

# **STAINED GLASS**

## **Conservation and Restoration Research and Workshop Practice in USA Britain and France**



**Report by**

**Bronwyn Hughes**

**January - February 1994**

**July 1994**

## CONTENTS

<b>Introduction</b>	<b>5</b>
<b>Support and Sponsorship</b>	<b>7</b>
<b>The Study Program</b>	<b>8</b>
<b>Definitions</b>	<b>9</b>
<b>Conservation Centres:</b>	<b>10</b>
<b>Small Private Studios</b>	<b>10</b>
Stained Glass Associates	10
Daniel Maher Stained Glass	10
Mary Clerkin Higgins	10
Chapel Studio	12
Roy W Coomber	13
<b>Museum Conservation Departments</b>	<b>15</b>
Corning Museum of Glass	15
The Cloisters: Metropolitan Museum of Art	16
Victoria and Albert Museum	17
<b>Cathedral Studios</b>	<b>18</b>
The Cathedral Studios (Canterbury)	19
York Glaziers' Trust	20
Le Centre International du Vitrail	23
<b>Documentation</b>	<b>26</b>
Census	26
Specifications	27
Documentation of Processes	29
<b>Restoration Techniques</b>	<b>30</b>
Adhesives	30
Cleaning	31
Protective Glazing	32
Painting	34
<b>Education and Training</b>	<b>34</b>
Formal Courses	34
'On-the-Job' Training	35
Short Courses	36
<b>Registration and Accreditation of Stained Glass Conservators</b>	<b>36</b>
<b>Outcomes</b>	<b>37</b>

## Appendix

- 1 Itinerary
- 2 Mary Clerkin Higgins, 'Harry Clarke and his Geneva Window', *Stained Glass*, Spring, 1993
- 3 Books on Glass
- 4 Victoria and Albert Museum: Organisation of Conservation Departments
- 5 Royal College of Art/V & A Conservation Course Information
- 6 Notes from the Bourges Conference by Stephen Clare
- 7 Census of Stained Glass Windows of America: General Information and 'An Owner's Guide'
- 8 CSGA: Guidelines for a Restoration Campaign of Stained Glass
- 9 CGSA: Direction for Census Forms
- 10 Plan of Windows in Harvard Memorial Hall
- 11 Pro forma: Profile of a Studio
- 12 V & A: Stained Glass Condition Report and Treatment Record
- 13 Canterbury Cathedral Studios: Site Survey
- 14 Canterbury Cathedral Studios: Documentation of Conservation
- 15 V & A: List of Conservation Materials
- 16 V & A: Bibliography
- 17 Laminated Glass Protection
- 18 Raguin Assoc Inc: Statement on Protective Glazing
- 19 The Victorian Society Summer School Brochure
- 20 List of Contacts
- 21 List of Site Visits: Cathedrals Churches Museums Galleries

The Appendixed items are not included in this document  
but can be forwarded on request.

## List of Illustrations

Cover page: Quarry from Horton Kirby, Kent Plate 23 in Charles Winston's *Hints on Glass Painting* 1847.

- 1 Stained Glass Associates, Raleigh: Bob Wysocki and Bronwyn Hughes
- 2 Mary Clerkin Higgins Studio Brooklyn: Walter Coalbrigham Panel
- 3 Pieces of the Walter Coalbrigham Panel: a conservation nightmare
- 4 Marie Pascale Foucault cleaning a 15th century panel
- 5 Mary Clerkin Higgins with 15th century restoration
- 6 Mary Clerkin Higgins and Bronwyn Hughes in the Cloisters Museum, examining condensation on windows and stone work
- 7 Conservation Department of the Cloisters Museum. Note curing vertical glass
- 8 Peter Gibson in the main studio, York Glaziers' Trust
- 9 Le Centre International du Vitrail, Chartres
- 10 14th century Window from Chartres 'before' and 'after' restoration by Lorin Studio 1990
- 11 16th century Heraldic glass from the Chapel at Trinity Hospital, Greenwich, 'before' and 'after' restoration by Chapel Studio



## INTRODUCTION

**Conservation of Stained Glass** is an important, virtually non-existent sector of the stained glass industry in Australia. There are few stained glass conservators and, with the exception of one or two highly talented artist/craftsmen who have built on their substantial abilities as contemporary stained glass artists to extend their skills into restoration, few craftspeople confident of their ability to undertake restoration.

Australia's stained glass is generally less than 150 years old, very young by comparison with European architectural glass which dates from the 11th century. Very little research and documentation has been carried out on Australian glass<sup>1</sup> either to ascertain its importance in historical, cultural and social terms, or to determine its current condition. As the windows reach an age where deterioration is evident, it is important to commence the process of systematic inspection and documentation before loss and irreparable damage occurs. In order to achieve 'best practice' conservation, there is also a need to establish a workable code of practice and a register of qualified practitioners.

During the past five years, we have seen the restoration of some of Australia's important public buildings, such as the Queen Victoria Building in Sydney and the Sydney Town Hall. In Melbourne, it was the proposed restoration of St Patrick's Cathedral which directed my general interest in stained glass towards conservation issues. The majority of St Patrick's historiated glass is the work of John Hardman of Birmingham, but there are also locally made windows and a few imported from Germany. Through the generous support of the Goethe Institute, it was decided to send the Franz Mayer & Co windows back to the original maker in Germany for restoration. The possibility of Franz Mayer sending craftspeople here, was simply not considered and it seems that an opportunity for Australians to extend their skills by becoming involved in the conservation of one of our most important buildings had been lost.<sup>2</sup>

In my subsequent discussions with industry representatives, it became clear that they also had concerns regarding current restoration practice and that they perceived the need for a code of practice. Concern was expressed that:

- (1) the method of specification for restoration work was incorrect, did not vary from job to job (when prepared by the same consultant) and was tied to an inflexible set of 'rules'[the Burra Charter];
- (2) inadequate specifications leading to substantial unplanned modifications during restoration and consequent argument and stress;
- (3) the range of quotes showed either a lack of understanding of the specifications, or the specifications were not sufficiently clear to produce comparable quotations;
- (4) the lack of a code of practice meant that approaches to any given commission could start from different parameters;
- (5) a critical need exists for a register of accredited conservators and restorers;
- (6) there is confusion among insurance companies, architects, artists and stained glass firms because of the lack of basic ground rules.

---

<sup>1</sup> Two theses: Down, G 'Nineteenth Century Stained Glass in Melbourne', MA Thesis, University of Melbourne, 1975; Giedraityte, D 'Stained and Painted Glass in the Sydney Area c.1830-1920', MA Thesis, University of Sydney, 1983; and two books: Zimmer, J *Stained Glass in Australia*, Oxford University Press, 1984; Sherry, B *Australia's Historic Stained Glass*, Murray Child, 1991.

<sup>2</sup> The current restoration of stained glass at St Patrick's Cathedral is being undertaken by Wallace and Jewell, an Australian partnership.

Since that time, I have been investigating the feasibility of establishing a centre for the conservation and restoration of glass which would embody the following areas:

- \* Restoration Practice: Restoration of stained glass to the high standard of principles laid down in the ICOMOS Burra Charter.

- \* Research: The need for a theoretical underpinning of work undertaken in the workshop. Research would be pursued in a number of areas - scientific investigation into composition of glasses, leads, paints and stains, art historical investigation and possibly wider social, architectural and cultural study.

- \* Documentation: Associated with both restoration practice and research, documentation of the past history and present work on windows is essential to more effectively make better conservation decisions in the future.

- \* Education: Education should take many different forms, both formal and informal. The first aim is the training of artists and craftspeople in the intricacies of stained glass restoration work. Almost as important is the education of owners and custodians of historic buildings, including the clergy, architects and builders. The viability of the workshop will depend upon support from these individuals and organisations, therefore it is important they become familiar with and supportive of the activities of the workshop. The extension of this pool of knowledge into the wider community would also have advantages in greater financial support for public restoration funds and tourism.

## **Support and Sponsorship**

The opportunity to study current conservation of stained glass was the result initially of an application to the Outside Studies Program of the Faculty of Professional Studies, Monash University. The Outside Studies Program is an initiative of the university and the modern successor to sabbatical leave. Its purpose is to encourage academic staff to extend their research, skills and networks within and outside Australia in designed programs which will have longer term advantages for the individual, the Department and the University.

The award of an International Specialised Skills Training Fellowship greatly enhanced the original program and was instrumental in the decision to widen the scope of the tour.

Both organisations have been highly supportive of the initial idea of the centre and the means to achieve it, including the overseas tour.

I believe that the tour achieved the aims of

- (1) identifying leading practitioners and creating a network of information;
- (2) assessing the suitability of world conservation practice for Australian conditions, and;
- (3) opening new opportunities for others to explore avenues which will benefit glass conservation in Australia.

I also received invaluable support from my husband, David Hughes, who acted as secretary, travel agent, money changer and minder which allowed me full concentration on preparation for appointments, discussions and report writing prior to departure and as we travelled.

Mention should also be made of the kindness and generosity of the people we visited. Apart from freely giving information and enthusiastically embracing the concept of an Australian centre for glass, they also provided accommodation and meals, in many cases without having any more knowledge of me than a letter from the other side of world. This kind of support was neither asked for, nor expected, and has resulted in new friendships and anticipated reciprocal visits.

The study tour was extremely positive, both personally and, I believe, for Monash University and International Specialised Skills and the future of stained glass conservation in Australia.

## **The Study Program**

The purpose of the study program was to meet academics, researchers, stained glass artists and practitioners engaged in a range of aspects of stained glass conservation. I deliberately chose to visit both small, privately owned studios and large institutional conservation departments to ascertain differences in approach. I felt that it was also important to compare and assess work undertaken for museum conditions and for works extant in architecture.

Given the time constraints, I confined my study tour to the east coast of USA, England and Paris and Chartres in France. The full itinerary is included as Appendix 1. These destinations were selected primarily for the following reasons.

### **United States of America**

America has a huge corpus of stained glass, roughly the same age as the majority of Australian glass and I was keen to see its condition and to evaluate the range of programs for its conservation. While locally made American glass is often quite different from its Australian counterpart, equivalents can be found in imported British and European glass. Because so many areas of the USA offer a selection of excellent collections and architectural glass the decision to travel in the east was ultimately based around the opportunity to spend time in two of the world's most important and comprehensive collections, namely, the Corning Glass Museum and The Cloisters.

### **United Kingdom**

As so much of Australia's glass was imported from Britain during the nineteenth century, it was important to establish links with artists, firms and organisations involved in conservation of British glass. Conservation programs have tended to concentrate on medieval glass and, despite their very real understanding of history, the need to conserve the recent (nineteenth century) past has only just become an issue amongst academics and conservators.

### **France**

Although very little French glass can be found in Australia, conservation of nineteenth century stained glass has been receiving considerable attention in recent years. Research carried out at the Laboratory for Landmark Buildings on adhesives, protective glazing and ventilation has been at the forefront of world developments. Chartres Cathedral, about an hour from Paris, is also the place of pilgrimage for every glass artist and historian. It remains one of the most significant installations of stained glass in the world.

As I travelled, I made extensive notes which have proved invaluable in compiling this document. Although more detailed than this report, the extensive information is difficult to access in its diary format, however it is available for perusal if so required.

I have also compiled a collection of more than 900 slides, a resource which will provide both back-up to this report, to the training activities which will flow from the study tour through International Specialised Skills and my teaching and research commitments at Monash University.

## Definitions

Some problems arose, particularly in England, between the terms, 'conservation' and 'restoration'. Definitions, as defined by the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance, (the Burra Charter), are as follows:

*'Conservation means all processes of looking after a place so as to retain its cultural significance. It includes maintenance and may according to circumstance include preservation, restoration, reconstruction and adaption and will be commonly a combination of more than one of these.*

*Restoration means returning the EXISTING fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.'*<sup>3</sup>

Conservation is therefore an all-embracing term and its practice may include a complexity of tasks, including restoration, to protect and preserve the window. Restoration is one part of this process and usually involves specialist practical skills.

Stained glass conservation, as defined by the *Burra Charter*, should rightly only be termed 'conserved' when it remains in its original, architectural setting. And yet, because of the activity of museums, it is stained glass within museums which is seen as being 'conserved'. Confusion is inevitable, so throughout the document I have attempted to use the wider 'conservation' term where a multitude of tasks have been undertaken within a framework of preservation of cultural significance.

I have used the term 'restoration' in its Burra Charter context, however some practitioners see 'restoration' as that activity taking place in the architectural setting, (as will be seen in the report). And, occasionally, some work labelled as 'restoration' would be better termed 'repair' or 'reconstruction'.

---

<sup>3</sup> As well as the *Burra Charter*, the *Illustrated Burra Charter* expands the explanations to give further clarification of terms. The *Burra Charter* was developed from the ICOMOS *Venice Charter*, but remains essentially the same.

## CONSERVATION CENTRES

### Small Private Studios

#### Principals - Studio Environment - Clients - Processes

The small studio is an important sector of the conservation of stained glass network and it is where a large proportion of stained glass restoration is undertaken by individual artists, or teams of stained glass artisans. The output of these studios ranges from the conservation of exceptional historic windows to simple domestic leadlight repairs. Despite my plans to ask similar questions of each studio principal, answers often strayed into new areas of discussion and interest.

The summaries below include details on the principals and staff, the studio environment and their clients. Occasionally I have included details on processes where they are peculiar to the particular studio. Generally however, as they are often the most contentious issues associated with conservation, processes are discussed in detail in the following sections of the report.

#### Stained Glass Associates

The first of my appointments was with Robert J Wysocki, principal of Stained Glass Associates in Raleigh, North Carolina.

Stained Glass Associates was started by Bob Wysocki in 1958 after he had worked for several years for two other stained glass studios - Russell Bingham of Winston-Salem NC, then as representative of a Statesville firm.

The time spent learning the business and marketing of stained glass was put to good use at Stained Glass Associates, where twelve people are now employed and installations can be seen in 26 States and Sweden. The decision to include 'Associates' as part of the company name was determined by Bob Wysocki's intention to undertake all facets of church furnishing, including tapestries, statuary, lighting, and there would be a need for other craftspeople with expertise in these specialist areas.

Stained Glass Associates operates out of a two-storey studio in Knightsbridge, a small village twelve miles from Raleigh. The lower floor of the building is divided into areas for reception, cartoon-making, cutting, leading, storage and firing of glass, in much the same way as an Australian studio. Upstairs is a small conference room, offices for the secretary and Bob Wysocki, a large storage area and a small area for cutting dalle de verre glass. Skilled staff are employed for glass painting, design and manufacture of panels, but Wysocki retains overall supervision and artistic control.

Stained Glass Associates has installed 954 windows since 1958 and is conscious of nearing the grand total of 1000. (Hamer Studios in New Jersey took three generations before achieving this number.) Amongst these are several installations within the Raleigh area including the Church of the Good Shepherd, Bethlehem Community Baptist Church, Brown Wynne Funeral Parlour, St Mary's Street Durham

The business has been built on a team approach: a wish to accommodate the requirements of the client within an aesthetic and practical framework, and between the various members of the SGA staff. Restoration work has been a large part of his business and it can be seen from the following examples that Bob Wysocki takes a minimal-interventionist approach to restoration. He has been involved in many stained glass restorations and repairs within the Raleigh district, including the Episcopal Church of the Good Shepherd, the Cathedral of the Sacred Heart, First Baptist Church and First Presbyterian Church.



The Church of the Good Shepherd has a full complement of windows by a number of different studios but the early vestry laid down a cycle of biblical subjects which identified their placement in the window openings. This foresight has resulted in a coherent liturgical progression and given an overall unity to the church. There are clear differences in style of the different studios, particularly noticeable in the painting of flesh, but the uniting force is high colour palette and strong treatment. Over time Bob Wysocki has replaced some of the leading in the lower sections of bulging windows and double glazed one window.

The First Presbyterian Church has Raleigh's only Louis Comfort Tiffany window. It is installed in the west wall, flanked by two probably earlier windows of similar style. Made in a simple style from vertically set rectangles of opalescent blue glass, it is the patterned border of red and green leaf design, intricately leaded, that makes it very special. Bob Wysocki has only carried out minimal repair work, as necessary, on this set of windows.

A particularly satisfying consultancy was undertaken jointly with Mellote-Morse Stained Glass Inc., a Chicago firm who are conservation architects as well as specialists in stained glass conservation. Wysocki was part of a consultant team looking at Frank Lloyd Wright's Dana Thomas House which had been purchased for \$US 0.75 million. The owners wanted to know if they had paid too much. The survey identified and recorded 220 windows, numerous light fittings and other pieces which they valued at more than \$US 2 million alone! He worked with the same firm to restore the Capitol Building, Illinois.

Accepted as a member of the Stained Glass Association of America in 1972, he has been an active member and contributor to their journal, *Stained Glass*. Until recently he was Chairman of the Accreditation and Restoration Committee of the SGAA, a position now filled by Art Femenella.

### **Daniel Maher Stained Glass**

The opportunity to meet Daniel Maher in Cambridge Massachusetts was unexpected, and although of short duration, added significantly to my understanding of American glass and its conservation. Maher operates a small studio with only two colleagues, both of whom are excellent artists and glass painters. He has had extensive training in the Connick Studios and the Lynn Hovey Studio, both well known American stained glass firms. Like Wysocki, most of his restoration work has been in architectural situations, some of which have presented unusual challenges such as John La Farge's three lancet windows in the west end of Trinity Church, Boston. Maher's approach is to treat each restoration commission as an individual problem-solving exercise and his high quality results show the success of this method. He has recently been involved in the restoration of Harvard Memorial Hall as well as Trinity Church, - two important local projects, both of which are of national significance.

