exactitude. The damaged pieces were inspected after being dismantled. I look at one broken piece of costume under magnification and can determine that the original was painted on Hartley Wood flashed red mouth blown antique glass, that the paint is a bistre brown painted over a black trace line done with a wet water stipple of a light to medium consistency using a 4 inch badger brush, that the painter was right handed, that the highlights were cut back to the raw glass with a fine stick, and the piece then fired at 595 °C. I know how they did it, and I know I can match it almost perfectly. My skill extended to about three quarters of all painted glass imported into or made in Australia.

I can correctly analyse the techniques in the broken face. I see that there are four layers of paint, can tell which were done with gum arabic and vinegar, which with oil, how wet and workable each layer was before it was stippled – but there my knowledge stopped. I could not repaint the face the way it was originally done. What oil was the paint mixed in? Or even what combination of oils? What was its viscosity, its drying rate? What type of brush or brushes did they use...?

It was bafflement at these more intricate painting techniques which led me to apply for a Churchill Fellowship to learn these techniques overseas. I wanted to be able to use these techniques in our own studio and to disseminate this knowledge and skill to Australian glass painters particularly during our annual weeklong in-studio stained glass painting course.

Learning these traditional painting techniques.

Dick Millard: Antrim, New Hampshire, United States.

Dick Millard, with his partner Vicki Kearney, runs a two-person studio in the pristine New Hampshire woods. Dick was unstintingly generous in describing and demonstrating his techniques. All the descriptions in books pale into insignificance compared to watching a skilled artist, brush in hand, executing a work. Some techniques that I watched were:

a multi-layered water and gum arabic trace line technique that I had not done successfully before,

the use of a “spritzen” technique which I had previously approximated by using a wet stipple technique, and
 the use of sodium silicate as a medium in which many layers of glass paint can be applied within minutes, one on top of the other more or less indefinitely.

What was most illuminating, however, was a four layer/one-fire technique in which the “normal” order of paint application was reversed. I could only marvel at both the original painter’s skill, and Dick’s familiarity with it.

The first layer of paint was not the guiding trace lines but the shade layer which was applied using a small amount of gum arabic to give the paint adhesion. This shade layer was then stippled with soft deersfoot brushes to cut back the highlights – often to the raw glass. Given that Dick was demonstrating these techniques on a life size portrait without trace lines, this required considerable skill. When this ghostly shading was completed Dick then applied the defining trace lines over the first layer with ox hair brushes using a stiffer mixture of paint, gum arabic and water. This layer was applied with vigour and surety: there was no room for mistakes as any misjudgement in the line work would necessitate the removal of all the previous stippled under-layer, and starting the process again.

When both the matt and then the trace line layer were done to Dick’s satisfaction the next layer of paint was applied over both of the previous. This was applied as a thick, almost black layer of paint in an alcohol medium. This medium’s evaporative rate is prodigious and the application had to be done with just two quick and expert passes with a badger brush – any more badgering would result in lifting off both the previous unfired layers. This third layer allowed the strengthening of shadows around the hairline, around the eyes, nose, lips and neck which “normally” would require a second firing.

When satisfied with the stippled manipulation of this third layer of paint, it was fixed using three layers of shellac blown onto the surface with an atomizer. The fourth and final layer of paint was then applied. Because the three existing layers were raw paint and now quite porous, a base for the fourth layer of oil was made by brushing a layer of kerosene over the shellac. This final layer of glass paint was mixed in a medium of turpentine, and Venice turpentine was used as a binder and thickener as required. This allowed yet another tone to be added to the face – a little touch of direct painting under the eye brows, modification of some background light to throw forward a highlight in the hair, or a delicate touch to soften a lip. This oil layer had to be manipulated quickly and expertly as the kerosene base was always slowly evaporating.

Here at last was the illusive multi-layered one firing technique that I had seen so often in European, English and early Australian windows – and never been able to authentically reproduce. At any time each of the four layers and finally all four layers could be stippled or cut back before the firing. If, for example, a glisten of raw light was required in the pupils of the eyes, this could be done by cutting through each of the four layers to the raw glass.

Given that each layer of paint could be done using a different paint colour, considerable variation and subtlety could be achieved. To this could also be added a simultaneous firing of a rich yellow silver stain on the back of the glass.

The obvious advantage of these techniques to the original studio was that it allowed the artist flexibility and control, and it saved time, fuel and money.

While modern kilns have changed much of the economy of glass firing, I was delighted that I understood and could now reproduce many of the original techniques I was familiar with in Australia. This was a huge advance.

Jonathon Cooke: Ilkley, Yorkshire, United Kingdom.

Jonathan Cooke runs a two person studio with his wife, Ruth, in the Yorkshire Moors. (Is there something about glass painting that requires small intimate studios and partnerships, we were beginning to wonder?). There I found another series of satisfying surprises concerning glass painting.

It occurred to me after I had left Dick Millard's studio that while it was his personal preference to paint on a vertical light easel, many of the techniques I had seen in Australian and particularly English windows had used an oil medium on a horizontal surface. This could be seen in the way the wet paint had diffused after it had been stippled. I had wondered how Dick's techniques could be used on a horizontal easel to achieve the required results. I need not have wondered because all of these horizontally painted techniques were about to flow fluently off Jonathan Cooke's brush.

One of the first things that I noticed in Jonathan's cosy studio was that Australian and American stained glass is comparatively very, very young and that Jonathan's understanding of the techniques, methods, skills, mediums, paints, stains and enamels were more extensive than anything I had previously encountered. While the skills and knowledge required to reproduce Australian and American glass painting techniques needs to extend for about 150 years, doing so with European glass needs to span a millennium.

Here was a combination of art and glass history and a knowledge of methods of production that was both illuminating and thrilling.

I should not, therefore, have been surprised while watching Jonathan at work matching a broken portrait, to hear him say that "This underpainting has been rubbed back with a forefinger but definitely not with a thumb, that would be far too clumsy", or that "This highlight on this eyelid can only be achieved by rolling a blunt pad across it", or that "The only way to reproduce the flat flesh tone external paints that Kempe studios used is by using this hundred year old Oil of Tar" – as I say I should not have been surprised, but always was.

Even more astonishing was Jonathan's records of his painting techniques. We keep general notes on glass paints, firing temperatures, and result samples. But in neat notebooks in scrupulously small and tidy handwriting is a page describing every painted repair Jonathan has done. He also has an admirable collection of slide size tiles of glass stored in slide projector trays. These are records of previous experiments with endless variations and mixtures of paints, mediums, brushing techniques and firing ranges. This is exemplary.

Jonathan's preferred medium is Oil of Lavender. I had previously experimented with it without achieving his extraordinary results. His success relied on the use of Balsam de Copiaba as binder to the lavender oil which then gave the glass paint a solidity and control of the medium that I had always lacked. As Jonathan took me through the steps that he would use in the repainting of an historic face, I saw unfolding before my eyes precisely the techniques used on English and Australian stained glass faces which I had sought. This was confirmed when Jonathan used a set of dryish brushes to fold back a layer of oil, attend to some more stippling or cutting back through the unfired trace and shade layers underneath, and then re-fold the oil seamlessly over the modified areas.

As I watched my mind went to a piece of glass painted 120 years ago by William Montgomery, the exemplary Australian glass painter. The window is now in the Melbourne Hilton Hotel. I had repaired and repainted that piece twenty years ago, had approximated the techniques, and still have the glass fragments. I knew that I had just watched Jonathan do what Montgomery had done in his Melbourne studio 120 years earlier. I vowed that as soon as I returned home I would walk into our studio, pick out that piece, and compare it with the sample pieces Jonathan and I had been working on in Ilkley, and which Jonathan kindly fired for me to bring home. The techniques are identical.

Painter's talk.

When glass painters meet, we talk. In Antrim and Ilkley it was the same – brush sizes, types, styles, hairs, action, fluency and cost; glass paints, stains and enamels and their quality, production and availability; mediums and how they work, and “feel” on the brush; glass makers, colour matching, paint and stainability; idiosyncratic styles and techniques of past and current studios; hints and clues; stained glass history; on site removal and reinstallation techniques..... All these were discussed and noted in my pocket size notebook. It was unanimously agreed there was increasing difficulty in obtaining or improvising glasses, paints, stains and enamels with which to closely match missing or shattered original glass.

One of the most rewarding conversations with both Dick and Jonathan was the concurrence that, as restoring painters, we should not impose our style into a repainted piece of glass. This, of course, means that the restoration painter must not only be wholly conversant with all of the materials previously used, but must also replicate a familiarity with the technique, and the aesthetic of the original artist. When confronted with, say, a broken face done by a genius, this is some ask! It was also agreed that pushing our own techniques to such levels for, say, one replacement face and never having to again replicate the technique and style of that artist was often most frustrating.

Honoured.

I felt particularly honoured in both painters' studios. I had always used sable liner brushes for trace lines, but Dick's preference was for ox hair. Not only did Dick allow me to use his best brushes – a considerable privilege – but he presented me with a set of four ox hair brushes and a sample of a brilliant yellow stain as we left Antrim. Likewise, Jonathan allowed me to use his own “darling” brushes. Jonathan also presented me, as we left, with a set of brushes which included an English stippler and a particularly fine liner brush. He also insisted that I take some of his very limited

supply of a hundred year old Oil of Tar as was used by the Kempe studio in its early days – a gift as extravagant as it was generous.

Each night after being in these studios, I slept the sleep of contentment.

Universal repainting skills.

There were glass painters in every restoration studio we visited. I learned from and exchanged information with them all. There was a breadth of glass painting skills in the USA, UK and France which we do not see in Australia.

STAINED GLASS RESTORATION MANAGEMENT – PRINCIPLES, PROCEDURE, AND PRACTICE.

Introduction: What we encounter, and what should we do?

Jill and I enter a church with stained glass windows – it could be in a town or a city anywhere in Australia. We go in and find, much to our pleasant surprise, say, a highly skilled German F.X. Zettler window imported from Munich in 1890. It is a large triple light window depicting, say, the Nativity. We immediately recognise it as a Zettler by its style, fine draughtsmanship, luxurious use of glass colour, the skill of the craftsman, and the exquisite use of irreplaceable paints, stains and enamels. We notice the delicate pink blush on the cheeks of the Virgin, the fine rendering of the crib, and OH NO! – all the flesh tones on the face, hands and feet of Joseph are missing and the paint in the background sky, stable and straw is cracking and flaking off. We hurry outside to look at that light and find, by the presence of fresh leads and solder joins, that this light has recently been “restored”. We go back in and look carefully at this restored light, comparing it to the other two lights which haven’t been restored, and are dismayed and disturbed.

Just as original studios are identifiable by their studio practices so are restoration studios. We can recognise which studio has restored this light. It may be a studio that routinely dips historic windows in caustic soda which immediately removes all of the most delicate paints and enamels and leaves the remaining paints subject to corrosion. It could be a studio that applies epoxy and silicone patches over the inner painted surface of the glass, which is a practice universally condemned. It could be a studio which uses caustic baths and then uses a stove polish to blacken the leads but which also embeds the stove polish into the abraded glass paints making it virtually impossible to remove, and leaving the windows dark and sombre. It may be a studio that uses inferior alloyed hand rolled leads which, whilst cheap to produce, begin to fail within a few years instead of lasting a century. It could be a studio which energetically scours off the “dirt” on the outside of the window, not realising that it is external glass paint applied by the original studio to mellow the bright Australian light.....