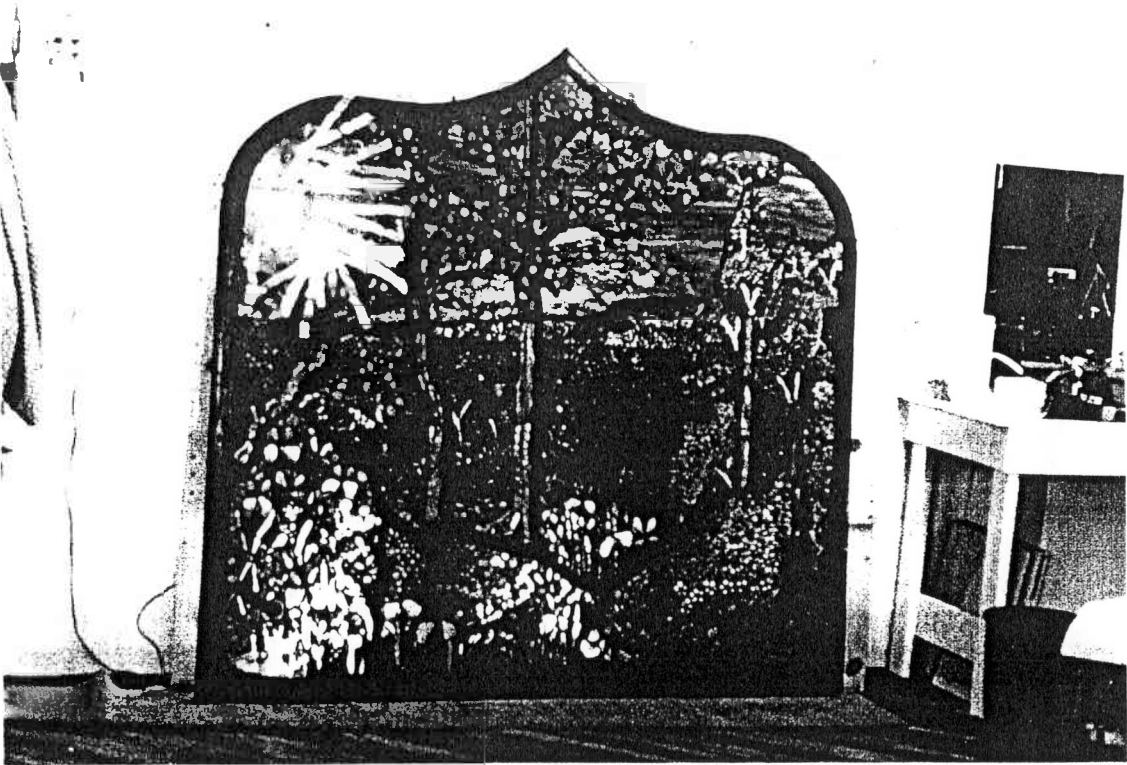
The Maher Studio is small, one large shop-front, which presented problems occasionally when large works were in progress, but seldom limited the scope of the restoration.

Daniel keeps good photographic records of all his commissions, showing 'before' and 'after' shots of the work as well as comprehensive shots of 'work in progress'.

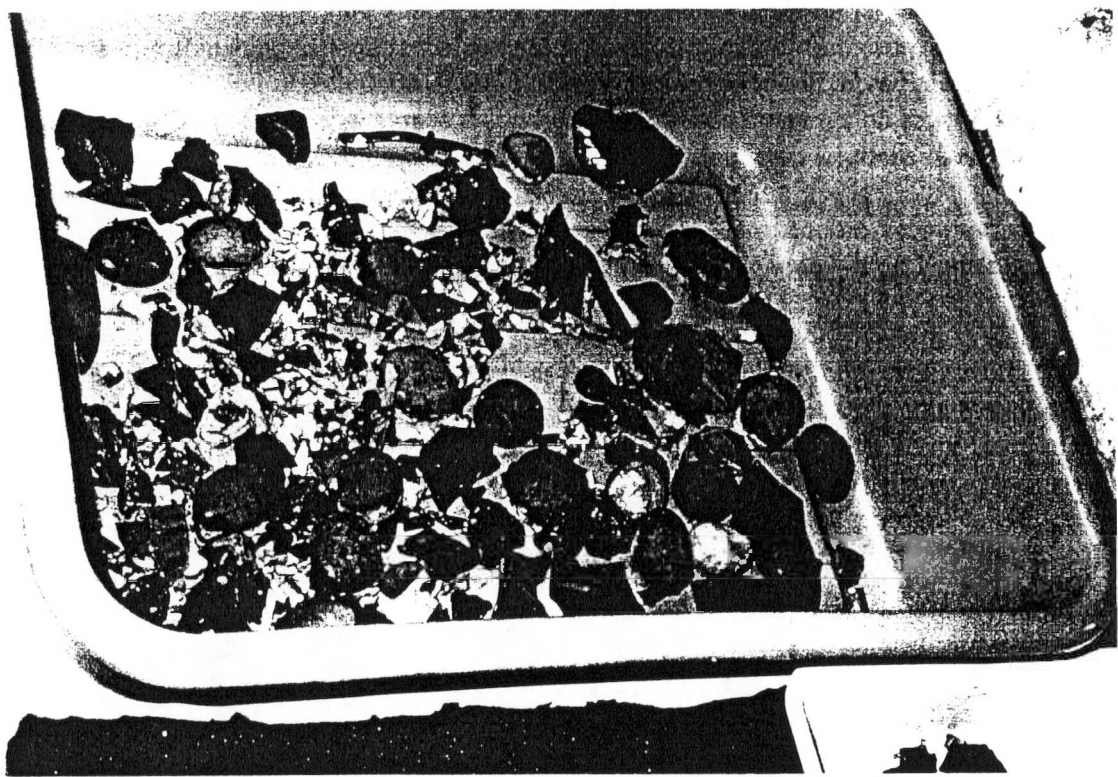
### **Mary Clerkin Higgins**

In New York I made contact with Mary Clerkin Higgins, a freelance conservator with a studio in Brooklyn and who also works for the Metropolitan Museum of New York and their Cloisters annexe.





2 Mary Clerkin Higgins Studio Brooklyn: Walter Coalbrigham Panel



3 Pieces of the Walter Coalbrigham Panel: a conservation nightmare

Clerkin Higgins trained in the studio of Mel Greenland, the director of Greenland Studios and conservator of St Ann and the Holy Trinity, Brooklyn. Clerkin Higgins started by sweeping floors and then worked in all facets of stained glass production and conservation. Before starting her own business she was head of restoration at Greenland. Her previous work has included making 17 feet high windows for the National Cathedral, Washington, under the direction of the designer, Rohan Le Compte. She has recently completed the restoration of the Harry Clarke Geneva Window for the Wolfsonian Foundation, Florida. The history and conservation process is well documented by Clerkin Higgins in *Stained Glass* Volume 88 Number 1, Spring Issue, 1993 which is included in Appendix 2.

Her Brooklyn studio is in a grotty warehouse which houses numbers of other artists squarrelled away in their own hidey holes. Despite the very run down look of the building and the area, it is a remarkably safe building, secured by huge steel doors, and one must phone from the lobby prior to gaining entry. The studio is a surprise: a large, high-ceilinged, well-lit room overlooking the East River and Manhattan. The ample space is well-organised with storage of glass and panels around the walls, and light tables set in the centre of the space close to cleaning apparatus and waste disposal.

On the day of my visit, Clerkin Higgins was working with Marie Pascale Foucault, another highly respected conservator, on 15th century panels from the Nelson Atkins Collection in the Kansas City Art Museum. Both panels under restoration will be installed under museum conditions. The processes being used for these panels are discussed in the technical sections of this report.

One of the most challenging restorations is currently waiting to be tackled in Clerkin Higgins's studio. It is a large Art Nouveau window in the possession of the Brooklyn Museum, and completely different in technique from other work of its time. An interesting and beautiful window, it is the work of Walter Coalbrigham, a later contemporary of Tiffany and La Farge, who developed an astonishing technique which he wrote about in one of the leading journals of the day as a 'breakthrough' and a 'technique of the future'. The technique involved placing glass pieces - mosaics, chunks, jewels, shells, stones and other non-vitreous elements on to a backing sheet and filling the gaps between with linseed oil putty. The completed sections were then set into mullions. The whole window became quite heavy and over the years the putty has dried out, allowing large areas to fall off the backing plate. It has also become very dirty, not only the exterior surfaces, but also between the back plate and the glass pieces where linseed oil, putty and dirt has seeped down.

The problems of restoration are entirely new, as this appears to be the only extant work of this type. It is therefore important to try to save it, if only as an example of what not to do! Because a section in the upper left corner, approximately 400 x 400mm, has already fallen off, there is an opportunity to experiment a little with glues and putty matrixes but one can see the dilemma for the restorer. Should all the pieces be removed, as they are in a precarious state at present? The original is unsatisfactory, but how to reinstate it without changing the materials? We await further developments, with interest.

### **Chapel Studio**

Chapel Studio, Huntonbridge, Kings Langley, Hertfordshire, on the outskirts of London was the largest of all the 'small' studios on my itinerary. It has built a reputation for high quality restoration and conservation work. Steven Clare, one of the partners, gave me a comprehensive tour of the premises and an excellent run down on the processes and activities of the studio. Chapel Studio designs and makes new windows for all types of buildings from homes to cathedrals and undertakes conservation, restoration and repair work.



4 Marie Pascale Foucault  
cleaning a 15th century panel



5 Mary Clerkin Higgins with 15th century restoration

Chapel Studio was founded in 1973 by Alfred Fisher, Fellow of the British Society of Master Glass-Painters, and Peter Archer. Alfred Fisher has also been one of the prime movers behind the attempt by the Master Glass-Painters to implement standards through studio accreditation. All the partners were trained at Whitefriars Studios, one of London's oldest and most respected studios which sadly closed its doors in 1980. Current staff are usually trained 'on the job', but come to Chapel Studio with a background in fine arts or stained glass.

The group of three partners and a staff of twelve work out of an attractive recycled chapel. The main floor is taken up with cartoon-making, painting, documentation and recording, and the office is on a mezzanine floor built over about one third of the floor space and under the sloping ceiling of the building. The cleaning and fabrication processes are carried out in part of a factory complex across the road. They also run a conservation service for historic stained glass of all periods including medieval, 16th century heraldic glass and Arts and Crafts Movement styles. This facility is located at Amersham.

Chapel Studio has a well-organised system of documentation for all windows which includes photography and rubbings of windows before removal. The rubbings are photo-reduced in scale and annotated to show where restoration is required - a useful source of data for both the conservator and the client. 'Before' and 'after' photographs are kept of all jobs and the entire process is documented throughout the treatment stage. Chapel Studio conservation practice is strongly committed to retention of original material and visual integrity.

### **Roy W Coomber, Stained Glass Artist**

The last small studio visited was that of Roy W Coomber of Bristol, whose articles over many years in *Stained Glass* have added significantly to my knowledge of restoration.

Coomber's smallest stained glass studio I visited. Situated in two very small spaces at the rear of a row of shops, the main studio is a room no more than 4 x 3 metres. The light table dominated this area with a vertical easel, cupboards and storage taking up the walls. A sloping ceiling had a skylight running most of its length above the table and a long blind could be pulled across it to exclude daylight if necessary.

Coomber started his apprenticeship during World War II (1944) and served seven years, training principally as a designer of stained glass. His early duties were to sweep floors and simply observe the craftsmen. His first task was to stretch leads, - a process which taught him about its work-hardening properties - and he quickly learned to distinguish between sizes and profiles. He graduated to cutting squares and diamonds in glass but it was two years before he was allowed to cut curves!

He worked for several of the larger firms including Whipple's and Goddard & Gibbs before becoming manager of Solaglass in Bristol. The work became more managerial as time went on and eight years ago he made the decision to return to designing, the aspect of stained glass work which most interests him.

Most of his output is new work and restorations for others' commissions. While I was at the studio, he was completing a large commission for a new Lutheran Church in New York. Unlike most other studios who retain complete control over their work at all stages, Coomber will complete the work and send the finished pieces for leading and installation by others. With this commission he has been to see the site and discuss it with the client, but this is not always the case.

Many of his restoration jobs are completed without him seeing the window in its entirety. One studio for which he does many restorations sends the broken pieces taped to cardboard sheets with a colour print of the section of window which is broken. He then colour matches the glass and repaints the section, taking as many firings as required to achieve a good match.

Other firms send glass already selected and cut. (His assistant, Laura, was working on a nineteenth century section which had been sent in this way. The new glass was cut so badly that it would be difficult for new leading to be done without re-cutting the fired pieces.)

The 'old' glass is either returned to the firm or, if this is not a requirement of the brief, it is stored by Coomber. The re-painted and fired pieces are once again stuck to cardboard and boxed with polystyrene packing and shipped back for re-leading.

While the workmanship was of a high standard, there was little evidence of a philosophical basis for any work and he made it clear that he worked on 'restoration' not 'conservation'. For Roy Coomber, 'conservation' meant edge-gluing and plating pieces before re-leading as 'museums and York Glaziers' Trust might do it'. He sees 'restoration' as re-firing and remaking damaged pieces to the previous standard of the window.

He is always assured of work, partly because nineteenth century windows are not seen as requiring 'conservation' techniques in the same way as is deemed necessary for medieval windows. Glass of the Victorian era does not enjoy the same reverential adulation, and their content and historical significance is not well understood or appreciated generally.

## Museum Conservation Departments

Stained glass is principally an architectural art and, as such, is not seen in museums to the same extent as the moveable fine or decorative art object. Conservation of stained glass is therefore not a universal part of museum conservation programs, although my experience suggests that it is a growing field, and almost every department I visited was planning extensions or new premises. The emphasis was firmly on the quality of the conservation work in all establishments - a far more important consideration than the amount of time needed to achieve that result. In fact, the time taken to complete a restoration may not be very long at all, but ample time may be given to find the most satisfactory result by experimentation or investigation prior to commencement of the work.

### Corning Museum of Glass

My visit to the Corning Museum of Glass at the Corning Glass Centre, Corning, New York was primarily to access the Rakow Library collection of 64 000 items, including books, periodicals, films, videos, press cutting files and catalogues.

I spent the equivalent of three full days in the Rakow Library researching information on conservation and related topics, greatly assisted by Ms Norma Jenkins, the Head Librarian and Virginia Wright, the Reference Librarian. I photocopied more than 400 pages of articles and references on conservation, restoration, adhesives and other documentation - too large to include in an appendix here, but available for other researchers and conservators. This wealth of documentation, unobtainable through sources in Australia, will assist the development of a Centre for Glass in Melbourne.

Another aspect of the research was identifying connections with Australian glass, mainly through English glass, but also through contemporary American glass and criticism.

Other research identified a number of books for purchase by the Monash Library, some essential for the undergraduate program, others more important for post graduate work and the Glass Centre. A full list of these and other references in Appendix.

This research also gave me an opportunity to examine documentation on the glass of America's top studios. Some of these I was familiar with, in a superficial way, others were revelations in their brilliance and depth. The nineteenth (and twentieth) century resurgence of stained glass in USA is contemporaneous with the growth of stained glass in Australia, and, although it developed quite differently, there are parallels which can be of value in documenting Australian glass and also in its conservation.

Susanne K Frantz, Curator of Twentieth Century Glass at Corning Museum of Glass, introduced me to Dr Stephen Koob, newly appointed Conservator for the Corning Museum. He inherited a department which was previously run by an untrained enthusiast and which did not enjoy a high profile within the Museum, but his appointment is an indication of the changing priorities towards to conservation of their collections.

At the time of my visit he had only been on the staff for a month and as he was trying to sort out the laboratory he did not even have an office or desk. He sees many areas of need but high priorities include - improvement of the temperature in the laboratory which is currently too low; sorting out of outdated and buying new equipment; cleaning out old and outdated chemicals, many of which (although superior in some cases to current products) are no longer available; re-organising the conservation catalogue to interface with the accession registrations; and computerising the catalogue so that simple cross referencing can be achieved.

He needs to implement these system changes and, at the same time, continue the 'real' work of conservation. He had already been asked to look at a piece which was to be lent to another organisation only to find that it has been broken since 1985. Worse, the pieces had not been stored with the main piece and appeared to be lost. This is an example of the practices which he will be required to rectify. An urgent requirement is to review the policies of the museum in the areas of conservation, registration and curation so that these problems do not re-occur.

Dr Koob sees Corning Museum as offering a good balance of exhibitions, publications, access to the public. Many museums are totally exhibition-led which allows little time for research and therefore publication. Importantly, he hopes to continue his research into adhesives which will have positive flow-on opportunities for today's artists to improve their use of adhesives.

His appointment clearly is a recognition of the growing importance of conservation by the Corning Museum of Glass and although he is far more involved in conservation of glass objects, his forthcoming publications will also have significant ramifications for stained glass restoration.

I had also hoped to meet with Dr Robert H Brill, Research Scientist at Corning who has been investigating ancient glass compositions for many years, however he was on leave and I have since begun correspondence with him on relevant information on nineteenth century glasses.

### **The Cloisters annexe of the Metropolitan Museum of Art**

The Cloisters, at Fort Tryon Park on north Manhattan Island, is devoted to the art of the Middle Ages, housed in portions of five medieval cloisters which have been integrated into a twentieth century structure to create an evocative architectural edifice in which glass, metalwork, sculpture, tapestries, manuscripts and panel paintings are exhibited. The Cloisters was opened to the public in 1938, its collections have continued to grow in diversity and scope. Mary Clerkin Higgins is currently working on the roundel collection and she guided me through the Museum on a day when it is closed to the public - a rare opportunity for detailed examination and discussion of the collection.

The work here is slightly different to the usual museum setting because most the pieces are incorporated into the architecture. Some of the windows have been placed in spaces designed for them, but later acquisitions have had to be adapted to existing spaces with the addition of borders, bases, etc. In most cases alterations to the original fabric of the window are documented on plaques adjoining the exhibit, although, on examination, Clerkin Higgins pronounced some as incorrect.

The roundels which she is currently conserving are mainly European from the 15th century, using the same restoration processes as the 15th century panels in the studio. They are to be exhibited again in 1995, although some will go into storage and later acquisitions will take their place. The roundels are exhibited in double-glazed diamond lancet windows on an external wall, in a corridor area of the Cloisters. The building suffers from the same problems as many European church buildings, - notably damaging condensation on the windows being of major concern, despite double glazing for vandal protection.

In previous centuries, buildings were not heated, therefore the inside and outside temperatures remained, if not the same, within only a few degrees difference. The introduction of heating causes moisture in the warm internal atmosphere to condense and run down the inside of the cold glass, eventually lifting poorly fired paint and creating problems with the stone work. Michelle, the supervising conservator, had photographs of towels being laid in the bases of niches to absorb the





6 Mary Clerkin Higgins and Bronwyn Hughes in the Cloisters Museum, examining condensation on windows and stone work





7 Conservation Department of the Cloisters Museum. Note curing vertical glass

heavy flow of condensation because of the unusually intense cold temperatures, - minus Fahrenheit degrees.

While the roundels are removed from their niches, the Museum is experimenting with different protective glazing techniques. Although all the current double glazed windows have ventilation, this does not stop condensation. One experiment has introduced triple glazing which seems to be effective in reducing the condensation. More like isothermal glazing, it has substantially more ventilation space top and bottom. The present test is rather crude but, with better finish, it could provide an answer to the problem. I recorded these experimental installations on slides.

The Conservation Department of The Cloisters is housed in a small room with four people working on different projects - stained glass, wood sculpture, documentation and photography were all underway on the day of my visit. (Marie Foucault has a small room in another part of the building where she is slowly resurrecting a badly damaged fifteenth century panel approximately 2 feet square). Each conservator has little more space than about 2 metres square. Like the Corning Museum of Glass, the Cloisters management has recognised the need for greater focus on conservation and the department will soon move to larger on-site premises. Despite the lack of space there is an atmosphere of scholarship and dedication to the task.

### **Victoria and Albert Museum**

My contact at the Victoria and Albert Museum South Kensington London was the Curator of Ceramics and Glass, Jennifer Opie. Jennifer has been with the V&A for more than twelve years and has a good overview of the many departments in this British institution. At the time of my visit, she was supervising the last of the new permanent exhibition and re-interpretation of the glass collection in a totally refurbished space. Objects are arranged in chronological order, from the Roman period onwards. Of the remarkable collection of 8 000 glass items there will still be approximately one thousand items retained in storage.

Collection holdings which are not on display are stored on the other side of London in a converted post office mail sorting warehouse. The museum has a policy of making the collection accessible to the public and in particular to scholars who may wish to study its holdings. It is necessary to book ahead to arrange access to this facility.

As part of the glass exhibit, Corning Museum of Glass and the V & A are jointly developing a multi-media program on the history of glass. It will be possible to see an item in the case, read the basic small label with its name, type, date etc and then, by using its number, access the computer data base for further, more detailed information and cross referenced sources. It is a tremendous advance since 1989, when I last visited the museum.

Problems which were apparent five years ago included glass 'sickness' due to humidity and lack of lighting. Fire protection and early warning systems have now been installed for the first time; new purpose-built cases have been designed to light the glass properly and to provide a stable atmosphere; cases are fitted with humidity monitoring devices and silica gel trays. The emphasis in the museum has shifted from interactive conservation to preventative conservation in all areas.

There is no complete catalogue of the collection and items are listed on card index or in handwritten notes. Michael Archer, Keeper of Decorative Arts, and highly experienced in the practical applications of conservation theory. He is currently engaged on a catalogue of the Delft ware in the V & A collection and it is hoped that his next major task will be the catalogue of glass holdings.

His extensive interests and connections with heritage organisations and the Church of England, as well as stained glass conservation bodies, made our wide-ranging discussion extremely informative and pleasurable.

Archer is a member of the Council for the Care of Churches, the peak body within the Church of England for conservation of church property and our discussion moved to its role in the restoration of church windows. He is also Chairman of the Stained Glass Sub-Committee.

The following is a summary of the system a church wishing to make 'significant changes' to a window, including restoration or replacement, should proceed. Firstly, any Parish Church of England, through its' vestry, must apply to the Diocese Advisory Committee for a Faculty<sup>4</sup>. Each DAC has an expert group of members including architects (2 or 3), specialists in garden/surroundings, stained glass, fittings and others, and an Archdeacon who is an ex officio member. The Chairman can be drawn from either the clergy or laity. The findings of this committee are referred to the Chancellor of the Diocese, usually a lawyer, who issues the faculty. If the faculty is granted, and sometimes this occurs on fairly flimsy grounds, the responsibility for its fulfilment is the responsibility of the particular church - unless they apply for grant money. Granting bodies may impose terms and conditions for the awarding of funds.

One of the primary sources of funding and expertise is the Council for the Care of Churches. It has an impressive staff and wealth of information which is available freely and for free. The CCC has the ability to impose strict guidelines tied to grant monies which should ensure good restoration practices. The difficulty lies in those cases where faculties are not sought, or churches funding their own installations have no check on their practices.

The Victoria and Albert Museum has an extensive library which includes archives which would be of value to scholars and researchers of Australian glass. For instance, a copy of the Sir Thomas Kendrick<sup>5</sup> index is held by the main library and Tower and Kempe<sup>6</sup> archives are available for study. As in the case of the stored collection, it is advisable to make prior arrangement to access this facility.

The Conservation Department of the V & A is a large section of the Museum. It was re-organised about twelve months ago to more adequately reflect the growing and changing nature of conservation. An organisational diagram is included as Appendix 4

The largest sections are paper and textile conservation, while stained glass has the smallest number of staff. It is housed in a long studio with good light from a single direction and adequate room for three people to work and move through the space.

Agnes Holden, the Head of Stained Glass Conservation, was on maternity leave and I was warmly welcomed by Samantha Whitney, the permanent conservator, and Drew Anderson.

---

<sup>4</sup> Faculties are issued by the Archbishop of the Diocese and should conform to liturgical practice and maintain aesthetic integrity.

<sup>5</sup> Sir Thomas Kendrick in the 1950's attempted to list windows through examination of contemporary architectural journals. The list was neither completed to Kendrick's satisfaction nor published.

<sup>6</sup> C E Kempe (1837-1907) and later his cousin, Walter Tower operated one of the most successful nineteenth century English church furnishing companies (1866-1934).

Whitney trained at Chelsea Art School in mural design, stained glass and mosaic, and Anderson recently completed the RCA/V&A Conservation course. Both were extremely helpful and gave me a good insight into the work and workings of the Museum and were able to discuss their respective educational options in detail adding considerably to the information presented in the course brochures. See the Appendix 5 for further information.

Whitney was employed as a trainee for three years before becoming a permanent conservator. She estimated the holdings in stained glass to be anywhere up to 2500 items, but as they are not yet catalogued it is impossible to be exact. There is great scope for scholarly study with an outstanding bank of material held at the V & A. It represents a total cross section of stained glass and includes Swiss 16th century, German Cologne 17th century, Victorian and contemporary glass amongst its finest panels.

Ten years ago, there was little documentation completed on conservation work which makes current work more difficult. All restoration work is now being fully recorded. Conservation techniques are discussed separately.

### **Cathedral Studios**

The studios attached to Britain's cathedrals are highly focussed enterprises with particular skills in conservation and restoration. Central to their successful operation is the understanding of the history of the institution, coupled with a clear understanding and depth of knowledge on iconography, church architecture and (usually medieval) stained glass. Despite the large output of these studios, I was surprised by the small staff numbers and space which they occupied. They could not afford the luxury of long contemplation of panels, awaiting the 'correct' decision before tackling restoration. Here the task was approached confidently, often with years of knowledge and experience.

Discussions with Dr Sebastian Strobl at Canterbury and Peter Gibson at York confirmed my earlier conversation with Michael Archer at the V&A, that the structure and funding of church establishments takes a different form to the private studio or museum department.

### **Dean and Chapter of Canterbury Cathedral Studios**

Dr Sebastian Strobl, Director of the Canterbury Cathedral Stained Glass Studio was most welcoming and kindly offered to see me for a full morning, between finishing a report for the Dean and Chapter and flying to Germany as assessor for masters students.

Strobl is one of the few studio/workshop leaders who has a background in the practice as well as the theory of stained glass. He was a trainee in the excellent apprenticeship system in Reinbach, Germany which demanded a five year journeyman's certificate followed by another year to qualify as Master Glazier. He would be called an 'art glazier' in Germany, and the Australian equivalent would be somewhere between a glass painter and glazier. His final examination panel (Heraldry of the London Glaziers' Guild), hanging in the window of his office, showed the emphasis on precise workmanship expected by the German apprenticeship system.

The subject of his doctoral thesis from Cologne University was Medieval Glass and Techniques in which he proposed a controversial theory on the cementing of medieval leads<sup>7</sup>.

<sup>7</sup> Strobl, S *Glastechnik des Mittelalters*, Gentner Verlag, Stuttgart, 1990.

After graduating, he ran his own studio in Cologne, thus he brings a broad understanding of a number of facets of stained glass conservation into the Canterbury Cathedral studio. He is critical of the present system in Europe which allows anyone to hang up a shingle and call themselves a 'conservator', a situation which also exists in Australia.

As Director, Strobl is answerable to an Archdeacon, through a Canon, who acts as Treasurer and is responsible for the day-to-day problems of the studio. He reports to meetings of the Dean and Chapter.

The Canterbury Cathedral studio/workshop is situated in the grounds of the Cathedral, almost opposite the West Door, and is part of the Works Maintenance department. The studio is a two-storied building with the firing, leading, cementing activities and Treasury on the lower level. The upper storey has the Director's and other offices and the conservation/restoration studio including microscopic examination, cleaning and painting activities. This has its problems, as all panels are required to be replaced in the Treasury at night, and a set of very steep stairs needs to be negotiated every morning and evening in order to work on the panels during the day. So far, there have been no accidents.

The studio is staffed by about twelve people, including a foreman, three full-time and two part-time conservators. Two of the current staff trained in Germany and there is a trainee from Finland. At the time of my visit, Strobl was intending to employ a recent graduate from Swansea stained glass course. There are no official apprenticeships in Britain and therefore no formalised training for artworkers in restoration techniques.

Different leadlight techniques are used in Germany and Britain, which occasionally caused some conflict in restoration projects. In Germany, leads are often underleaved at the vulnerable solder joint, whereas British trained artworkers but-joint the lead. Research does not support the underlying contention that under-leaving strengthens the solder joint. Glass cutting is by template in Germany, (to achieve greater accuracy), and by cartoon under the glass in Britain (to cut quickly). Skilful craftspeople in both countries are capable of both accuracy and speed.

The systems for reporting and treatment were similar to those in effect at Chapel Studio and at York Glaziers' Trust.

While the Canterbury Studio was primarily set up for maintaining the windows of the Cathedral, approximately 20% of their work is generated from other churches and cathedrals. Apart from the need to generate income, it gives the staff an opportunity to see stained glass other than medieval and also makes them confront new problems. At the time of my visit the conservators were working on a Heaton, Butler and Bayne window of the late nineteenth century, which had some paint loss and other problems.

Strobl is consultant to a number of Diocese Advisory Committees but does not see his role as generating work for the Canterbury Studio. In some instances he specifically recommended against early intervention. He believes it is important to build mutual trust and to educate DAC members on the intricacies of glass conservation.

### **The York Glaziers' Trust**

The studio which I was most keen to see during my trip was the York Glaziers' Trust at York Minster, and I had tentatively arranged to meet Mr Peter Gibson, its legendary Secretary.



8 Peter Gibson in the main studio, York Glaziers' Trust

It was difficult to get to see Gibson because of his extremely busy schedule which regularly follows the pattern of the days surrounding my visit - Wednesday he had been at Bradford cleaning and checking some panels in the Cathedral; Thursday he was preparing a lecture for the following day but agreed to see me at 5.00 pm for about an hour and a half; Friday he was to leave for the Scottish border to deliver the lecture and would arrive back in York at 1.00am Saturday for two intensive days of workshops and demonstrations associated with the Viking Festival.

During the day I had the opportunity to revisit York Minster and examine the glass with more knowledge and greater understanding than five years previously. York Minister has glass from the 12th to the 20th centuries, but the nineteenth century glass was of particular interest as some is the work of C E Kempe. I have been able to see his work in USA and England as well as some of his 72 windows which are installed in Australia.

The York Glaziers Trust was formed on 1 September 1967. It evolved from the former stained glass workshop of York Minster with money supplied through the Pilgrim Trust.<sup>8</sup> The Pilgrim Trust gave a great deal of financial support to the post-war restoration of stained glass windows. At York, first priority after World War 2 was the survey and restoration of the clerestory windows which had not been removed during the war.

The York Glaziers Trust was set up to conserve the medieval windows of cathedrals and parishes throughout England, not just the windows of York Minster as is commonly thought. It started with a staff of two, - the foreman and Gibson working at the bench. The Trust now has a surprisingly small staff of eight, including its first female 'apprentice'<sup>9</sup>.

Gibson started at the stained glass workshop at the age of 15, straight from the Nunthorpe Modern Secondary School. He had been an altar server in the Cathedral and the Dean, the remarkable Eric, gave him his first job in the workshop. Gibson freely admits that he had very little interest in or understanding of stained glass but the Dean lent him several books on the subject. He left school on the Friday and started at the workshop at 8am on the following Monday. He served a seven year apprenticeship as a glazier and during that time worked on all aspects of stained glass restoration<sup>10</sup>. He is justly proud of his certificate of achievement which has the seal and signature of the Dean of York and Chapter. During his years at York he has worked on every window (128) in the Cathedral and knows each and every one intimately.

About 18 months after the formation of the York Glaziers' Trust, the foreman retired and Gibson was appointed as Superintendent. In the 1970's the name was changed to 'Secretary', a position which he still holds. Both positions are really that of Chief Executive Officer and require a multitude of skills. Not only does Gibson work at the bench, but he also supervises the staff, keeps all records and books, quotes on jobs, liaises with and reports to his Trustees, the Dean and Chapter of York and all other clients and potential clients. He gives many lectures (more than 8000 over the years), sees visitors (like me), gives interviews, demonstrates and explains. He believes that education, both formal and informal is the way to ensure the survival of Britain's stained glass. Only recently has a part-time book-keeper been employed to assist him with accounts. By acting as receptionist, she also takes some of the many telephone calls. He sees the importance of his lectures but believes they are not essential to the efficient working of the Trust and therefore schedules them out of hours. I estimate that he must regularly work a 90 hour week.

---

<sup>8</sup> The Pilgrim Trust is a philanthropic trust set up by the American, Stephen Harkness who wished to support Britain for its efforts during the Great War through his gift of more than two million pounds in the 1930's.

<sup>9</sup> Peter Gibson referred to 'apprentices' - in Australia the equivalent position is 'trainee'. Unlike his apprenticeship certificate the present equivalent is an A4 typed sheet stating the bare essentials -nothing to be proud of in, Mr Gibson's view.

<sup>10</sup> Peter Gibson is critical of the present three-year training period, believing that the time is far too short for proper understanding of the craft

The York Glaziers Trust is required to 'pay its way' and its Trustees, and Gibson, are responsible for its efficient operation. Trustees are nominated by the Pilgrim Trust and the Dean and Chapter of York. Amongst them are Lord Kilmare, the present Dean, Alan Richardson, and Michael Archer, the Keeper of Ceramics at the Victoria and Albert Museum.

The Trust has undertaken more than 1000 commissions for restoration since the early 1970's.

Gibson agreed that bureaucracy is growing in the Church of England, as my discussions with Michael Archer had indicated. In some ways it is seen as necessary to protect the fabric, but in reality it can mean the watering down of recommendations as more people have their say on conservation matters. It can also delay action.

The Council for the Care of Churches has its own Stained Glass Conservation Committee (Michael Archer is Chairman) who make recommendations to the Pilgrim Trust. Conditions are placed on the use of the money, including spending it within two years and the retention of one-sixth until a final report is lodged with the Council for the Care of Churches. This is effective in ensuring recognised conservation procedures are followed.

The studio/workshop of the York Glaziers Trust is custom built over the entrance and walls to the stonemasons yard. It is a series of rooms, not very large, but well organised and not in the least wasteful of space. It is reached from an arched stone entry portal via a set of lino covered stairs.

The first room is for painting, photography and general work on the panels. Large light benches are used instead of timber benches. The tops of these are thick perspex which has been drilled at approximately 10mm intervals which allows panels to be held in place with horseshoe nails at the same time as being lit from below. It is also where rubbings of the panels are made prior to dismantling. A vertical light box with 15 fluorescent tubes (simulating daylight) is used for the photographing of panels before and after restoration. The studio is equipped with a full 'Smog-Hog' exhaust system with six 'elephant trunks' fixed above the benches. Gibson finds the system very noisy and probably over engineered for the studio situation, but his Trustees believed it was necessary for the safety of all employees. He believes the greatest danger to the glazier is during the soldering process when fumes can be easily be inhaled. Gas soldering irons are used. By employing simple hygiene (washing hands before eating, not eating or smoking in the studio etc) there is very little danger to health. He cites Samuel Caldwell as an example of the long living glazier - he was still at the bench aged 99 years and lived to 103 years.)

Glass is only re-leaded where necessary and the studio has a good supply of different lead profiles. A lead store is well protected from dust, dirt and moisture by closed boxes. There is also a glass bank.

The cementing room was spotless and removed from the painting and leading areas. Panels are cemented from both sides, the first side completed and left overnight to squeeze down, then turned over and the other side cemented. The panel is left for several days to harden before a final cleaning is done.

A small kiln has recently been installed, although painting is not a large part of the work being done at York. Paint loss is considered to be a factor of time and therefore is generally allowed to continue.



The last room is a glass, tool and equipment room. Glass is in racks along one wall and all tools and equipment necessary for removal and installation of windows are housed neatly along the other wall with a good corridor access between them. The only equipment not readily available appeared to be the scaffolding.

A small tea room is placed at one side of the linear arrangement of studio spaces. Gibson is not an advocate of tea breaks, believing they waste time and interrupt the concentration necessary for the exacting work of the studio.