(We estimate that these studios have done so much damage to historic glass that we could spend the rest of our working lives just repainting their damaged glass. That owners and custodians should be confronted by such a needless and expensive prospect immediately after a restoration is an absurdity).

We leave the church deeply unsettled – again. Here is another of our stained glass treasures which, in our opinion, is now needlessly ruined.

What to do?

Given the good condition of the two unrestored lights in the window we can see no reason why the third light was restored. We make the usual assumption, based on previous experience, that there is no documentation from the restorers as to why the window needed restoration. We assume the church custodians have been persuaded to undertake a restoration that did not need doing. We assume that the custodian is happy with the work and does not have the skill or the knowledge to understand what has actually been done to the window. We assume that the fund raising committee and the congregation are proud of their recent restoration, particularly as they have

been told by the restorer that the restored light is now bright not because of the loss of glass paint, which is the truth, but because the studio has very carefully removed all of that nasty dirt that has accumulated on the window over the decades. We also assume that the restoration of this first light will be part of a long term programme to later restore both the other lights when funding becomes available, and that the same studio will be re-employed. We hear later that the church authorities are so pleased with the restoration that they are recommending these restorers for work on more major Australian windows.

What to do? What to do? Our more or less continuous ethical dilemma about whether to approach the priest and the parish in such cases is acute and recurring. We are obviously interfering. Bringing what are to us unacceptable practices to the attention of the parish will obviously be upsetting. We know we will be accused of denigrating our “colleagues” in an attempt to get more work for ourselves. We don’t need the work: we care for our national heritage. Yet if we don’t intervene we know that the rest of that set of windows will be ruined. Without intervention the sequence of ruination of our historic windows will continue unabated. We have documented some sites where the extent of ruin of restored windows is 100%.

Although this example is a reconstruction it demonstrates what we too frequently see.

I decided to apply for a Churchill Fellowship to make sure that our own studio practice, and that of the best Australian restoration studios matches the best international standard. We also wished to gain international opinion on what we perceived to be the many unacceptable and deleterious practices used by unskilled Australian restorers.

COMPARISON OF AUSTRALIAN AND INTERNATIONAL RESTORATION STUDIOS.

The Family of Restorers.

Stained glass restoration is a highly skilled, uncommon, and very expert profession. Stained glass restorers are not found on every street corner. It was, therefore, rewarding during our overseas tour, to find ourselves amongst the Family of Restorers.

There are those Australian restorers and conservators who we respect, who use similar international standards and with whom we have long conversations. There are times when we would not have used a method which they have used – and vice versa. Nonetheless, all of the methods used are within the range of acceptable standards and techniques.

What we also saw internationally in restoration studios was a family of restorers using the same high quality techniques even though various studios had their own preferences and particular skills.

It was most reassuring to see that the skill levels of the best studios in Australia and around the world were as one in using international standards, ethics and techniques with one single purpose – to preserve our national and international glass for as long and as faithfully as possible.

Range of Restoration Work Seen.

We saw an astonishing range of old and new windows in situ and the variety of restoration techniques that had been used over the decades and centuries.

Of most interest, however, were the disassembled windows we saw being restored in studios. This allowed intimate examination of the problems associated with and the techniques being used on the windows, and which we fully discussed with the restorer working at the bench.

What we saw was:

Willet Studios. A dismantled Tiffany window which, in places, had nine layers of plating. We also saw the partial sugaring (= return of the glass to sand) of Tiffany glass, as well as paint breakdown on the enamels on the inner surface of the outer glass of the extraordinary double plated head.

Dick Millard. A range of historic American glass being repainted.

Bill Cummings. Some excellent infill repainting work being re-incorporated into a broken 16th century head from a Museum.

Metropolitan Museum of Art. A range of Medieval glass being repainted and restored by Mary Clerkin Higgins.

David Fraser. (Stained Glass Conservation Studio of the St. Ann Center)

Painting of plates and restoration of 16th century Mary Magdalene cycle of windows.

Mary Clerkin Higgins. Restoration of work in her own studio.

Vitrail France. (the Alliou's studio) Restoration work on windows from Chartres, St. Chapelle, St. Eustache, Le Mans and others.

Canterbury Cathedral Stained Glass Conservation Studio. Extensive remedial painting on plates to restore an early 17th century heraldic window.

Lincoln Cathedral Stained Glass Conservation Studio. Restoration work, including repainting faces and costumes from storm damaged Victorian window.

Barley Studio. We worked cleaning a 16th century window from Fairford Parish church, Gloucestershire; helped dismantle an IRA bomb damaged historically important 19th century Kempe window; reassembled and repainted part of vandalised Victorian window. The rest of the studio was working on other restorations, including releading, repainting and edge gluing.

Jonathan Cooke Painting Studio. Watching the redrawing and repainting of a considerable range of damaged and missing English and European glass.

York Glaziers Trust. Work being done on the restoration, reassembly and reconstruction of the "St William" window from York Minster, as well as close inspection of pristine 16th century Flemish enamel work in a window from Baliol College, Oxford, currently being restored.

De Pirey Stained Glass Studio. Restoration work in their studio, but particularly their documented "before and after" work on a window recently restored from Bourges Cathedral, which we later inspected at close quarters in situ. Also invaluable was seeing "before and after" documentation of their extensive and highly skilled restoration of the Sevres stained glass windows at the Royal Chapel at Dreux, which we had also earlier co-incidentally viewed closely.

We also saw, in the thousands of windows we inspected, a range of extremely good and very poor previous restorations, from which we also learned. Viewing these restorations through binoculars and finding information in pamphlets and books about when the windows were restored gave us a broad history of practices employed in restoration. There is no doubt that restoration practices are evolving and improving.