One disadvantage of the studio is its siting on the first floor of the building. While under normal circumstances this is not a problem as most windows break down into panels less than a metre square, it can prove difficult to deal with some jobs. At the present time Gibson is restoring some panels by Thomas of Oxford which measure approximately 5' x 6' which were not possible to bring to the studio. In this instance he has used rooms provided by the Dean and Chapter at ground floor level.

At the conclusion of our meeting (which went well over time) he presented me with a copy of his paper on the rose window and an article he wrote on Dean Eric Milner-White.<sup>11</sup>

### **Le Centre International du Vitrail**

The visit to Chartres in France had a two-fold purpose, firstly to make the obligatory pilgrimage to Chartres Cathedral de Notre Dame and secondly to see Le Centre International du Vitrail. My interest in visiting Le Centre International was to ascertain the effectiveness of the Centre in giving the public an understanding of stained glass conservation, in all its complexity, and to gauge the Centre's suitability as a model for a similar enterprise in Australia.

Chartres is an important historical site as churches have been successively built here since 4 BC. It stands as a remarkable edifice, largely from the 13th century, and excavation of the site by the western entrance shows lime burning kilns and other evidence of an, even earlier, village complex.

Unfortunately the day was overcast and it finally rained consistently. Although the windows at Chartres shone with less than their usual brilliance, one could still be impressed by the characteristic blue light and clarity of images. I was able to examine the various restorations and recently cleaned windows alongside those which are yet to be restored. The processes are well documented by Marie Pascale Foucault in her article 'Restoring Chartres'<sup>12</sup> and other learned publications.

The primary target for the day, Le Centre International du Vitrail, is within short walking distance of the Cathedral. It was opened in 1981 by President Valéry Giscard d'Estaing. It is a collaborative venture which draws on the expertise of a number of cultural and scientific organisations and calls on the services of historians, artists, architects and master glaziers.

The President of the Foundation and the Director have developed a variety of programs, exhibitions throughout France and Europe, demonstrations, publications and conferences.

---

<sup>11</sup> 'A Treasure House of Stained Glass', extract from *The Noble City of York*, edited by Albert Stacpoole, published by Cerialil Press, 1972. (Now out of print.)

<sup>12</sup> Marie Pascale Foucault, 'Restoring Chartres' in *Professional Stained Glass*, October 1990, pp.12-15.

From the exterior, the building appears to be a row of village cottages, but the interior is an open warehouse, divided with white partition walls to separate the displays. The ceiling remains open, with great timber roof trusses exposed to view. (It looks old but I am unable to verify this.) The visitor is gently led by logical progression through the materials, processes and scientific and technological advances in stained glass conservation. The public domain is at ground level while offices and workshops are underneath. (See slides)

More than 100 000 visitors attend the Centre each year to see the displays and demonstrations. The entry charge is 15 francs, about \$A4 to \$5. The clear purpose of the Centre is education and it does this through excellent displays, videos and demonstrations.

The entrance opens into a wide area where a receptionist greets visitors (and takes their money). Behind reception is a large contemporary rose window. Tables of books, posters, cards and magazines are for sale. A small space is set aside for groups to sit and watch videos or simply to gather.

The first part of the exhibition space covers the general aspects of glassmaking. The way into the exhibits is flanked by glass panels, and one is drawn into the displays by glimpses of medieval glass. Different areas are devoted to aspects of the processes of conservation and restoration and I was impressed the integration of different disciplines. No previous knowledge is assumed, and the displays go to the basics of glass making and the materials used to make glass and glass paints.

A video screen is set up at the junction of several displays and one can sit and browse through a menu of restoration techniques. This was both slow and low level, but the potential for this type of teaching aid is enormous. It is an interactive program where choices can be made by the viewer, for example, 'the damaging effect of rain on windows'.

An atelier is reached via an area which shows many of the modern tools for restoration and painting. The display showed the housing of lead in covered boxes, some with glass lids to show the interiors. The workshop is small and bright and a reproduction cartoon of a Chartres window covers one wall. The making of this window is the current project of the atelier. The young woman working there showed us her sketch books and preparation for the work. This demonstration gives visitors a taste for the concentrated effort and patience necessary for process of restoration.

One room is set up to show the process of documentation by rubbings, then reduced size copies hatched to indicate old restoration, new restoration, damaged areas and proposed treatment. I found this particularly well explained.

The presentation of panels to show stages of development of new ( and restoration) work was shown and can be seen in the slides. For instance, the stages of painting an Art Nouveau piece, the cut lines and cartoons were also followed by a panel leaded up with only the painting on plain glass and another with only the coloured glass leaded up. The addition of a third, integrated panel would complete the set and assist visitors to fully understand the process.

The rear of the exhibition space was dedicated to explanation of the specialised restoration of Chartres windows. Much of this was done with full sized colour transparencies which gave access to the windows in a way which is impossible in the cathedral. All were well interpreted iconographically.

To one side there is a small theatre which probably runs a full program during the season for an audience of approximately 30 people at any one time.

The exit is through the bookshop area where I was able to purchase several journals<sup>13</sup> (all in French of course) on the work of the Centre and its restoration techniques.



9 Le Centre International du Vitrail, Chartres

<sup>13</sup> Of particular interest is *Vitrail: vitrail-verre-architecture*, the journal of Le Centre International du Vitrail.

## DOCUMENTATION

Current conservation practice demands that all aspects of research and treatment be recorded. The conservation of stained glass is no exception and requires particular records, including written and photographic documentation at all stages of the conservation process.

Aspects of the documentation process include:

- records of extant stained glass - location, identification;
- condition reports and specifications;
- current treatment reports;
- interpretation;
- archival storage and access.

Museum and *in situ* architectural works differ, although the examples of best practice remain very similar. The study tour offered ample opportunities to see how different professionals undertook these important activities.

### Census of Stained Glass

Possibly one of the most important international initiatives to be undertaken in recent years has been the research and publication project called the *Corpus Vitrearum Medii Aevi*. Authorised in 1952 by the International History of Art (CIHA) it originally aimed to catalogue the religious stained glass of the Middle Ages and centred around European installations and collections. Since 1971 its content and scope have been extended to include glass of the Renaissance to the nineteenth century and has become organised on a regional basis.

The Census of Stained Glass Windows in America Inc. (CSGA) has begun to establish a record of architectural stained glass in the United States, a huge undertaking in itself, but one which effectively continues the *Corpus Vitrearum* ideals. It is administered by a Board of Governors drawn from senior historians, conservators and practitioners.

The Director of CSGA is Dr Virginia C Raguin, an art historian who specialises in the history of stained glass. An energetic and meticulous researcher, writer and teacher she is largely responsible for development of the documentation format and data base. The organisation is run on a shoe-string budget, but with exceptional commitment and expertise. One of its important contributions has been the publication of a small booklet, *Conservation and Restoration of Stained Glass: An Owner's Guide*, which provides basic, easily read and understood answers to laypersons' typical questions. As it is based on clear conservation principles, it is as relevant for Australian stained glass as for American, and has had wide distribution and acceptance as a result.

The CSGA undertakes to train local volunteers to assist with documentation of their own area, offers educational assistance to tertiary students and heritage organisations, organises and participates in conferences and seminars and publishes papers.

More information on the objectives and activities of the Census of Stained Glass Windows in America is included in the Appendix.

Similar to the Stained Glass Census in America, the Royal Commission on the Historic Monuments of England has a growing photographic collection as part of an extensive *Corpus Vitrearum* archive which is an invaluable source of information, especially on lost or damaged windows. The archive is the responsibility of Sarah Brown, a respected art historian who has written extensively on stained glass in Britain, particularly on the Middle Ages. One of the very few disappointments of my tour was our inability to make a mutually satisfactory appointment, mainly because of the imminent relocation of the Royal Commission to new premises.

Peter Gibson believes that, although documenting all of Britain's stained glass is a mammoth job if attempted nationally, it becomes manageable if each Parish church takes responsibility for documenting its own windows, in other words, an iterative project of local data collection with national objectives, standards and co-ordination. There is usually a keen amateur photographer in a congregation who can make a series of photographs, one set to be held by the church, and another to be lodged with the Royal Commission. Thus the church congregation, through their involvement, learn about the windows in their care, understand their significance in aesthetic, religious and cultural terms and probably develop greater responsibility for their future care and protection.

Ideally, black and white photographs, taken in both transmitted and reflected light should be filed along with colour slides of the windows.

A similar scheme for documentation of Australia's stained glass is in its embryonic stages, and I have negotiated to integrate our data format with the Census in America and possibly the Royal Commission in Britain so that the exchange of information between organisations can be as simple and effective as possible.

### Specifications

Dr Virginia Raguin has been involved in many restoration projects as supervisory historian including Memorial Hall, Harvard, Trinity Church, Boston and she is currently supervising the restoration of a Cathedral in Kansas City.

The full cycle of stained glass windows of Harvard's Memorial Hall were recently restored it under the supervision of Bill Neely, Architect and historical stained glass consultant, Virginia Raguin. Virginia took me to Harvard and explained the restoration process in detail. The windows are all late nineteenth and early twentieth century installations and are a 'who's who' of the prominent stained glass firms of the period. Works by Henry Holiday, John La Farge, Louis Comfort Tiffany and Sarah Whitman are among them. The method of location and identification is outlined on the plan of Harvard Memorial Hall, in Appendix 10.

I was particularly interested in seeing specifications for individual conservation projects and Dr Raguin allowed me to peruse the consultative report and specifications prepared by Raguin and Associates for the restoration of the stained glass windows of the Cathedral of the Holy Cross, Boston MA

They provide an excellent guide and model for other restoration projects as the following summary of the document shows.

1 Report. (dated) This brief section stresses the urgency of restoration and recommends that the architects evaluate, plan and supervise the entire Cathedral and undertake long range planning.

2 Stonework. Specifically included to make it clear that this is not the province of the stained glass studio. Structural problems are noted with reports and dates of meetings with architect. Recommendation on need for urgent work by stained glass studio in conjunction with builder.

3 Priorities for Stained Glass Restoration. Divided into five categories from 'extremely urgent' to 'cleaning in place only'.

4 Recommendations for Selection of Studios. (i) Introduction - scale of the task; issues of contracts; standards; (ii) National Search - evaluation of bids; distance from job site; (ii) Solicitation and Evaluation - studios asked to submit a working profile

5 Exterior Protective Glazing is covered in a separate subsection with a recommendation that it should be the responsibility of a specialist glazing firm and the supervising architect should coordinate between the specialist glazier and the consulting firm. Need for venting is noted and a reference to the consequences of incorrect installation "Because of the discolouration experienced with plastics such as Lexan, they are not recommended for historical or artistically significant structures".

6 General Specifications. Layout of windows on plan.

Section 1 - Restoration policy for stained glass and historical overview

Section 2 - Summary of the work;

Section 3 - Detailed procedures for restoration.

Section 4 - Execution of Restoration

A final section gives individual specifications for each window.

7 Appendices include:

Lobby display;

Ideas for Gift and Book Shop;

Suggestions for Education and Funding.

It is a comprehensive survey of a complex project and is more than was asked for by the client. In some places I found it repetitive, but it does try to suggest a method which is workable and understandable. It is designed to be prescriptive and demands a proper level of understanding by the client and the studio of their responsibilities towards the project, and the importance of good craftsmanship.

I discussed with Raguin the extremely detailed listing of skills asked of the tendering studios. She believes that this is often misunderstood by the studio as an attempt to 'trap' or identify 'holes' in the studios expertise. She sees it as an opportunity for the studio to assess its members favourably and not as a demand for the same level of skill to be attained by all staff but it is important for the client and the consultant to be assured that the studio has the expertise to do the job.

One way of ensuring that qualified and/or experienced studios are considered was the inclusion of a studio 'working profile' with the tender. The profile is designed to give the evaluating committee a clear picture of the studio's history, personnel and associated level of expertise, recent restoration work, references and conservation policies. As the profile is an important and controversial part of the specification, I have included its requirements in more detail in the Appendix 11. There are many instances, both here and overseas, where shoddy workmanship by smart-talking entrepreneurs could have been avoided by a selection process which included a similar system.<sup>14</sup>

---

<sup>14</sup> Details, such as windows, are not always the subject of such detailed specification in Australia. I was recently asked to comment on the successful bidder for cleaning and restoration of several important windows in a historic Melbourne building. The successful firm, previously unknown to me, had submitted the lowest bid to the building contractor. On enquiry I found that the entire expertise of the firm rested with one employee who had completed a five week leadlight course. I recommended the selection of a

The need for such a safety net is considered unnecessary when the condition report and restoration will be carried out by the organisation, as is the case with the York Glaziers' Trust.<sup>15</sup> Before any bench work is undertaken by the York Glaziers' Trust, the Superintendent prepares a comprehensive, fully costed condition report. This is forwarded to the Surveyor of the Fabric who is responsible for the overall state of the Cathedral and is the link between the workshop and the Dean and Chapter. Archdeacons are legally responsible for the fabric and as such are highly important to the stained glass conservator. (Peter Gibson has lectured to them as a group, and feels that is desirable to educate this group of clergy, and their equivalents in other denominations, above all others.)

His report goes forward to the Cathedral Advisory Fabric Committee, a statutory committee of the Dean and Chapter, who then inform the Dean and Chapter. If the report is for windows in a Parish church then it goes to the Diocese Advisory Committee. In the event of a positive outcome then the Parish can apply for funds from the Pilgrim Trust through the Council for the Care of Churches.

### **Documentation of Processes**

Just as important as the 'before' documents are the 'during' documents which should be undertaken as a matter of course throughout the restoration/conservation process.

Museum conservation processes were exemplified by the approach of Mary Clerkin Higgins. Clerkin Higgins first studies as many sources as possible, - articles, 'Studies in the History of Art' (Corpus Vitrearum Series), gallery files and archives etc. - including the glass itself to establish, as closely as possible, the original intent of the artist and to ascertain whether previous restorations have been undertaken. She investigates as many avenues as possible in order to make informed and rational judgements for the present restoration. The panels are photographed and rubbings are made of both sides of the glass prior to dismantling.

At each stage of restoration, the process is photographed and documented. Frequent discussion takes place between the museum and the conservator, and with any assistant on the team. The final piece is shipped back to its home with a fully documented report of the process.

Chapel Studio in the UK makes particular use of the rubbings by reducing them in size photographically so that they can be annotated diagrammatically to indicate the type and extent of restoration to each panel. This becomes an invaluable document for both conservator and client.

The Victoria and Albert Museum and the Cathedral Studios of Canterbury gave me pro forma condition and treatment reports which are included in full as Appendices 13, 14 and 15. Canterbury undertook a similar process to that in operation at York and all studios emphasised the documentation process as much as the importance of excellent conservation processes.

Most studios used the Corpus Vitrearum system of notation to indicate different treatment to be undertaken. As this system has proved highly satisfactory it seems logical for it to be generally accepted as the universal 'language' for present and future conservation

---

reputable (higher) bidder but the cost for this selection would then be borne by the architect; his alternative was to produce a condition report, (even at this late stage), and gain agreement from the selected tenderer.

<sup>15</sup> A word of caution! While this system works well in the case of a cathedral studio where all staff are accountable, it may be much harder to gain an independent assessment of the need for restoration if the consultant is also the conservator.





## Restoration Techniques

Despite remarkable advances in restoration techniques over recent years there remain many areas of contention on appropriate methods for this skilled work. Without exception, studios believe that they are achieving high standards and quality craftsmanship, but they have different methods for achieving this end and often take opposite views on appropriate methods, and there is not always universal praise for the results.

The underlying principles which guide most studios are the artistic integrity of the panel under restoration, the maintenance of all original material and the ability to 'read' the restored panel. To give a brief example, some panels have been broken so often they are a network of black lead lines, often across faces and other important aspects of the composition. By edge-gluing, instead of leading, the readability of the piece is enhanced. In less sensitive areas, say robes or background, it may be more appropriate to copper foil or re-lead. No studio I visited would consider using a new piece of glass if the old was at all able to be restored.

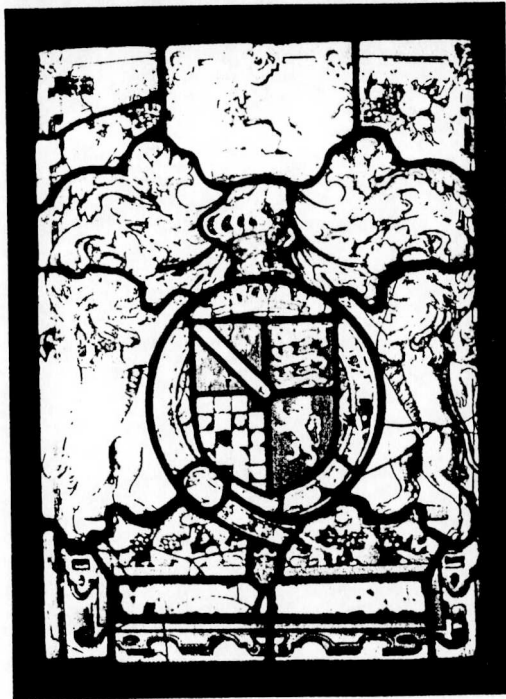
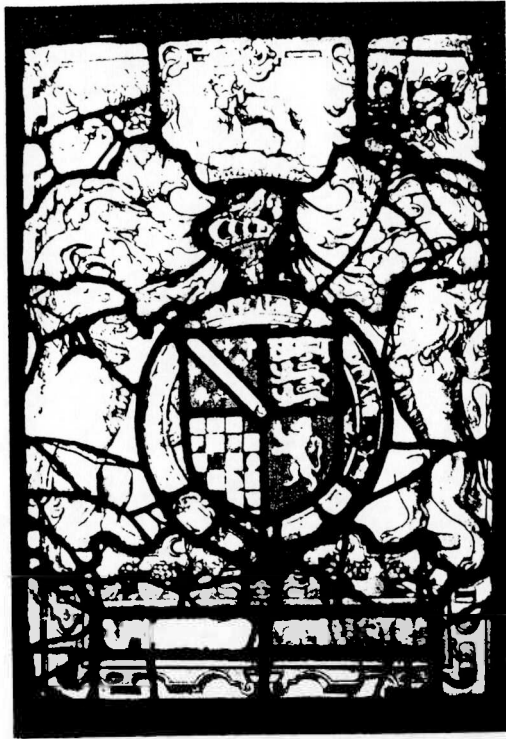
In the following section I have singled out adhesives, protective glazing, cleaning methods and painting as the most controversial techniques, both here in Australia and overseas.