Finally, our tuppence worth on the controversial restoration of the Chartres windows, where many say that the newly restored windows should not have been cleaned as the windows are now too bright and no longer have on them the venerable patina of age. Our conclusion is the opposite – the panels we saw must be cleaned to preserve not only the glass paint but also the glass, both of which are corroding. Without the current restoration there will be no Medieval glass in Chartres. The glass itself is so corroded on its outer surface that it resembles the stonework surrounding it.

PROCESSES AND SKILL LEVELS IN INTERNATIONAL STUDIOS.

Historical context.

Knowing the studio that originally made a window is important historically and technically. Studios have idiosyncratic practices – such as the use or non-use of borax in their glass paints – which strongly influences the course of its restoration. Australian stained glass historians have much of this information at their fingertips.

The first studio we visited on our tour – Willet Studio in Philadelphia – has a very large library run by Helene Weis and her assistant, Susan. Their task is to record the works of Willet Studio, and to provide reference for the studio's artists. Their knowledge and records are comprehensive. Other international studios had similar historic resources.

Documentation.

Many Australian restoration studios do not document their work. This leaves the custodian almost defenceless if the restorer damages or ruins the window.

Using the Burra Charter and international guidelines as our model we document our restoration work before, during and after the project. What we do was dwarfed by overseas documentation which needs to cope with much larger and more complex projects. Some of the windows being restored were approaching the area of a tennis court. Each of these windows may have hundreds of panels, and many the same size. Each panel was tagged with its name and code to ensure it was reinstalled in its correct position. Panels were stored on large sliding trays which were also labelled.

Panels which had had pieces of glass removed for chemical analysis were likewise labelled.

Many windows were centuries old and contained many previous repairs, reconstructions and insertions. Elaborate codes were used throughout the documentation to denote original glass, original glass with crack, previous restorations, previous readings, interposed new painted pieces, and so on. These were often coded, as recommended by Corpus Vitrearum. Extensive benchside use is made of slides, black and white, and colour photos. Computers are ideal for keeping track of the process involved in large projects.

Skills available in restoration studios.

Any stained glass restoration studio can only be as good as its knowledge, skills, equipment and ethical approach.

The first question a restorer should be able to ask is – “What is the best course of action to preserve the fidelity and longevity of this window, light, panel or piece?”

A studio cannot do the best for the glass if it cannot consider all options. We have worked hard in our studio to master all the traditional skills required for restoration. These skills include documentation of the process, paint analysis, correct dismantling and releading procedures, edge gluing, copper foiling, releading, acid etching for replacement glass and overfired stains on our replacement pieces; use of cathedral paints, stains and enamels; painting on plates and double plating at will; faithfully repainting missing pieces; protective glazing; and window removal and reinstallation. We also stock a good range of traditional glass, paints, mediums, brushes and materials.

It was, therefore, like being “at home” to walk into studio after studio and to be familiar with the materials, skill levels, procedures, practices, standards and ethics being used there as a matter of routine.

Paint Stability.

Since the beauty and longevity of a stained glass window relies on the stability of the very thin layer of fused glass paint, establishing that stability before any restoration process commences was one of the paramount skills in most studios. It was universally agreed that a defining moment in any stained glass restoration was the initial on-site inspection of the glass paint. This examination, often with the aid of a 10X magnifying lens, reveals the materials, mediums, brush techniques and firing temperatures used by the original studio. It also establishes the condition of the glass paint after its decades or centuries in situ.

All subsequent decisions concerning the path of a restoration were determined by that original on-site paint analysis. Later and better in-studio inspection with reverse lighting and high resolution lenses may add further information, but the original on-site inspection was rarely incorrect. This first inspection may establish that the glass paint is so fragile that the inner painted surface must be protected during removal, and that – after releading – putty is not to be applied to the inner painted surface because the putty would embed in it and attack the fragile glass paint. These requirements are documented and any special techniques are costed into the project at its commencement.

Chemical Analysis.

Enviably, many overseas studios used accessible and knowledgeable chemical analysis laboratories. The deep red stain in the 1820 Collins windows at Redbourne in England was found to have been greatly assisted by a 1.8% presence of silver in the glass. This was established when Keith Barley, who restored the windows, sent a sample of the original glass for analysis. In France the accretions on the inner surface of the Chartres Cathedral windows were being chemically analysed to assist with the best and least deleterious methods for its safe removal.

Such chemical analysis is also required in Australia, particularly when previous undocumented, experimental and/or deleterious practices have been used during restoration. If we discern that some deleterious substance may have been used on a stained glass window we ask the classic questions:

What is it?

What is it doing to the glass paint?

Who put it there?

Can it be removed?

Would it damage the glass paint doing so?

Chemical analysis is often vital in establishing what a restorer is dealing with.

While studios readily acknowledged the assistance chemical analysis offered it was also clear that, finally, it was the skill and integrity of the restoration studio which was going to preserve the windows.

Cleaning.

Any substance applied to or accreted on the surface of glass paint should be removed. Over zealous cleaning using abrasives or chemical compounds or both can remove glass paints and enamels with ease. Great skill is employed by skilled Australian and overseas studios in assessing how much material can be safely removed, and how this is to be done. It is mostly done Oh so slowly and Very carefully on light boxes using no more than de-ionised water and cotton buds, and cannot be hurried.

In every studio we visited the cleaning of the glass was always the longest and most labour intensive part of the restoration process. It was recognised that the longevity of the paintwork was almost entirely dependent on the cleaning process.

Edge Gluing.

Many historic windows restored more than fifty years ago clearly reveal the areas where the glass pieces had been broken. A myriad of prominent repairs using large leads now obscure the original painting. This is particularly distracting in details such as faces and hands.