### Adhesives

In recent years a number of products have become available which combine the essential properties of equal density and strength as glass, clear and non-yellowing and claiming to maintain these properties over time. Also important is the reversibility as referred to in the Burra (or Venice) Charter. Samantha Whitney at the Victoria and Albert Museum provided me with a full list of materials and suppliers, see Appendix 15.

Dr Stephen Koob at the Corning Glass Museum believed HXtal, a two-part epoxy to be one of the best adhesives currently available. It flows easily and its refractive index is comparable with glass. The process can be reversed, that is 'un-glued', albeit with difficulty. It is harder to control than some other adhesives but few problems have been experienced by users and, after ten years of use, remains in a satisfactory condition. HXtal had developed a problem with yellowing and thickening of the hardener, but Koob believed this was an isolated case with a single batch. His 'pet hate' is silicon, which he thinks will be the nightmare of conservators in the future.

Daniel Maher and Mary Clerkin Higgins are conservators who use HXtal epoxy resin for most restoration jobs where the break is clean, small infills are needed, small pieces are missing, the surface is badly chipped or the glass has been grossed prior to an earlier leading. In all these cases the remnant hole is filled by the placement of tape on the back of the glass and flowing the adhesive into the cavity. It sounds relatively easy, but, like all processes, it takes some skill to correctly manage. HXtal can be coloured to match glass and some work has been done on suitable colouring agents. Painting can often be chipped along the line of the break and, for visual purposes, these are repainted with cold paints. The glued, uncured pieces are taped and stood on edge in a bed of sand for the duration of the curing period. One of the disadvantages of HXtal is its curing time of approximately seven days.



11 16th century Heraldic glass from the Chapel at Trinity Hospital, Greenwich, 'before' and 'after' restoration by Chapel Studio

Unlike the museum conservators, Chapel Studio prefers to use a Ciba-Geigy 2-part epoxy resin, XW396/7 rather than HXtal. Their objections to HXtal were the long curing period and the level of skill required to successfully use it. The Ciba Geigy epoxy is of a similar density and whiteness to the glass. Finebond, an epoxy designed by Norman Tebbett, is also used at Chapel. They prefer to keep infills small, less than a centimetre across, and cut new glass for larger infill spaces. Preparation for infills of resin are done by gently embedding the original glass in dental wax and filling the holes with the resin.

Peter Gibson at the York Glaziers' Trust prefers silicon for fixing breaks in glass. He first used silicon to restore the south rose window of York Minster after a disastrous fire in 1984. The heat of the fire cracked the window into 40 000 pieces. Gibson's solution was to silicon smaller pieces back to their original size and sandwich the pieces between two thin sheets of glass before re-leading along the original lead lines. The breaks are not visible from the floor of the Cathedral and Gibson says that, after ten years, there is no sign of problems developing.

## Cleaning

Bob Wysocki told me the story of the thoughtful parishioner whose Good Deed for her local church was to religiously[?] clean the entire interior annually, at the conclusion of the tourist season. Walls, pews, carpets, floors and windows were all given a thorough cleaning. Over the years there were signs of a white deposit on the interior surface of the window lead, although none was visible on the exterior - a reversal of the usual problem. Bob Wysocki was asked his opinion of the problem and as he tested the surface with a coin, to scratch the deposit back, the leaf of the lead broke away from the heart indicating the total deterioration of the metal.

The problems resulted from cleaning the windows with lye soap which ate into the lead over the years. The windows had to be totally re-leaded.

While most cleaning operations are neither as drastic nor as damaging as this instance, the guiding principle for current conservation practice is to undertake minimum cleaning, with minimum physical and chemical invasion, whether *in situ* or in the studio. Bob Wysocki's maxim - 'If you need to wear rubber gloves - forget it!' He uses distilled water and paper towel.

For conservation work to be undertaken the panel is usually dismantled and the lead usually discarded.<sup>16</sup> Mary Clerkin Higgins initially cleans the glass, first in a bath of distilled water to remove excess loose dirt, then in mild soapy water as she gently scrapes the surface with a razor blade to remove putty residue. An electric eraser is a highly effective tool for the removal of more stubborn ingrained dirt. During this process, a close watch is kept to make certain that no part of the process is damaging the glass or paint. The glass is laid out in order at all times and placed on lint free, Ph-neutral paper.

At the Victoria and Albert, glass is cleaned with Synperonic N, (previously called Lissapol) a non-ionic detergent that is used in de-ionised water.

---

<sup>16</sup> The conservation or reuse of lead is a contentious issue in some circles but generally lead is discarded when it loses its flexibility and therefore can no longer be relied upon to 'work' in the window.

Cleaning of York Minster panels is done as far as possible with water and very mild detergent. However, unlike museum conservation, it is not essential to remove every small piece of old cement and dirt. Although Peter Gibson has equipment for ultrasonic cleaning of glass and an abrasive machine, similar to a tiny sandblaster, with a nozzle about the size of a flexidrive engraver bit, shoots fine particles onto the surface of the glass, both methods are now out of favour and considered to create more problems for future conservators. The equipment remains, while research continues in the hope of finding an abrasive which is kinder to the glass surface.

Professor Roy Newton and others are continuing to experiment with fine abrasives, including glass beads, finely crushed almond shells, stone dust and sodium bi-carbonate. Results from these experimental techniques are expected to be published later this year.

### Protective Glazing

While protective glazing is a big issue, (and also big business) in Australia, my discussions with overseas studios suggest that it is not recommended except in extreme circumstances.

Protective glazing is used for two reasons - most frequently for vandal protection and, to a lesser extent, environmental/climatic control. Protective glazing may be with glass - double- or even triple-glazed - or polycarbonate sheeting. Isothermal glazing is another method which has found favour recently. This involves the removal of the window and its replacement with either polycarbonate sheeting or glass. The stained glass is then re-hung on the interior of the window niche, often reinforced by a frame of brass. This method allows air circulation all around the panel, diminishing deterioration from climatic factors, however, this method can hardly be described as non-invasive.

Glass may simply be float or window glass although Du Pont have developed a laminated glass sheet (for windscreens originally) which is 3' or 4' in width and up to ten feet in length. The laminate film in the new wide glass is *Butacite*, a polyvinyl butyral (PVB) which has many advantages: it cuts 28% more UV than glass, there is a reduction of noise from external factors; and the inflexibility of the glass stops damage to the inner stained glass by wind pressure. This results in savings to the church over years by reducing maintenance, although the initial cost is far greater than float glass.

The polycarbonate sheet, Lexan, made by General Electric, is guaranteed for 3 years and the newer version, Lexan XL (extra life) is guaranteed for 5 years. Bob Wysocki has experienced Lexan which has become thin and brittle 'like Kraft paper'. Its flexibility and strength make it a good protector against vandals, but it scratches easily and yellows in a short space of time.

The addition of protective glazing may cause new problems associated with ventilation of the air space between the outer and inner skin of glass. Bob Wysocki believes that there is no need for ventilation if the outer sheet is placed so that it does not completely cover the outer (timber) frame and is therefore allowed to 'breathe', and the setting of the inner stained glass panel is between 3/4" and 1" from it. A larger gap will result in a condensation/evaporation cycle to build into a destructive microclimate. Two views on protective glazing are included as Appendices 17 and 18.

Steven Clare at Chapel Studio, told me that although protective glazing is advertised as one of their services they prefer to only install it as a vandal-proofing strategy. Through observation and experimentation, they believe that a 5 to 10mm. gap between the inner and outer glass is a reasonable space, allowing sufficient air flow.

The York Glaziers' Trust has recently replaced the great West window after extensive restoration of stonework and the installation of protective glazing. The window was removed because of crumbling stone work and the cutting of new stone allowed a second glazing groove to be incorporated, a unique opportunity which allowed an external glazing layer to be installed on the outside without any recourse to isothermal glazing. The glass of the external layer follows the main lead lines of the original window and saddle bars have been similarly installed. Ventilation is to this external layer and not to the interior of the building as is the more common practice.

Professor Roy Newton installed extensive monitoring equipment at York to try to scientifically determine which ventilation practice was 'correct' and believes that the external method does not have any harmful effect on the glass. During the trials which extended over many months, Peter Gibson was required to climb the west wall and read dials every couple of hours to record these figures for further analysis!

Gibson is totally opposed to the use of Lexan or other polycarbonates for the protection of windows, mainly because it discolours and scuffs in such a short time that it impairs the vision of the stained glass and is most unsatisfactory as a long term measure. If the client is convinced of its effectiveness (particularly for vandal proofing) then it should be clearly stated by the conservator that it will need to be replaced in a few years. It should only therefore be considered where it can be justified because of repeated vandalism.

His views on isothermal glazing are similar. The damage to the stonework alone makes it an unsatisfactory method of protection and he believes that it is our responsibility to preserve the original intention of the architect, as well as the artist, and retain the window in its original position: rearrangement alters the aesthetic intention.

He recognises that there are differences between medieval and nineteenth century stained glass windows which present different problems to the conservator, but these do not necessitate the use of expensive and overkill methods, such as isothermal glazing. Nineteenth century glasses are brittle, they may require different, gentler cleaning methods, and suffer from the poor painting techniques generally used during the period, but none of these problems will be overcome by overly scientific solutions such as isothermal glazing. Any proposed solution to problems of conservation should qualify under aesthetic, scientific and budgetary criteria. He believes that a good maxim is to only do work which is necessary and not to try to solve all problems for all times (which proponents of isothermal glazing are prone to do).

The first windows at York to be externally glazed were done in 1950. They were of 15th century French glass which was glazed with a diamond leaded pattern to preserve an aesthetically sensitive texture on the exterior.

This method of double glazing is not so satisfactory when viewed from inside as the diagonal lines interfere with the myriad of lead lines in the medieval glass. Many of the windows are mosaic glass which has been broken over the years so that they have become more difficult to 'read' anyway, without the addition of further line work. Another alternative, which has been used at Canterbury also, is glazing the outer layer of glass using the main lead lines from the internal layer. While this is a significant improvement on the diamond leadlight technique, there is still a certain interference from the lead lines, depending from where one views the window.

Gibson also points out that despite their age and condition only 80 of the windows of York Minster are protected and there are no immediate plans to continue the program.

## **Painting Techniques**

When we consider the effect of time, climatic conditions and human interference, medieval windows are remarkable for the longevity of their paintwork. Nineteenth century painting is not showing the same longevity and paint loss is already a major problem. Studies indicate that an excess of borax in the paint, coupled with little-understood firing techniques may be the root causes. Restoration of painting is rarely attempted on medieval glass, most conservators preferring to allow the painted images to fade with time, and the general opinion is that original glass should never be repainted or re-fired.

In some instances, such as being able to 'read' the window, a decision is made to restore the paintwork. In accordance with the Venice Charter, the original is not replaced with new painted and fired glass: if it is necessary to restore glass which is thin or where paint loss has occurred, a backing plate is made. New glass is carefully selected to match the colour, texture and density of the older glass and fired in an investment plaster mould which has been made from the original glass. Usually 1mm glass is used but occasionally 2mm glass is used if the original glass is extremely thin. This is painted with 'missing' sections of paint work, fired and plated to the original with aluminium tape, (similar to copper foil), which is sticky on one side. This holds the two sheets together while it is leaded into the window again.

Chipped painted edges are cold painted with Intenso, a cold oil-based sign-writers paint. Acrylics, water-based, are also used where appropriate. The date of the replacement is minutely painted onto the piece to identify it from earlier repairs and original work. All studios and conservation departments dated this new addition. Chapel Studio marks the face of the glass so that it can be seen up close but it remains quite indistinguishable by the casual observer.

## **EDUCATION AND TRAINING**

A subsidiary aim of my study tour was the identification of educational opportunities, both formal and informal, which would be of benefit to Australians wishing to extend their knowledge and skills in conservation of stained glass and appropriate courses for future International Specialised Skills Fellowship recipients to undertake.

### **Formal Courses**

Tertiary courses in general conservation studies have increased in recent years and I identified a number in the USA, several of which specialise in glass conservation.

The Conservation Center of the Institute of Fine Arts, New York, runs a four-year program which is a basic course of two years Art History, one year Conservation Studies and one year Internship, usually undertaken in a museum conservation department. Columbia University Graduate School of Architecture courses emphasise architectural preservation, but they do offer a course in stained glass every few years. The University of Delaware/Winterthur has an Art Conservation Program of three years duration - two years of formal studies and one year internship. The State University College at Buffalo also offers a three year stained glass program. I have contacted these institutions for more details of their programs and fee structures.

I had not planned to visit English tertiary institutions as I had made a detailed study of undergraduate glass courses in 1989, but an unexpected opportunity allowed me to visit the Chelsea School of Art and the Central School of Art, Holborn, London. Both schools are now part of the amalgamated London Institute. Chelsea School of Art at Shepherds Bush offers a BA in Public Art which can be followed by a MA in Public Art. Central School offers a Post-graduate Diploma in glass studies and will introduce a MA conversion program in 1995. Both courses provide good foundation studies for students wishing to pursue specialist studies in conservation.

The Royal College of Art and the Victoria and Albert Museum are jointly co-ordinating a conservation course which includes stained glass as one of the major areas. Full details are included in this report as Appendix 5. The course is a balance of theory and practice with the first year providing a broad training. Students are expected to pick up areas of study in which they may be lacking skills or knowledge. The course also links with the Imperial College where students are encouraged to improve their scientific backgrounds. The second year emphasis is on practical skills and final year includes a major research project (40%) and intensive practical project (60%). Students are expected to gain work experience outside the college during the summer vacation.

The introduction of this course underlines the commitment of both institutions to the expanding role of conservation, particularly in museums. It has raised the skills of practitioners and, more importantly, increased understanding of the philosophy and issues associated with aesthetic and cultural aspects of conservation.

Marie Pascale Foucault directed me to Marie-Francoise Dromigny, Professor at L'Ecole Nationale Supérieure Metiers d'Art et Arts Appliqués in Paris. Unfortunately, I was unable to make contact with her, but I have written since arriving back in Australia, requesting details of their courses.

### **'On-the-Job' Training**

While formal apprenticeships are, regrettably, no longer available in either the USA or UK, there are instances of traineeship-style employment. Both York Glaziers' Trust and Canterbury Studios offer these training opportunities. "On-the-job" training in the form of internship is a part of the formal tertiary courses.

I was particularly keen to see if any places may exist for Australians with suitable prior knowledge and skills to be accepted into this type of workshop, where they would gain experience in high quality conservation and restoration techniques. Dr Sebastian Strobl at Canterbury was certainly very willing to pursue the possibility of taking on a suitable trainee at some stage. The trainee would be responsible for his/her accommodation and living expenses and although it would not be a paid position, there would also be no training fee and insurance would be covered by the workshop. He would consider a term of some months as a suitable period for 'learning the ropes'. As we had little time to fully discuss the possibility, I would like, with the Board's approval, to pursue the offer in greater detail, with the possibility of offering a targeted Fellowship from International Specialised Skills in the future. An opportunity of this type would be of enormous benefit to conservation of Australian stained glass.

The British Society of Master Glass-Painters, as the peak stained glass organisation in Britain, has taken the initiative in the formulation of National Vocational Qualifications for stained glass. In future, only those courses that conform to the framework of this national scheme will be eligible for subsidy. The positive results of the introduction of NVQs will be a unified standard for vocational training, filling the gap left by the breakdown of the apprenticeship system.

## **Short Courses**

I was made most welcome at The Victorian Society by its Director, Dr William Filmer-Sankey. I also spent some hours with their former Secretary, Teresa Sladen, an expert on stained glass of the Victorian period. The Victorian Society runs a Summer School in July each year - 1994 is the 20th annual program. The School is designed to provide a comprehensive survey of Victorian and Edwardian architecture, decorative and fine arts, interior decoration and design. Lectures by distinguished scholars and site visits to many fine architectural examples, often not open to the public, are conducted over an intense three week period.

In November 1993, the Victorian Society and the Society for Antiquaries hosted a joint conference on Gothic Revival Stained Glass. The event was so successful that another is planned for this year. The British Society of Master Glass-Painters held a similar symposium earlier in the same year, entitled The Conservation and Restoration of Stained Glass, its Philosophy and Practice. The overwhelming support for these events indicates an enthusiasm among practitioners and the public for further enlightenment, a situation which is mirrored in Australia.

Le Centre International du Vitrail also offers short courses in restoration, particularly in painting techniques, through the summer period. Mary Clerkin Higgins participated in the Summer School (July) two years ago. All sessions are conducted in French, but Le Centre International provides interpreters who are skilled in two (or more) languages and who are also experienced conservators, like Marie Pascale Foucault who has been an interpreter on more than one occasion. Clerkin Higgins felt that the inability to speak the language had been quickly overcome as the important conservation work absorbed her interest and provided common ground.

## **Registration and Accreditation of Stained Glass Conservators and Restorers**

The need for standards to underpin the conservation of stained glass has become more apparent with the influx of non-professionals with inadequate training and experience offering their services to unwary clients. Inevitably, the client must bear some responsibility, but many continue to be impressed by glossy brochures and inflated or ignorant claims.

Since the 1980s, the Stained Glass Association of America has attempted, through its Restoration Sub-committee, to accredit practitioners in the field of restoration. Bob Wysocki headed this committee until recently and, by his own admission, found it a difficult situation. Initially he simply sent out a letter asking studios to reply with details of how they went about the process of restoration. He received a variety of replies ranging from 'I take the window out and take it back to the studio to repair it', to a couple of newspaper clippings, to a fully documented check-list from start to finish including photography, cleaning, re-installation. The initial, 1980's list was limited and also included a number of non-members of excellent repute, an action which caused some angst in SGAA at the time.