The edge gluing of broken pieces of glass allows the removal of such mending leads. The glass piece is then releaded into the window almost as it was when it left the original studio. Glass broken centuries ago can now be reinstated. Even more advantageously, very skilfully painted new infill pieces replacing missing fragments of glass were being edge glued into the original broken pieces.

The three glues most frequently used were:

- **Hxtal NYL 1.** This glue was developed for the gluing of glass for museum conditions. Its refractive index means that the joined glass crack almost “disappears”. It is consequently often used in stained glass restoration in areas such as broken faces where cracks are most distracting. There appears to be no standard estimate of its life in architectural glass and further empirical evidence needs to be gathered. Estimates range from a few to forty years. It is well known that to extend the longevity of the glue the piece of glass or even the whole window has to be clear plated.

- **Araldite 20/20.** This adhesive, although not as fine as Hxtal, was being widely used because of its greater longevity. Since returning to Australia we have found it is not available here because “it contains a chemical that is listed on the restricted/prohibited chemical register”. (Pagliarino, Amanda. “The Availability of Adhesives for Glass in Australia”. AICCM March 2002 Newsletter).
- **Silicone.** Many studios were using Silicone because of its greater longevity even though its refractive index meant that cracks where the glue had been applied were still quite visible.

Despite this widespread use of edge gluing, there are recognised limitations and reservations about the practice. Protective glazing or clear plating was almost always required. Protective plating introduces other difficulties. We saw a 16th century German “Crucifixion” stained glass roundel which had been edge glued fifty years ago. A clear glass external protector had been fitted into the same lead. The edge glue had failed and split open many years ago, allowing moisture to enter the interspace. The glass in both pieces is now decomposing. Similar traits are visible in an Australian restoration done only five years ago.

It was recognised that any glue would not last anywhere near as long as traditional leading materials. Some studios were anticipating the breakdown of the glue and were inserting physical supports to hold the glass pieces in place after the glue failed. We have seen epoxy resin repairs in New South Wales and Queensland breaking down in less than ten years. Generally speaking it seemed that edge gluing, and particularly Hxtal, is an ideal method of repairing broken glass in those places such as the Cloisters Annexe of the Metropolitan Museum of Art where the windows are easily accessible, constantly monitored and well maintained. The success of using these “museum” techniques in difficult to access and exposed architectural glass is, in our opinion, not yet well established.

When it was irrefutable that glass paint had reached the end of its life, was falling off the glass, and could not be stopped, a last desperate effort to save it could be made. A thin layer of B72 epoxy was sprayed onto and into the paint to fix it to the glass. This may extend the life of a piece by forty years. It was recognised that when the epoxy failed, the paint would be lost. This technique is not reversible and is used in only the most extreme of circumstances.

Repainting missing and broken glass.

Despite the considerable use of edge gluing, we were very surprised by how much repainting there was of broken pieces. Most studios had the skilled artists who could successfully execute such work. We saw shattered glass – and particularly faces – being repainted as plates or new pieces at Dick Millard’s, Bill Cummings’, The Metropolitan Museum (Mary Higgins), Conservation Studio of the St. Ann Center (David Fraser), Vitrail France, Canterbury and Lincoln Stained Glass Conservation Studios, Barley Studios, Jonathan Cooke’s and York Glazier’s Trust. This is less frequently the case in Australia where there are only some restoration studios with the necessary skills.

It was usually the case that where a window was being returned to the weather without protective glazing, broken glass was being repainted. This was because it was known that the repainted piece – being made of and incorporated into traditional time

tested materials – would not cause premature failure in the window, and unnecessary future expense for the custodian. A very discreet artist's signature and date were visible on the repainted piece so future restorers would know it was not original. The unused pieces of original glass were returned to the custodian for storage with the hope that future technology may be able to repair and reinstate the original glass.

Re-painting on Plates.

When glass paint starts breaking down on the inner surface of a piece of glass there is a method of painting on a separate piece of clear glass the same size as the original, and plated onto it. This rectifies the loss of paint but does not touch the original historical material. This process was not as widely used as we anticipated for three reasons:

- The first was the problem of fixing a new plate to an old window;
- The second was the problem that, while the plate may currently remedy areas of paint breakdown, further future paint breakdown would become visible requiring a progressive succession of pieces to be repainted and replated; and
- Third, that there was always the problem of parallax error which often produced an unintentional and unfortunate double image.

Safety.

In general, overseas studios are more aware of health and safety issues and are far better equipped. Many but not all safety concerns revolve around the problem of lead poisoning.

Lead.

Lead in its solid state was regarded as "safe", provided thorough personal hygiene was observed. Atmospheric lead generated during the soldering process, and while dismantling old windows, where there is basic lead carbonate on the surface of the old leads and/or white or red lead mixed into the putty, represent a health hazard. Melting vats of lead for calmes in studios was deemed dangerous and unacceptable.

Extensive use of lead filtering vacuum and extracting systems is prevalent not only in public studios but also in smaller private studios. Every studio had such equipment.

An outstanding example was Bill Cummings' studio in North Adams, Mass.

Each employee in the studio had clean work clothes and shoes provided daily by the studio, which they changed into when they arrived at work.

At the end of each day the employees showered and washed their hair in the studio, and their work clothes remained at work and were washed.

Each male had lead blood levels done once a year. Each female had them every six months.

Correct lead filtering face masks were used during soldering and dismantling windows. Each bench had an elephant trunk extractor.

A separate room was dedicated to the dusty business of dismantling windows. All air in the room was extracted and filtered every 8 minutes.

The studio was wet mopped every day.

Australian studios – including our own – lag behind such exemplary standards.

Powders.

Powders such as whiting dust during puttying, and powders used on kiln trays, were immediately removed with on-bench vacuum cleaners.

Acid-etching.