There is still no register of accredited conservators in the US. Partly because of the difficulty of peer group assessment, the current running is being made by the American Institute for Conservation of Historic and Artistic Works (AIC) and conservators like Mary Clerkin Higgins and Dr Virginia Raguin are hopeful of a positive outcome.



In Britain the process is much further advanced and funding is currently being sought for a pilot project later this year. A sub-committee of the British Society of Master Glass-Painters, headed by Agnes Holden, has been deliberating the issue for some time with the assistance of many experts including Alfred Fisher, Peter Gibson, Dr Sebastian Strobl and Sarah Brown. Applicants to the scheme will be assessed by specialised assessors and the scheme will operate on a number of different levels (5), embracing all aspects of restoration and conservation. The studio, rather than individual practitioners, will apply for accreditation at a particular level and will be examined by a panel of three members of the sub-committee as part of the accreditation process. The register of accredited studios will be endorsed by the British Society of Master Glass-Painters and any client seeking the advice of the Society will be supplied with a list of reliable, competent and experienced craftspeople. Further details of the scheme will be forwarded to me after final ratification by the British Society for Master Glass-Painters.

Similar plans in Australia also suffer problems of assessment, with many studios unwilling to submit to competitor scrutiny. In Britain, people like Agnes Holden (V&A Conservation of Stained Glass) and Michael Archer (CCC and V&A) are seen as unbiased and without financial interest in the scheme. If a scheme of this type is to be introduced here, it is important to identify 'arm's length', competent assessors with the respect and confidence of the majority of participants to act alongside specialist practitioners. As in USA and Britain, the issue of accreditation in Australia is clearly urgent and important.

## OUTCOMES

The opportunity to gain the experience and knowledge offered by my participation in this study tour has resulted in many new opportunities for developments in Australia.

The need for an Australian Centre of Glass, of which Conservation and Restoration are an important part, remains high on my personal agenda for implementation in the coming twelve months. A full report and strategy plan for this scheme is in preparation by myself and Carolynne Bourne and will be presented to the Board and Monash University as soon as possible.

The network of contacts throughout the world has already proved to be of benefit to others intent on research in the field of stained glass conservation and I have been able to direct students and researchers to a range of overseas sources. The training sessions that are planned as part of my on-going commitment to International Specialised Skills will extend the knowledge and understanding of various issues, many of which are outlined in this report.

As an outcome of my discussions with Dr Virginia Raguin, I was invited to present a paper at the International Seminar on Stained Glass of the 19th and 20th Centuries, part of the Annual Meeting of the Society of Architectural Historians in Philadelphia, April-May 1994. Although I was unable to attend personally, my paper was read by Dr Raguin and will be published in August as part of the proceedings. I have also been invited to submit a paper on Australian glass to the SGAA quarterly magazine, *Stained Glass* for publication in the International Spring Issue.

In April I presented a public lecture as part of the School of Art, FORUM Series of Extension Lectures at the Peninsula Campus, Monash University outlining the aims of the study tour and focussing on practical conservation issues as they relate to Australian conditions.

Conservation of stained glass in Australia is at a crucial point. Professional and community interest in heritage issues has never been greater as Australians recognise the importance and value of our history. Stained glass is an important part of that history and its careful management and care is a vital architectural component. Many eminent conservators stress the need for a long term view, and the need to encourage long-term thinking within the stained glass fraternity. Makers should be encouraged to build new windows which will last for hundreds, not tens of years, and conservators and restorers should recognise their responsibility to conserve the past glories in glass for future generations.



# APPENDIX 1

## STUDY TOUR ITINERARY January - February 1994

DAY	DATE	FROM	TO	MODE	DETAILS
1	2-Jan-94	Melbourne	Cairns	Air	dep MEL 0700, arr Cairns 0910, dep Cairns 2100, arr LAX 1835
2	3-Jan-94	Cairns	Washington	Air	dep LAX 2300[2nd], arr Balt/Wash 0645
3	4-Jan-94		Washington		Smithsonian White House etc
4	5-Jan-94		Washington		Washington National Cathedral
5	6-Jan-94		Washington		Fred Barnstein 410-605 7000 ext 6569 (VA Hosp)
6	7-Jan-94	Washington	Raleigh	Train	Carolinian-0911 Baltimore,1003/1040 Washington,1626 Raleigh
7	8-Jan-94		Raleigh		Robert J Wysocki
8	9-Jan-94	Raleigh	Rochester	Train O/N	Empire, 1150 Raleigh, 1750 Wash -2210 Wash, 1348 arr Rochester
9	10-Jan-94	Rochester	Corning	Bus	
10	11-Jan-94		Corning		Corning Glass Museum
11	12-Jan-94		Corning		Corning Glass Museum
12	13-Jan-94		Corning		Corning Glass Museum Corning Book Exchange
13	14-Jan-94	Corning	Rochester		Corning Glass Museum
14	15-Jan-94	Rochester	Boston	Bus/Train	0745 Syracuse, 1425 Worcester, 1535 Boston
15	16-Jan-94		Boston	Car/etc	Virginia Ragon Boston Museum of Fine Arts
16	17-Jan-94		Boston		Trinity and other Churches Studio visits, Harvard
17	18-Jan-94		Boston		
18	19-Jan-94	Boston	New York	Train	St Vincent Ferrer Guggenheim Museum
19	20-Jan-94		New York		St Patrick's Cathedral St Thomas
20	21-Jan-94		New York		Mary Clerk Higgins 'St Ann Center for Restoration & the Arts
21	22-Jan-94		New York		Statue of Liberty, Empire State, UN,Grand Central at dusk!!!
22	23-Jan-94		New York		Metropolitan Museum of Art
23	24-Jan-94	New York			Cloisters Museum Conservation Department dep JFK 1900
24	25-Jan-94		London	Air	arr Heathrow 0650
25	26-Jan-94		London		
26	27-Jan-94		London		Chapel Studio
27	28-Jan-94		London		Chelsea School of Art
28	29-Jan-94		London		
29	30-Jan-94		London		British Museum
30	31-Jan-94		London		Hist Mon Royal Comm Central School
31	1-Feb-94		London		Brit Soc Mast Glass Pntns Victoria & Albert
32	2-Feb-94		London		Victorian Society Goddard & Gibbs
33	3-Feb-94	London	Canterbury	Car	P/U Rover Gp C, Earl's Crt, 0900 \$648 pd
34	4-Feb-94		Rusper	Car	Jane & David Charles
35	5-Feb-94	Rusper	Norwich	Car	David Reekle
36	6-Feb-94		Norwich	Car	Local churches
37	7-Feb-94		Norwich	Car	Norwich Cathedral Norwich Art Centre
38	8-Feb-94	Norwich	York	Car	Sainsbury Centre for the Arts
39	9-Feb-94		York	Car	Selby Abbey
40	10-Feb-94		York	Car	York Glaziers' Trust Peter Gibson
41	11-Feb-94	York	Gloucester	Car	Gloucester Cathedral Forest of Dean
42	12-Feb-94	Gloucester	Bristol	Car	Two days in Somerset and Devon
43	13-Feb-94		Bristol	Car	
44	14-Feb-94	Bristol	London [near	Car	Morris & Juliet Venables-Roy W Coomber
45	15-Feb-94	London	Paris	Car - Air	Dep Heathrow 1115, arr Ch de Gaulle 1320. Car drop off Heathrow 0900.
46	16-Feb-94		Paris		S. Chappelle S. Odile
47	17-Feb-94		Chartres		Chartres Cathedral Centre International du Vitrail
48	18-Feb-94		Paris		Louvre etc
49	19-Feb-94		Paris		Pompidou Centre Les Halles
50	20-Feb-94		Paris		S Louis Musee d'Orsay
51	21-Feb-94	Paris	London		Dep C de Gaulle, arr Heathrow , dep Melbourne
			Melbourne		
52	22-Feb-94				
53	23-Feb-94		Melbourne	Air	Arr MEL 1030

# Harry Clarke and His Geneva Window

by Mary Clerkin Higgins

## History

In 1926, the government of the Irish Free State approached one of that country's foremost artists, Harry Clarke, to commission a stained glass window for the offices of the International Labour Conference of the League of Nations in Geneva. Clarke was 36 years old at the time and at the height of his career. He was known internationally for his intense, detailed and imaginative stained glass designs, as well as for his often macabre and bizarre book illustrations. His work, Symbolist in nature, showed a great originality in composition and a masterful use of color.

*The Geneva Window* (Figure 1) was to be an official gift from Ireland to the League. Clarke traveled to Geneva to examine the site and suggested a suitable location in a stairwell. The government left the choice of subject matter to Clarke, who decided upon modern Irish literature, and with the help of friends Lennox Robinson, William Butler Yeats and others, he selected 15 writers and works to illustrate: *The Wayfarer* by Patrick Pearse, *The Story Brought by Brigid* by Lady Gregory, *Saint Joan* by George Bernard Shaw, *Playboy of the Western World* by John Millington Synge, *The Others* by Seumas O'Sullivan, *The Demi-gods* by James Stephens Juno, *The Paycock* by Sean O'Casey, *The Dreamers* by Lennox Robinson, *The Countess Cathleen* by William Butler Yeats, *Mr. Gilhooley* by Liam O'Flaherty, *Deirdre* by George Russell (known as AE), *A Cradle Song* by Padraic Colum, *The Magic Glasses* by George Fitzmaurice, *The Weaver's Grave* by Seumas O'Kelly, and *On Music* by James Joyce.

Work did not begin on the commission until the end of 1927, then progressed very slowly, due to Clarke's numerous other commitments for windows and book illustrations, as well as to the administration of the family stained glass studio and decorating firm. Even worse, Clarke was battling a progressively deteriorating case of tuberculosis. In March, 1929 his doctors insisted that he travel to a sanatorium in Switzerland for convalescence, returning to Dublin over a year later, in May of 1930, to complete work on *The Geneva Window*. It was ready for viewing by September when President Cosgrove of Ireland and other officials came to examine it.

Immediately, President Cosgrove had misgivings. He wrote Clarke, saying that "For several reasons I consider that it would not be desirable to include the panel which contains a representation from the books of Mr. Liam O'Flaherty." His objection to the panel of semi-nude Nelly dancing before Mr. Gilhooley (Figure 2) may have been both to the imagery and to the fact that some of O'Flaherty's work was banned at that time by the Censorship Board. His objections grew and he soon wrote Clarke that, "the inclusion of scenes from certain authors as representative of Irish literature and culture would give grave offence to many of our people."

He was hardly alone in that opinion, for as an interview with Mr. R.C. Ferguson, the Secretary of the Department of Industry and Commerce at the time and one of the first officials to view the window, reveals, it was felt by many government officials that "Nakedness was something they we're prepared to accept as an artistic requirement, but never nakedness which so suggested sex. . . . What harm if this window could be smuggled out to Geneva—but there would be no avoiding the opposition of politicians, churchmen and the newspapers. A nation famed as a Catholic stronghold was to be represented as a bizarre almost viciously evil people steeped in sex and drunkenness and, yes, sin." (Figures 3, 4, 5) Politically, there was no possibility that the government would send the window to Geneva.

Harry Clarke, still in fragile health and not disposed to compromise on the window, returned to Switzerland in October, immediately after the viewing, and died there three months later. Officially, the government never said outright that it was abandoning the project; indeed, they paid the agreed sum, in full. However, panels were collected, temporarily went on display, and were then put in storage. Clarke's widow, Margaret, was very unhappy with the commission's outcome and tried in vain either to get the government to send the window to Geneva, which she knew would probably never happen, or to sell it back to her. In 1933, after the installation of a new government, she was allowed to buy the ensemble back for the amount originally paid. The window remained in the family until 1988 and, for part of that time, it was on extended loan to the Hugh Lane Municipal Gallery in Dublin.

*continued on page 19*

Figure 1. The Geneva Window, Harry Clarke, 1930, 75" x 41". Before Restoration. The restored window will be unveiled during the Wolfsonian's inaugural exhibition in January 1995.

continued from page 17

In 1988, the family sold the window to collector Mitchell Wolfson Jr. It is to be on permanent exhibition in the Miami, Florida headquarters of the Wolfsonian Foundation, (Figure 6), as soon as construction for the new museum facility is completed in 1995. It will be part of the Foundation's inaugural show, 'The Arts of Reform and Persuasion, 1885-1945.'

While much of the show will travel to sites around the United States, Europe and Japan, *The Geneva Window* will remain in Miami Beach. The Foundation is dedicated to "furthering scholarship, conservation, preservation, education and appreciation of the art and history of the period 1875-1945." As its name suggests, this important and fascinating collection concentrates on the decorative and propaganda arts; that is, art that was not made solely for arts' sake.

As with the rest of the history of this window, its sale was also controversial. By allowing this powerful and historic piece to be purchased and sent overseas, lost to Ireland forever, Brian Fallon remarked in *The Irish Times* that, "We have, quite simply, disgraced ourselves again."

#### Technique

Although Clarke was not the first to employ the techniques used in *The Geneva Window*, he was a recognized master of them. The entire ensemble is double-plated, with the two pieces of glass held in a single lead, one directly behind the other. Plating is often used to obtain a greater richness and depth of color, or to tone a color. In Clarke's hands, it was used to obtain a much greater variety and intermixture of color.

Most of the glass in the ensemble is flashed. When the glass is still a molten gather, a thin layer of one color is placed over and attached to a thicker layer of another color. This gather is then blown into a cylinder and subsequently flattened into a sheet of glass. Most antique red glass is flashed. Any color however, can be flashed and a whole range of combinations can be achieved—red over clear, red over blue, blue over yellow, and so forth.

By the fifteenth century, it was realized that a craftsman could remove the layer of flash by abrasion with a sharp tool to reveal the base glass below—a very labor intensive process, enabling the artist to have two colors on one piece of glass without a necessary lead line. In the nineteenth century, hydrofluoric acid was used to remove the layer of flash, making it possible to eliminate all or only a part of the flashed layer, depending on the amount of time the glass was exposed to the acid, as well as allowing for much more subtle and varied tones of color than were possible with abrasion.



Figure 2: 'Mr. Gilhooly,' by Liam O'Flaherty.



(above) Figure 3: 'Deirdre,' by George Russell (known as A.E.)



Figure 4: 'The Others,' by Seumas O'Sullivan.

With *The Geneva Window*, any area that was not to be touched by the acid was protected with a wax resist, while areas to be acidified were left uncovered. The glass was either dipped into the wax with some wax then being removed, or hot wax was applied very precisely with a pen. The glass was then placed in a hydrofluoric bath until the proper amount of flash was removed. Clarke would do this as many as six separate times, adding or removing wax resist along the way, in order to obtain many intricate details and various shades of color down to the base, on the one piece of glass.

In the scene from 'Juno and the Paycock' (Figure 7) we see the two layers of glass plating side by side. In Figure 8, the two layers are stacked as they would be in the leads. Both the front and back layers have been acidified and the varying depths of color can be clearly seen. The deepest shade of color was completely protected during the acidifying procedure; the clear areas indicate where the flashed layer has been completely removed, revealing the color of the base glass. Acidifying with hydrofluoric acid is a very hazardous procedure necessitating a great deal of care and skill, especially for acidifying as detailed as this (Figures 9, 10, 11).

After the glass was acidified, it was painted using silver stain and vitreous paint. The silver stain consists of a silver salt applied to the glass. Upon firing in a kiln, it forms a colloidal



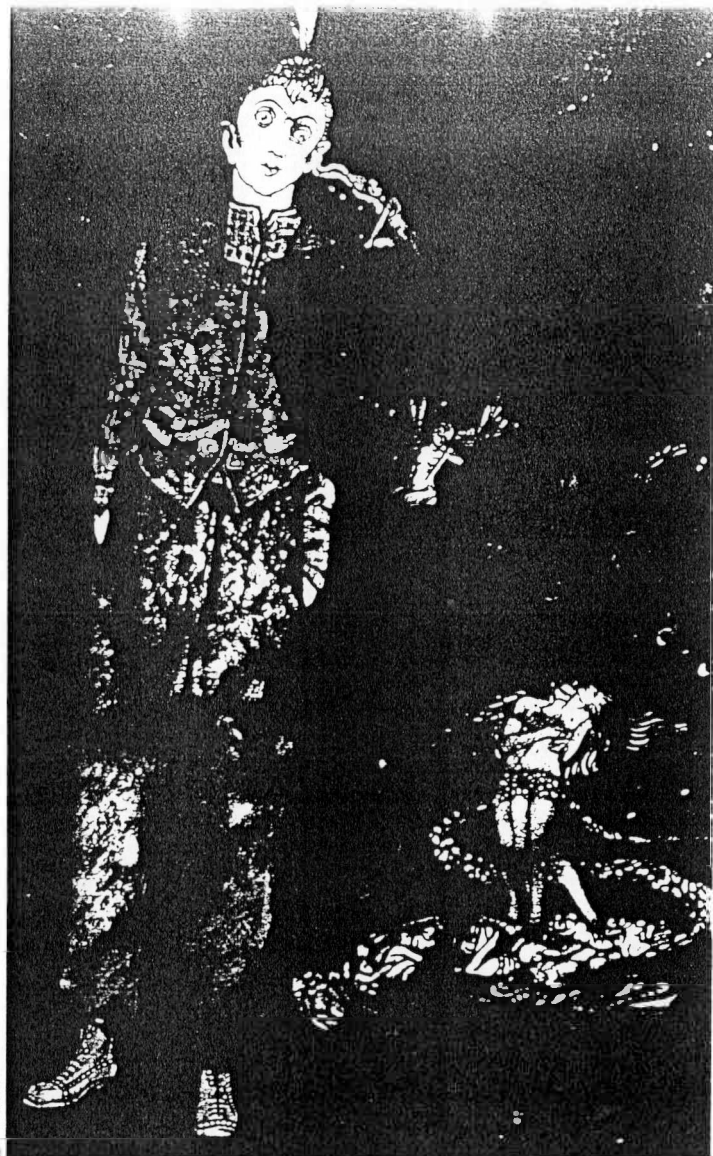


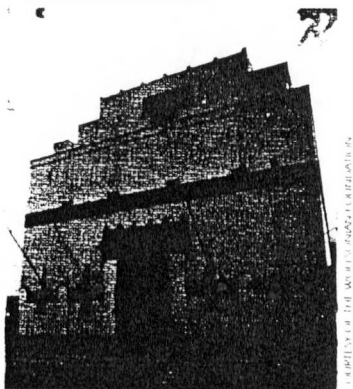
Figure 5: 'The Magic Glasses,' by George Fitzmaurice.

dispersion within the glass, actually staining the glass from a pale yellow to a rich rust color, depending on the amount of silver stain applied, the ability of the base glass to accept the stain and the temperature of the kiln.

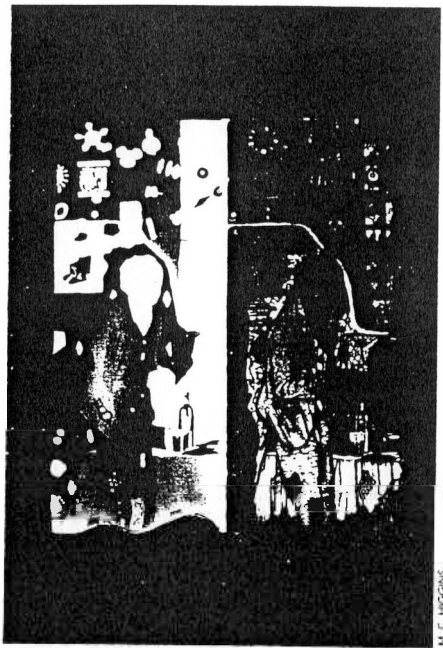
For Clarke, the silver stain meant he could add approximately three shades of yellow to clear areas, plus the mixture of the yellow with whatever his base color was, again increasing his palette. This ingenious use of techniques yielded him a very rich mixture of colors.

Vitreous paint is a mixture of a soft, ground glass flux and metallic oxides. After its application, the glass is fired in a kiln at approximately 1200° F, at which point the soft glass flux fuses to the heat-softened base glass, and holds the metallic oxides in place on the base glass. The vitreous paint was used to add the details and to regulate the amount of light coming through the glass. Clarke employed both a pen and a brush to apply the trace lines. He also used over-all mattes, frequently stippled with a stiff brush and worked with a needle. Clarke worked with the vitreous paint much as he did with pen and ink for his illustrations. His painting is very detailed, and by using the pen, he was able to get crisper lines without needing to cut back and straighten, as he would have to do had he used a brush.

Figure 6: The Wolfsonian Foundation Building, Miami Beach, Florida

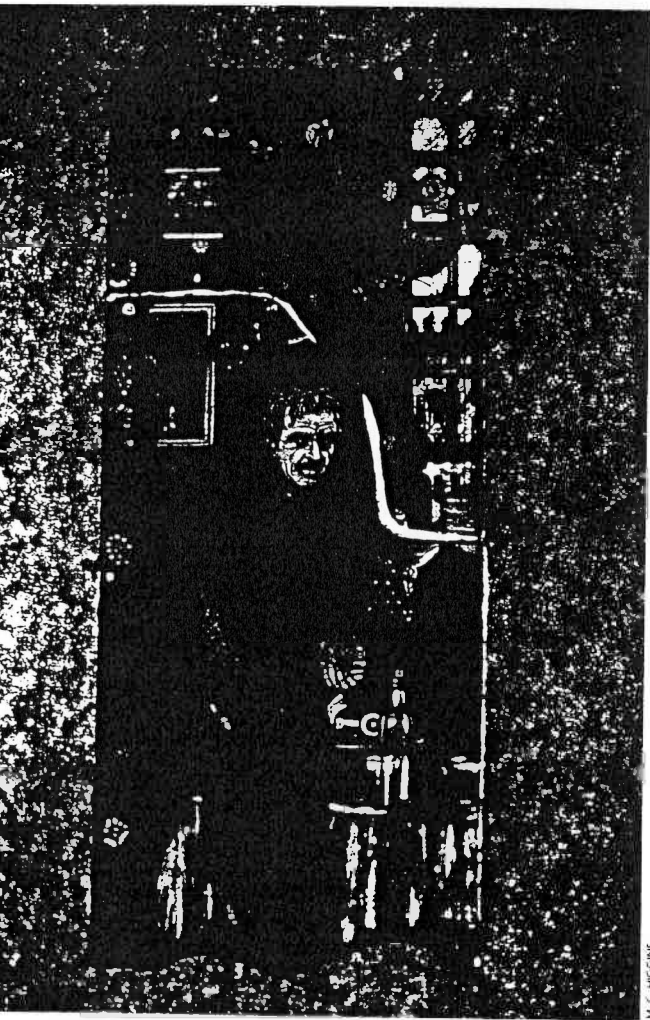






(left top) Figure 7: 'Juno and the Paycock,' by Sean O'Casey.  
The two layers of plating, side by side.

Figure 8: 'Juno and the Paycock,' by Sean O'Casey.  
The two layers of plating, stacked.



### Conservation

The most immediate conservation concern was the repair of any new breaks in the glass. With stained glass conservation, there is usually the additional concern of what to do with any previous repairs. The traditional method of repair has been either to cover a break with a lead flange or, more frequently, to insert an 'H' shaped lead came between the pieces of broken glass. This often entailed grozing, or removing some of the original glass to accommodate the thickness of the heart of the lead. Fortunately, none of the breaks in *The Geneva Window* had been grozed. Some cracks were new and had not been addressed, three cracks had been glued with what appeared to be a conservation quality epoxy, and two cracks had been covered at some point, after fabrication, with a lead flange.

There were also a number of original cover flanges on the panels. It was possible to distinguish original cover leads from later ones by their appearance. The originals were done in the same gauge lead as the rest of the panel, and their joints were soldered in the same manner as those on the rest of the lead network.

Glass which has been deeply acid etched and is then painted and fired at a high temperature in a kiln has numerous stresses in it which are sometimes resolved by the glass breaking, either in the kiln or at some later time. It was apparent that a number of pieces broke before the ensemble was finished, and rather than redo the many steps of production in areas where the breaks were not considered intrusive, Clarke decided to simply cover the breaks with flanges. At other times Clarke would redo pieces which had broken in the kiln.

All of the original flanges were left in place. The non-original flanges, however, were removed, because they had not been seen and accepted by Clarke and his assistants (*Figure 12*). Because of the internal stresses from the etching and firing, these pieces had sprung, meaning that they no longer lined up perfectly at the crack, leaving gaps between the two pieces which now had to be filled. This usually does not happen when the glass has been either painted or etched, but the combination of etching and then firing increases the stresses and causes the condition to occur.

Because the pieces were etched, the color fluctuated greatly across the length of the crack and the tinted fill material had to also jump from color to color, as necessary. In this case, the material had to fill, as well as hold, the glass together. HXTAL, a conservation quality epoxy, was used

*continued on page 24*

Figure 14. "On Music," by James Joyce. After initial gluing.

Figure 15. "On Music," by James Joyce. After infill and overpainting.



continued from page 22

for the fills and for any new breaks. It was chosen because it is water-white, has an acceptable match of the refractive index of the stained glass and has held up well in various aging studies of adhesives. The epoxy was then overpainted (Figure 15) with cold, or unfired paint, to match the original vitreous paint.

There was one hole in Panel #8, near the head of the minstrel (Figure 14), which had been filled in with an opaque brown material. This has now been replaced with a new fill consisting of a thin layer of purple, backed by a thicker layer of lightly tinted HXTAL, to match the flashed purple and tinted glass. The flashed fill was then overpainted to match the original paint (Figure 15).

Cleaning was one of the most important steps in the conservation treatment. Clarke's painting technique involved much intricate detailing. Working with a needle, he removed pin pricks of paint through which light would sparkle by abrasion. Over time, as these filled-in with a film of dirt and, in some places, with an original over-application of putty, the window's glittering appearance was greatly retarded.

When the glass was removed from its leads for gluing, it became apparent that both the glass and the lead were quite strong and that opening up all of the leads from the back for cleaning would be possible without endangering the glass or damaging the leads. Large drips of original solder were found resting against the glass under the leads; these contributed to some of the breaks in the glass by hold-

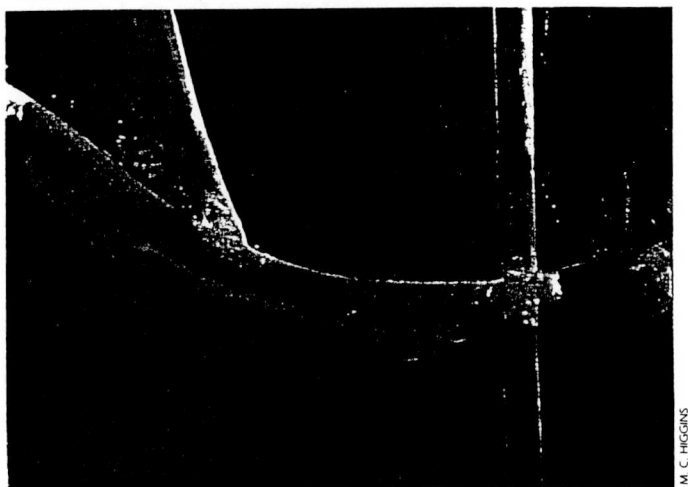
ing it back in one corner while the rest of the glass could move slightly. These solder drips were removed.

There was quite a lot of dirt adhering to the glass paint on the front surface and trapped between the two layers of glass. When the window was first constructed a linseed oil putty was used to seal the leads. Over time, the putty broke down, allowing dirt and soot to filter in between the layers. A fine film of dirt settled on the two interior glass surfaces, and cut down on the amount of light passing through the glass. Because stained glass is totally reliant on transmitted light, any diminishment of this light will lessen the work of art. As the putty continued to dry out, particles of the putty fell and were trapped between the layers of glass.

All the glass was removed from its leads and cleaned. In this case, because the paint was in excellent condition, the glass was washed using 'Orvus,' a synthetic detergent of Sodium Lauryl Sulfate, then thoroughly rinsed with distilled water. Some additional cleaning was done using scalpels and fiberglass brushes. Once back in the leads, the glass panes were again resealed. All putty oils were completely cleaned off the glass.

When the glass was cleaned, small amounts of wax from the original etching process were found, as well as one instance in Panel #1 in which the medium from the silver stain application had never been removed (Figure 16). Since it is a very simple matter to wash off this medium, it was seen as an indication, supported by accounts of the panel's fabri-

Figure 16: 'The Wayfarer,' by Patrick Pearse.  
The silver stain medium left on the glass.



cation, of the final rush to complete the ensemble. Analyzed in this light, the remaining medium was of historical interest and left in place on the glass.

The signature is partially covered by the leads. It reads: "Harry Clarke, Dublin 1930."

#### Conclusion

The sophistication and intricacy of Harry Clarke's stained glass art demand the utmost from the conservator. In order to do simple justice to the panel, the conservator must be conversant in a wide variety of fabrication and conservation techniques, yet must be able to meet the challenges presented with a minimum of ego. In the end, the spirit of the original work of art must be preserved and conveyed to a whole new generation of art lovers and scholars.

*The Geneva Window* was the last commission Harry Clarke saw completed, and it is certainly one of his masterpieces. The Irish government and powerful religious leaders had banned some of the authors and works represented, most of whom were well respected internationally. The authorities then rejected the visual interpretation of that work, a second act of censorship. Clarke certainly could have expected this, yet he nevertheless proceeded to challenge Ireland's official parochialism. *The Geneva Window* is the work of a mature artist, accomplished in his technique and sure of his vision. In pushing the limits of his craft, as well as the limits of his society's cultural mores, he left us an invaluable legacy and example in his window for the League of Nations. Ω

#### References

- Bodkin, Thomas. "The Art of Mr. Harry Clarke." *The International Studio*, December 1919, p.45-50.
- Brinnin, John Malcolm. "Mitchell Wolfson, Jr.: The Man and His Mission." *The Journal of Decorative and Propaganda Arts*, Fall 1988, p.80-93.
- Checkland, Sarah Jane. "'Reject' up for sale—at more than £100,000." *The London Times*, May 2, 1988, p.146.
- Fallon, Brian. "Geneva Window goes to America." *The Irish Times*, May 24, 1988, p.12.
- Gordon Bowe, Nicola. *The Life and Work of Harry Clarke*. Dublin: Irish Academic Press, 1989.
- Harry Clarke. Dublin: Douglas Hyde Gallery, Trinity College, 1979. (Monograph by Nicola Gordon Bowe, with a chronology and catalogue)
- The Stained Glass of Harry Clarke, 1889-1931*. London: The Fine Art Society, 1988. (Exhibition catalogue)

MARY CLERKIN HIGGINS, a conservator in private practice in New York City, has worked in stained glass for 17 years. Among her clients are: The Metropolitan Museum of Art, The Cloisters Collection, The Detroit Institute of Arts and The Nelson-Atkins Museum of Art. She conserved *The Geneva Window* for the Wolfsonian Foundation in 1992.

## APPENDIX 3

### Books on Glass

- Glasmalerei Des 19. Jahrhunderts in Deutschland  
'Katalog zur Ausstellung Angermuseum Erfurt'  
23. September 1993 Bis 27. Februar 1994  
Edition Leipzig 1993
- Banham, J. and Harris, J eds. *William Morris and the Middle Ages: a collection of essays*, together with a catalogue of works exhibited at the Whitworth Art Gallery, 28 September - 8 December 1984. Manchester University Press, 1984.  
Oxford Road Manchester M13 9PL
- Reed, Cleota, ed. *Henry Keck Stained Glass Studio 1913-1974*, Syracuse University Press, 1985.  
1600 Jamesville Avenue Syracuse NY 13210
- Bowe, NG, Caron, D and Wynne M *Gazetter of Irish Stained Glass*, Irish Academic Press, 1988  
Dr Nicola Gordon Bowe Parsley Cottage 11 Ashfield Avenue  
Ranelagh Dublin 6 Ireland. 97 5822.
- Hayward, J & Cahn, W *Radiance and Reflection: Medieval art from the Raymond Pitcairn collection*, The Metropolitan Museum of Art, New York, 1982
- Lymant, B *Die Glasmalereien des Schnutgen-Museums*, Koln, 1982.
- Perrot, Françoise *Le Vitrail Français Contemporain*, Centre International du Vitrail, Chartres, Le Manufacture, 1984.  
Le Manufacture 13, Rue de la Bombarde, 69005 Lyon
- Duncan, A Eidelberg, M Harris N *Masterworks of Louis Comfort Tiffany*, Harry N Abrams, Inc., Publishers, New York, Thames & Hudson London, 1989.  
ISBN 0-8109-1537-5
- El Vitral Modernista: Abril - Maig 1984*, Fundacio Joan Miro Centre d'Estudis d'Art Contemporani, Parc de Montjuic - Barcelona 4.
- Crewe Sarah *Stained Glass in England c.1180-c.1540*, Royal Commission on the Historical Monuments of England, Her Majesty's Stationery Office, 1987.
- Kelso, Doris *Blessings in Stained Glass: Memorial Windows of First Presbyterian Church Florence, Alabama*, Peronna Publishing, 1993.  
First Presbyterian Church 224 East Mobile Street Florence Alabama. (205) 764-2081

Good example for churches to follow when preparing a resume of their windows, or for students to follow for church presentations. Contents run as follows: Location map of windows; Church- the building, the windows. Biographical sketches (of donors); Stained Glass (explanation of techniques used in this church); the Ages and Artists of the Windows; Technical Analysis (of Windows by VR, Director of CoSGIA); Symbols Explanations & Illustrations; Christian Symbols (explanations as they pertain to texts and pictorial nature of window); Research Resources (Books, Church Records, Newspapers, Journals, Private Papers and Documents).

Light of the World. Robert D Martin Window #4 on plan. Memorial to his parents Mary Mitchell Martin (1845-1915) and Robert Dean Martin (1842-1910). Benign example of the Holman Hunt. Post-opalescent stained glass style. Sharp contrast of red and blue which architects at that time felt were the hallmarks of 13th C stained glass as exemplified by Chartres and others. Strong possibility from Payne-Spiers Studio of New Jersey (VR p.23). Borders of deep blues interspersed with white, yellow, or light blue and pine squares.

- Jaszai, Geza *Mittelalterliche Glasmalereien*, Bildhefte des Westfälischen Landesmuseum für Kunst und Kulturgeschichte Münster, Nr. 24, 1986.  
ISBN 3-88789-073-6

*VITREA: Vitrail, verre, architecture*, Revue du Centre International du Vitrail, No 5/6-ANNEE 1990. 80 FF.  
ISSN 0991-0131  
5, rue du Cardinal Pie  
F - 28000 CHARTRES Tel: 37 21 65 72

*The Stained Glass Windows of Saint Joseph*, Albrecht Art Museum, Saint Joseph, Missouri, 1976

Sturm, James      *Stained Glass from Medieval Times to the Present: Treasures to be seen in New York*, EP Dutton Inc., 2 Park Avenue, New York, NY 10016, 1982.  
ISBN: 0-525-20935-2  
ISBN: 0-525-47627-X (DP)

*Contraltums: vitralls de l'exemple*, Exposició del 20 d'Abril al 31 de Maig de 1983, Casa Elizalde, Valencia, 302.