We acid etch glass with the deadly hydrofluoric acid. This process is regarded as by far the most dangerous technique used in stained glass studios. We use it in a closed fume cabinet with an exhaust fan, running water, and immediately available neutralisers. Most overseas studios also use well equipped cabinets, which allows quick and safe access when etching is required to modify flashed glass, or remove over staining from replacement pieces. The use of sand blasting as a substitute for acid etching was not acceptable as it is not a traditional technique, and it produces a finish far too vulgar for restoration work.

Copper Foiling.

We saw examples of exquisitely fine copper foil repairs to previously broken pieces of glass. There was some concern, however, that copper foiling, by the very nature of its process, may damage fragile paint work. In high, large windows fine copper foiling, like fine leading, is virtually unnoticeable.

Re-leading.

In studio after studio we saw racks of conservation grade leads in an extraordinary range of profiles. Again, the demands of large American, English and European restorations has produced this enviable supply of materials.

On-site Removal and Reinstallation of Windows.

It was universally agreed that window removal would be much simpler – and much more original glass could be saved – if well established window fitting conventions were obeyed. This is particularly true with stone-set windows.

We have always removed and later reinstalled the windows we restore. Most overseas studios also had their principal conservator on site assisting with and supervising removal of windows. We sometimes use a team of four. The maximum team we heard of overseas was seven – with any more workers the supervisor felt that control over on-site documentation and the removal process was being compromised.

Protective glazing.

Protective glazing is generally required in Australia to protect windows against hail damage and vandalism. Older windows overseas have different and more complex requirements. We kept good photographic records of the various methods of protective glazing. Universally the un-vented interspace between the protective glazing and the stained glass window was leading to premature decomposition of the leads.

Have Skill – Will Travel.

Many people, particularly those in England, found it incomprehensible that our studio's geographic coverage for work was from Cairns to Melbourne. This, they realised, is the same coverage as from Edinburgh to Istanbul.

Like us, however, all studios were also covering the length and breadth of their own countries with many also travelling internationally to procure new and restoration work. Custodians wanting the best work are prepared to employ the best skills irrespective of distance.

International Comparisons.

Sweeping national generalisations are fraught with danger. There are French restorers in America and there are German restorers in England.

Generally speaking, however, the American system of restoration practice is most similar to Australia's. The catch cry for custodians is *caveat emptor!* The best trained, most skilled and most ethical American studios are acutely aware of how much of their heritage is being placed in the hands of unskilled studios.

The long existence of the British Society of Master Glass Painters in England has allowed the nation's most skilled and concerned restorers to establish their five tiered system of accreditation. This system distinguishes between those with basic leadlighting skills and those with the highest historical restoration and repainting skills. It affords the custodians in England the opportunity to use accredited studios which have the appropriate and verified skills for that particular restoration.

French churches are owned by the nation, and the restoration of the windows is administered by a bureaucracy. A bureaucracy appoints the restorers. This system would be ideal so long as the bureaucracy has the requisite skill and competence to administer their brief.

OWNERS AND CUSTODIANS.

Custodianship – an unenviable task.

It is the role of the restorer to use a range of skills, knowledge and ethics to ensure the best techniques are used to preserve historical stained glass.

It is the role of the custodian, with assistance from architects, consultants and conservators as appropriate, to employ those restorers who use those best techniques.

We saw internationally that being a custodian was a difficult and unenviable task. We believe that task is even more difficult in Australia.

Thirst for Knowledge.

It is our experience that most Australian custodians are eager to ensure that their restorations are timely and expertly done. Custodians are keen to know what to do, but it is our opinion that the quest for information is often thwarted by bogus reports and the promoting of misinformation and convenient myths by unskilled studios. Even worse, many custodians are misled by other “inexpert” custodians who recommend restorers who ruin Australia’s historic windows. Those custodians who have sorted the wheat from the chaff, and have supervised a successful restoration deserve very high praise. May future generations thank you!

We wanted, therefore, to investigate how international custodians established which restorers to use, and how they monitored the results of their restorations. We spoke to Jay Blossom from Partnership for Sacred Places in Philadelphia, Lisa Piloni conservator for glass at the Metropolitan Museum of Art, New York, and Alice Freylinghausen, also from the MET, and Rex Davis, Subdean and Keeper of the Fabric at Lincoln Cathedral in England, amongst others.

The common thread amongst these custodians was their knowledge and familiarity with the process and the requirements of good restoration. We particularly found organisations like the Partnership for Sacred Places in Philadelphia and the Council for the Care of Churches in the United Kingdom were pooling their resources and knowledge of previous restorations in an effort to ensure they were employing good procedures and studios. This process could only be as successful as the collective expertise of the group.

Knowledge is power.

Our first meeting with an overseas custodian was serendipitous, and was at the First Unitarian Church of Philadelphia. We explained to a parishioner that I was a Churchill Fellow and she introduced us to Richard Fry, another parishioner. It was over an hour before we left. Richard took us on a detailed tour of every window in the church. He knew the donors of every window, the studios that made the windows, a brief history of the life and work of the studios, their relationships with the donors, who the architect was, the relationship between the architect and the studios and the donors, the years in which the windows were installed, the current condition of all the windows, which windows had been removed and restored and why, the problems

encountered during those restorations, the windows that still needed to be restored and why, what techniques would be used on them, the order in which they would need to be restored, how much it was going to cost, and how they were going about fund raising.

Now that is custodianship!

Comparisons between this first overseas encounter and with previous encounters in Australia are not reassuring.

Many Australian custodians do not know the critical difference between leadlight and stained glass.

This leads to tangles like this –

A government department, supposedly acting within its own state purchasing policy guidelines, recently commissioned what was, in our opinion, essentially a leadlight window for which it paid stained glass prices despite the fact that its own Brief required that the window be fully painted and stained and should not be a leadlight. Successively a Project Manager, a “reputable advisory group”, the Chair of a Selection Committee, a Director of the Department, a Minister, and a Premier’s Department have, in our opinion, not known the difference between leadlight and stained glass as their own Brief required, and upon which the project and contract hinged.

And to restorations like this –

We were recently in a church looking at the historic windows when the clergyman arrived, and spent some time waxing lyrical about the genius restorer they had employed on some of their windows. The restorer, it seems, had quoted \$2,500 for the restoration but when he removed the windows to his studio he then “discovered” they were French 15th century windows and would require \$16,000 to restore them, which was paid. The windows appear to me to be local 1890’s windows of late Victorian designs and, in my opinion, have been devalued by the practices employed by the restorer.

The conclusion from this comparison between international and Australian custodians is self evident. We call it the institutionalised ruin of our stained glass heritage.

Group expertise.

It was common overseas practice for the owner/custodian to work with a group of up to four experts – a conservator, an architect (either of who may have assisted in writing the brief), an historian and the restorer. It was generally thought that such a team brought a breadth of experience and knowledge to a project. There was certainly more consultation and communication between custodians and restorers than we have seen in Australia.

In another serendipitous moment whilst we were at the Metropolitan Museum of Art we were invited to be present at the formal reception of a set of circa 1860 stained glass windows from the Packer Collegiate School (formerly in St. Ann’s church) being accepted by the museum. Looking at it from an American glass historical perspective was Alice Freylinghausen, Curator, Department of American Decorative Arts; from the museum’s conservator’s perspective was Lisa Pilosi, Curator of Glass;

from a restoration practitioners point of view was Mary Higgins; and from a formal administration viewpoint was Ann Carter, Receiver. A storage expert was also present to consider acid free safe crating of the windows until they could be restored. From the level of the discussion, from the inspection of prior documentation, from the understanding of the historical and aesthetic worth of the windows, and what needed to be done to conserve and restore the windows, we realised we were standing in the presence in one place at one time of more understanding of stained glass conservation and restoration than we had seen anywhere in Australia.

Australia does have this level of expertise amongst architects, stained glass historians, conservators and restorers, but it is under-utilised.

The Absence of Specific Australian Stained Glass Standards and Guidelines.

There are NO specific Australian Standards or Guidelines concerning stained glass restoration. The final recourse against faulty work is the courtroom. Any person with absolutely no training can print a business card, call themselves a “restorer” or “conservator” and have a priceless Australian stained glass window in their “studio” within a week.

Australia does have the Australian ICOMOS Burra Charter. It is a broad set of guidelines and principles for conservation and restoration work which was well known and highly respected overseas – indeed it was better known in overseas stained glass studios than it appears to be in restoration studios in Australia. Adoption of the principles set out in the Burra Charter at least gives owners and custodians a logical, sequential and methodologically sound approach to the steps required in a well researched, well documented and well executed restoration.

Restoration work done on Heritage listed buildings must comply with State legislation and guidelines. This at least means that those working on listed buildings must submit documentation of what they are about to undertake, and gain approval. Again, this gives owners and custodians some control and authority over stained glass restoration done in listed buildings.

Specialist groups such as the Australian Institute for the Conservation of Cultural Material (AICCM) have technical expertise as well as an exemplary set of ethics.

Other Countries’ Standards and Guidelines.

Australia must, therefore, currently utilize other countries’ specific Standards and Guidelines for technical and procedural standards for stained glass restoration.

The Stained Glass Association of America has a very useful set of Standards and Guidelines for the Preservation of Historic Stained Glass. The Comite Technique of the Corpus Vitrearum has a set of Guidelines for the Conservation of Ancient Monumental Stained and Painted Glass.

The British Society of Master Glass Painters has an exemplary “Code of Practice” which should be read by all restorers and custodians. As previously mentioned they also have a five tiered accreditation system which assists custodians in employing those studios with the skills commensurate to the restoration at hand.

These international standards and guidelines are intended to improve and guide restoration standards. The best Australian studios can and do use them to improve and monitor their own practices. Owners and custodians of our stained glass heritage could also use them to ensure that their restorations are to these international standards. Reference to such Standards can be included in a contract.

Cost alone as a criterion for appointing a restorer.

Internationally there is not enough money to properly restore all windows. We visited a church in York in which there was a plea for donations to keep the church open. There were holes through the stained glass windows, and no work in progress. We saw a restoration of a 16th century window in France that was stuck in mid-course for want of funding.

Cost saving as the guiding principle for the employment of restoration studios, however, was universally condemned as this almost always implied the studio was using inferior materials, low skills and unacceptable techniques.

This overseas experience is reciprocated in Australia.

An example of “cost saving”.

Caustic soda, as many people who have restored old skirting boards and doors know, removes paint and putty. In the construction of stained glass and leadlight windows linseed oil putty – called “cement” in the trade – is forced between the H shaped leads and the glass inserted into them to stiffen and waterproof the windows. It is not unusual for this putty to be tenaciously attached to the glass even when the leads and solders have fatigued and lost their structural strength. The putty, of course, needs to be removed from the glass before re-leading can commence. This is correctly done by removing it from both sides and the edge of every piece of glass using a hand held blade. Care must be taken at all times to ensure that neither the blade nor the removed putty is taking any glass paint with it, or that the glass is not being chipped or spalled. This is slow, tedious, demanding, dirty, repetitive and a highly skilled task. It is labour intensive and costly, particularly when some restorations contain literally thousands of pieces of glass.

The easy and profitable way is to soak the window in a caustic soda bath for a few days. When the window is removed, hey presto! all of the putty is gone, and dismantling the window is now very quick, and the glass is clean and ready to relead.

The caustic also attacks the glass paint. Fragile paint and lower firing enamels are removed almost immediately. Rare and irreplaceable paints requiring high skill in application – such as Jean Cousin rouge – vanish. Even seemingly sound paint, and especially that containing borax, can be penetrated by the caustic, which may be reactivated by moisture, and the glass paints recurrently attacked. Sometimes the paint loss resulting from caustic soda dipping may not be seen for months or even decades.

Using caustic allows such studios to undercut the project cost of skilled restorers by as much as 40%. On a cost basis such studios are re-employed. The windows, however, are ruined. This, surely, is false economy.

Overseas studios were aghast at the photos we showed of the results of such practices which had been discontinued overseas decades ago.

The Universality of the Shark.

There are many reasons why a person might choose a career restoring windows. Some do it for the money and maximise profits by using low skills, high expedience, and with little regard for the glass. Some do it to feel important. Some care passionately for the glass, and will go to great lengths to preserve and honour it.

We left Australia believing that we were the only country ruining our stained glass heritage. It was, therefore, reassuring – in a sour and bitter sort of way – to go into the first highly respected church on our tour to view their large prominent imported 1850's German window. We were shocked. As we had repeatedly seen in Australia, parts of the window had been restored and parts were in original condition. In those restored areas the paint had vanished. And we thought this only happened in Australia!

We quickly learned that the “salesmanship” used in Australia is also used worldwide. Credulous custodians everywhere believe the same stories – “the windows are buckled, are dangerous, are about to fall in on the congregation, by the way are you insured and do you have good public liability coverage in case you are sued for glass falling and injuring or even killing someone – fortunately for you our studio can quickly solve the problem by immediately removing and restoring the window.....” This was the most powerful universal selling ploy, based on fear and bustle, and upon which there are many variations.

Like ourselves, the best international studios are dismayed when they see their precious windows “restored” under these conditions.

Percentage of Fully Skilled Stained Glass Restoration Studios.

Our estimate is that, in Australia, there are perhaps ten restoration studios working to international standards, and who have the skill, ethics and care required for the proper restoration of our historic stained glass windows.

There are, perhaps, a hundred leadlighters and glaziers in Australia who earn some or much of their income from restorations and who, in our opinion, do not have the skills or knowledge to be undertaking those restorations.

There are, perhaps, a thousand ardent amateurs who would, if given the chance, restore our historic windows and would run a very good chance of ruining them. One was in our studio buying materials a few days ago and, seeing a large – but dirty – fabulous 1922 Australian window asked if we would clean it with acid. And they do!

These sorts of percentages, as well as the resulting problems, were also mentioned in the countries we visited

CONCLUSION.

We returned from the Churchill Fellowship tour exhilarated, invigorated and brimming with confidence.

I had seen demonstrated and had done those complex traditional stained glass painting techniques that had always eluded me. These new skills – along with the skills I already have – means that I can now faithfully repaint almost any piece of traditional stained glass ever imported into, or made in, Australia.

We had been to many of the world's most highly regarded stained glass restoration studios and had learned that our own studio practice and skills were of their standard, as were those of the handful of other highly skilled Australian restoration studios.

There are an increasing number of Australian custodians of a quality of those we saw overseas and who are striving to ensure that their historic stained glass windows are faithfully restored. They rest contented knowing that their restored windows should not need to be touched for at least a century.

Regrettably, far too many priceless, irreplaceable, beautiful, luminous stained glass windows are still being placed in the hands of restorers who will irreparably damage or ruin them.

RECOMMENDATIONS.

That Australia recognise the breadth, diversity and quality of its stained glass heritage.

That Australia does have specialist glass painters capable of faithfully repainting missing or shattered historic glass, and they should be employed to do so. Leaving repaired pieces of raw glass in sumptuously painted windows is no longer acceptable.

That at the very least no historic stained glass window be touched without first commissioning a written assessment of the window's worth and current condition by a knowledgeable architect, historian, conservator or consultant.

That a prospective restorer be asked to provide, in writing, their credentials for undertaking any proposed restoration. This should be in the form of a written and photographic record of previous works. If possible, the proposed restorer should nominate a nearby site where they have done previous restoration, and this site or sites should be inspected by the custodian, or an independent consultant, to ensure that the work is of sufficient quality.

That an appointed restoration studio should submit a written document with annotated photographs detailing their proposed works, and why the works are deemed to be necessary. The studio should nominate any particular problems they foresee with the window, what techniques they are intending to use, and what standards the restoration will meet. Where sub-contractors, such as acid-etchers or glass painters are to be employed, these are to be nominated prior to commencement of work and their credentials also forwarded.

That custodians take advantage of existing Australian skills by employing expert architects, historians, conservators, consultants and restorers as necessary to assist them in the management of their stained glass window projects before work commences. This is far more cost effective than finding that the window is improperly restored, damaged, or ruined after the restoration.

That there be a national effort by heritage and other interested organisations to provide restorers and custodians with guidelines on acceptable standards, processes, procedures and practices.

That restoration studios only undertake the level of restoration in which they are skilled. Leadlighters, for example, without extensive understanding of glass paint and its analysis and stability should not be touching stained glass windows – let alone using deleterious leadlighting techniques on them.

Our studio will assist in these tasks by:

- Continuing to conduct weeklong in-studio stained glass painting courses to pass on our painting skills to other glass painters.
- Using the best restoration documentation, practices, ethics and standards on restoration works conducted in our own studio.
- Continuing to assist custodians and governing bodies such as Heritage Councils, National Trusts, church authorities, and heritage architects achieve cost effective international standard restorations.
- Acting as consultants.
- Continuing to conduct in-studio restoration workshops for students and for custodians.
- Continuing to encourage good restoration practice in Australian restoration studios and their associations.
- Continuing to conduct guided tours of our historic windows.

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