*Die Glasfenster der Maria-Hilf-Kirche in München-Au 1834-1844 in zeitgenössischen kolonierten Lithographien*, Clemens-Sels-Museum Neuss, 8.11.81  
bis 14.2.82

*Jacques Gruber (1871-1936): Ebeniste et maître-verrier*, Ministère de la Culture, Musée Horta, Bruxelles (Saint-Gilles)

Wilson, H Weber      *Great Glass in American Architecture: decorative windows and doors before 1920*, EP Dutton, New York, 1986  
ISBN: 0-525-24318-6  
ISBN: 0-525-48176-1 9DP0

Stravridi, Margaret      *Master of Glass: Charles Eamer Kempe 1837-1907*, John Taylor Book Ventures for the Kempe Society, , 1988.  
JTBV 7 Cranbourne Road Hatfield AL10 8AW  
The Kempe Society 41 York Avenue Crosby Liverpool L23 5RN  
Distributed by Spa Books Ltd PO Box 47 Stevenage Herts SG2 8UH  
ISBN 1 871224 00 4

Duncan, George Sang      *Bibliography of Glass*, Dawson's of Pall Mall for the Society of Glass Technology, Sheffield, 1960  
Difficult to use but highly comprehensive guide to pre-1940 sources.

Caviness, Madeline Harrison      *Stained Glass before 1540: an annotated bibliography*, Reference Publication in Art History, GK Hall & Co, 1983.  
GK Hall & Co. 70 Lincoln Street, Massachusetts.  
ISBN 0-8161-8332-5

Holiday, Henry      *Stained Glass as Art*, Macmillan & Co Ltd, New York, 1896.

Webster, Jane, James Denison Pender and Simon Whistler      *Engraved Glass*, Asprey, London, 1990(?).  
Asprey, 165/169 New Bond Street, London, W1.

Whistler, Laurence      *Images on Glass*, John Murray in association with Cupid Press, London, 1975.

Reyntiens, Patrick *The Beauty of Stained Glass*, The Herbert Press, London.  
[Bullfinch Press (Little Brown & Company Inc. North American edition.)]  
The Herbert Press 46 Northchurch Road London N1 4EJ  
ISBN 0-8212-1811-5

Armitage, E Liddall      *Stained Glass: History, Technology and Practice*, Charles T Branford Company, Massachusetts, 1959.  
Charles T Branford Company Newton 59 Massachusetts.

- Melhuish, Nigel (ed) *Church Building* Published quarterly by Gabriel Communications Ltd, FREEPOST, First Floor, St James's Buildings, Oxford Street, Manchester M1 8DS. Tel: 061 236 8856 Fax: 061 236 8530  
Subscription rates: Airmail outside Europe £24 UK.  
An excellent periodical which outlines restoration projects and new architectural developments, design and maintenance. Good list of suppliers and craftspeople.
- Waern, Cecilia *John La Farge: Artist and Writer*, Seeley and Co Limited, London 1896. [Macmillan & Co, New York]  
Interesting monograph of the artist with photographs of Harvard Memorial Hall window. Written in an amateur style but shows some insights into the times.
- Report by the City Churches Commission to the Bishop of London, The Diocese of London, January 1994.  
Price for the Summary of recommendations: £2.00 UK.  
Known as the Templeman Commission Report, after the Chairman, it makes recommendations for the closures and re-organisation of the London Diocese. There are less than 5000 people in the inner London area with 36 churches to serve their needs, many of which have a regular congregation of less than 25. There is no compulsion by the Bishop of London to accept the recommendations for closure, but the need for some recycling of churches is well understood and likely.
- Donnelly, Michael *Glasgow Stained Glass: a preliminary study*, Glasgow Museums and Art Galleries.  
ISBN 0 902752 12X  
Reprinted 1985 by Smith Brothers (Kilmarnock) Ltd.  
This small book is a good source of information on Scottish artists who have had an enormous influence on Australian glass and is particularly useful as it gives details of Daniel Cottier's early life.
- Victorian and Edwardian Stained Glass: the work of five London studios 1855-1910*, English Heritage, Historic Buildings & Monuments Commission for England, 1987.
- Larkworthy, Peter *Clayton and Bell: stained glass artists and decorators*, 1984.
- Gerson, Paula Lieber (ed) *Abbot Suger and St Denis: A Symposium*, Metropolitan Museum of Art, New York, distributed by Harry N Abrams Inc., New York, 1986.  
ISBN 0-87099-408-5 \$US35.00
- Parker, Elizabeth C. *The Cloisters: Studies in Honor of the 50th Anniversary*, Metropolitan Museum of Art, New York in association with the International Center of Medieval Art, 1992.  
ISBN 0-87099-635-5 \$US55.00
- Marks, Richard *Stained Glass in England during the Middle Ages*, University of Toronto, 1993.  
English edition: Routledge 11 Fetter Lane, London. EC4P 4EE  
ISBN 0-8020-0592-6 \$US85.00
- Williams, Jane Welsh *Bread, Wine and Money: the windows of the trades at Chartres Cathedral*, University of Chicago Press, 1993.  
ISBN 0-226-89912-8 (cloth) ISBN 0-89913-6 (paper)
- Twining EW *The Art and Craft of Stained Glass* Sir Isaac Pitman & Sons Ltd  
London 1928.  
Occasionally can be found in S/H bookshops and would be a worthwhile addition to any library for its thorough treatment of technique and process, even though somewhat outdated in art historical terms.

APPENDIX 4

Head of Conservation  
Jonathan Ashley-Smith

RCA/V&A Course  
Alan Cummings

Science  
Graham Martin  
Josephine Darrah  
Boris Pretzel  
David Ford

Secretary  
Dottie Rogers

Documentation  
Lea Jones  
Administration  
Ian Shaw  
Erica Grohmann

Books	Ceramics	Furniture	Metals	Paper	Paintings	Sculpture	Stained Glass	Textiles
Adrian Pasotti	Victoria Oakley	John Kitchin	Diana Heath	John Wagstaff	Peter Young	Richard Cook	Agnes Holden	Lynda Hillyer
Helen Shenton	Fi Jordan Wendy Walker	John Bornhoft Malcolm Green Tim Miller Enio Panetta Nick Umney	Kenneth Turner Leesa Vere-Stevens	Pauline Webber Merryl Huxtable Elizabeth Martin Alison Richmond Alan Derbyshire	Jim Murrell Susannah Edmunds Lucia Scalis	Charlotte Hubbard Alexandra Kosinova	Sam Whitney	Marion Kite Val Blyth Albertna Cogram Nicola Gentle Gill Owens Sarah White Anne Amos
Jane Rutherfordston Annette Low	Edward Then	Guy Dunhill	Betty Smith	Barry Danby Lynette Crowhurst Nicki Edwards Smith Danny Norman		Shan Tomlin		Audrey Hill
				Carol Barker Nick Hindhaugh				Kate Stockwell
				Samuel Mizrachi	Bernard Pappe Martin Dvorak	Marie-Therese Weech		Kathleen Mathieu Maya Schwery
	Lorna Barnes	Albert Neher Stephen Sheasby	Stephen Newman	Megan Gent Phillippa Mapes Jacqui Rees Mark Sandiford	Janel Gilbert	Sarah Boulter	Drew Anderson	Diana Drummond Derek Balfour Jenny Potter



Royal College of Art  
Victoria & Albert Museum  
Joint Course  
Conservation

APPENDIX 5

# **Opportunities for Training and Research in Conservation 1994/95**

**MA  
Stained Glass  
Conservation**

**MA  
Conservation Science:  
Identification of  
Materials**

**MPhil  
Computers  
in Conservation**

**MPhil  
Optical Techniques  
in Conservation**





## The Options

The RCA/V&A Conservation Course offers a range of specialised practical conservation and research opportunities each year. The options available depend on the availability of staff, facilities and resources within the Conservation Department of the V&A Museum. These options change from year to year and those for a particular year can not be resolved by the copy date for the College prospectus. The following notes are therefore essential to anyone interested in Conservation alongside the Course entry in the 1994/95 Prospectus.

## 1994/95

During 1994 and 1995, the Conservation Department at the V&A Museum is being relocated in new and purpose-built studios in the building behind the Henry Cole Building which used to house various departments of the Royal College of Art. The disruption caused by these moves, together with the commitment to existing students, will place considerable demands on conservation staff and facilities. Unfortunately, this situation severely limits our ability to offer places for the academic year beginning in October 1994. The options outlined below therefore do not include such core disciplines as Textiles, Ceramics & Glass, Metals and Sculpture.

Space has been set aside for students and interns in the the new conservation facilities, so once the move has been completed, we will be able to offer the full range of disciplines including some, such as Books Conservation, which have been impossible to date for lack of space.

We would like to apologise to candidates who were hoping to apply to join the Course in October 1994 and who find their proposed discipline absent from the list. We hope your interest will survive until the following year. In the intervening period, it is often possible to arrange visits and short meetings to the Department to meet potential supervisors and discuss your particular needs. Please contact us if this would be helpful.

## Contacts

For a copy of the current College Prospectus and application forms, contact:

The Registrar  
Royal College of Art  
Kensington Gore  
London SW7 2EU  
Tel 071 584 5020  
Fax 071 225 1487

For a Course Brochure and more detailed information on any of the options, contact:

Helen Jones  
RCA/V&A Conservation Course  
Tutor Victoria & Albert Museum  
London SW7 2RL  
Tel 071 938 8648  
Fax 071 938 8661

## Studio-based MA

Studio-based MA's offer students the opportunity to train as practising conservators in a specialised area at postgraduate level. Most Courses may be 2 or 3 years full-time according to previous training or experience. Students are based 60 - 70% of their time in the relevant Section of the V&A Museum Conservation Department, engaged in practical and preventive conservation work, technical study and documentation of objects from the Museum collections. Work-experience outside the Museum is also encouraged at appropriate points in the Course. Supervision and tuition in the studio or laboratory are generally the responsibility of the Head of Section or a Senior Conservator within the relevant Section.

30 - 40% of the Course is devoted to an intensive and demanding programme of academic work and research. There are formal seminars and courses, especially in the first year, but also much emphasis on tutorials and self-motivated study. Assessment is based on essays, seminar presentations, research project reports and all-round performance in the studio or laboratory.

Only one studio-based MA option is available for the academic year beginning October 1994:

### • STAINED GLASS

The ideal candidate will have experience in stained glass conservation or in working with glass. However, as the opportunities to acquire such experience at degree or diploma level are few and far between, established skills are not essential. The candidate must nonetheless understand the highly specialised nature of the discipline and demonstrate a strong interest in the stained glass medium. Experience in other aspects of conservation, general craft skills, scientific and historical knowledge are an advantage. A preliminary visit to the stained glass studios of the V&A is strongly recommended

## Laboratory-based MA

Besides offering opportunities for students to train as practising conservators, the Course offers occasional options in conservation science. In these cases the successful student will be based in the laboratories of the Science Section of the Conservation Department and supervision will be provided by a Senior Scientist. The general arrangements for Conservation Science students, the balance between practical and academic work and the methods of assessment will be as for studio-based students.

For the academic year beginning October 1994/95, the following laboratory-based option is available.

### • CONSERVATION SCIENCE: IDENTIFICATION OF MATERIALS

One important aspect of the work of the V&A Conservation Department Science Group is the technical examination and scientific analysis of museum objects. The information which is obtained from such work is vital to the conservator since without a proper understanding of how and of what an object has been made, it is impossible to decide on the right approach to conservation. The curator also often relies on the scientist's work since the construction and composition of an object can resolve questions of date, origin and attribution.

A place is available for a student to train as a conservation scientist specialising in the identification of art and design materials. The student will be involved in the application of a wide range of microscopic techniques and instrumental methods of analysis. The materials to be studied are as diverse as the collections of the V&A Museum. They include textiles, wood, stone, ceramics, glass, metals, pigments and a variety of organic materials used in the making of objects from many different cultures over many centuries.

This studentship represents a unique opportunity to train with a senior scientist who has had primary

responsibility for microscopy and analysis at the V&A for over twenty years and who is due to retire in four years. The Materials Department of Imperial College of Science, Technology & Medicine is also formally involved. The collaboration with ICSTM offers access to some of the greatest expertise and the most sophisticated analytical facilities in the UK.

The ideal candidate will have a good honours degree in a relevant science and a strong interest in the properties and composition of materials. Other criteria for selection will be experience in microscopic techniques and/or instrumental methods of analysis and a serious interest in the arts from both a historical and practical point of view. A mixed arts/sciences education would be useful.

## Research MPhil

As well as the studio- and laboratory-based MA options, the Course offers a number of research places each year. Areas of research which are of particular current interest to the Course are indicated in the options listed below. We are happy, however, to consider individual proposals providing the subject areas involved are relevant to the V&A collections.

Candidates applying for MPhil options must provide with their application a short research proposal. This should explain the value of their intended work and make it clear that they are aware of work already done in their proposed field of investigation. It should also indicate the degree of access to objects required, the nature of supervision needed and other resource implications. While it is understood that the character and direction of research may change as it progresses, candidates will initially be examined on the academic quality of their proposal and the feasibility of the project within the resources available to the Course.

The period of research for MPhil is 2 years full-time. In some circumstances a part-time arrangement may be possible and MPhil students may be able to convert to PhD.

All MPhil students take a course in Research Methods and attend research seminars at the College. The Course programme of seminars and visits is open to research students but there is no core curriculum and students are expected to work with considerable independence and self-motivation. Assessment is based primarily on the final research thesis.

### • THE APPLICATION OF COMPUTERS IN CONSERVATION

The project will provide an opportunity for a student to study and develop the applications of computers in conservation. Areas of interest include:

- Documentation procedures and data-base systems for large museum collections.
- Image processing, 3D modelling, use of scanners, still cameras etc. as applicable to the study and documentation of museum objects
- Sophisticated text/2D and 3D image data base systems for smaller collections of objects.
- Expert systems for object condition assessment by conservators and non-conservators.
- The use of computers in interactive teaching for conservators - especially science for non-scientists.
- Multi-media presentations of technical and conservation data for use in gallery and exhibition space.

During the first year, the successful candidate will be based partly in the Conservation Dept. of the V&A and partly in Computing at the RCA. This will permit familiarisation with the needs and interests of museum documentation experts, conservators, curators and collections managers and how these can be served by the IBM compatible Museum systems and the Mac environment of the College. The division of time will depend on the interests of the individual student and the availability of appropriate tuition/supervision. During the second year, the student will undertake a full-time computing or documentation project of particular interest within one of the areas outlined above.

The opportunity would suit a conservation graduate or a design graduate with a strong interest in computers or a computing graduate with an interest in museums and the technical study of works of art.

### • THE APPLICATION OF OPTICAL TECHNIQUES TO THE EXAMINATION OF WORKS OF ART AND TO THE STUDY OF THEIR DIMENSIONAL RESPONSE TO THE ENVIRONMENT

The project would draw on the resources of the V&A Conservation Department and the Photography, Holography and Computing Departments of the Royal College of Art. There are additional possibilities for collaboration with Linhof, Zeiss, the National Gallery, the Tate Gallery, Imperial College of Science, Technology and Medicine and others. The techniques involved may include photogrammetry, holographic interferometry and other methods of three-dimensional recording as applied to paintings, sculpture and other works of art and design. There may also be productive overlap between this project and the project on the applications of computers in conservation - particularly in the areas of 3-dimensional modelling and display.

After an initial period of contextual study, the student would be expected to focus his/her research on a single technique and to the study of a limited range of objects/environmental parameters. The particular area of investigation chosen will depend on the inclinations of the student, the availability of supervision, facilities and resources. The project could have major implications for the recording, replication, care, packing, transport and exhibition of works of art and museum collections.

The ideal student would be a graduate from natural sciences or engineering with a strong interest in optics and the arts. An MSc Optics graduate wishing to proceed to PhD, or a conservation graduate with a science background and a particular interest in this field would also be suitable.





Royal College of Art  
Victoria & Albert Museum  
Joint Course  
**Conservation**

# STOP PRESS

## MA/MPhil in Conservation of Architectural Interiors

Discussions are taking place at present which may make an extra MA or MPhil option available for the academic year beginning October 1994. The aim will be to provide a research opportunity or education, training and work-experience for a student who wishes to make a career in the area of conservation concerned with historic architectural interiors. This is a very broad subject area. The range of activities involved in a two or three year course might vary considerably depending on the availability of suitable projects and supervision, and on the needs and ambitions of the individual student. Central to the course would be the involvement of the student in major projects in historic houses and monuments. Historic paint analysis would also be an important element. With these in mind, we are seeking the support of the National Trust, English Heritage and others. No firm commitment to this option can be made sooner than the end of January. If you are interested, please do not make a formal application but contact us for up to date information on 071 938 8648.

## Do you need to know more about the RCA/V&A Conservation Course?

*We always prefer to answer enquiries in person and welcome telephone enquiries. We can also make appointments for intending applicants to visit the College and/or Museum to talk to staff and see the facilities available. However, we are kept very busy with current students and understand it can be frustrating trying to reach us. If you cannot get through, there is at least a variety of literature available which we hope will answer most of your questions about the RCA/V&A Conservation Course. Some provides information about the College, some about course content, organisation and assessment procedures, some about application procedures, some about the students and their work and some about individual disciplines. We have enclosed what we have considered appropriate to your recent enquiry. Please contact us again if you need more information.*

### •Addresses and numbers

Royal College of Art, Kensington Gore, London SW7 2EU. Tel. 071 584 5020. Fax 071 225 1487.

College Registry: Assistant Registrar (Admissions), Valerie Lyons, ex. 423

Conservation Course Secretary: Barbara Berry, ex. 323

Conservation Course Leader: Alan Cummings, ex. 389

Conservation Course Tutor: Helen Jones, RCA/V&A Conservation Course Rooms, Victoria & Albert Museum, London SW7 2RL. Tel. 071 938 8648.

### •Literature

<b>Royal College of Art Prospectus</b>	Available on request directly from the College Registry or via the Course Secretary. Includes general information about the College and all its courses, bursaries and fees, application procedures etc. Available all year round unless out of print.
<b>Application forms</b>	Available between November and January directly from the College Registry. Deadline for applications is 11 February 1994 and the Registrar is reluctant to issue forms after the deadline except by arrangement with Course staff. If you are applying late, contact the Course Secretary in the first instance. N.B. Only the completed form is required at the first stage of application for the Conservation Course. Do not submit a portfolio until you have been invited to interview.
<b>Current list of options</b>	Available from the Course Leader or Course Tutor from November each year. Provides a list of specialist practical conservation disciplines and research options offered by the Conservation Course for the forthcoming academic year. A short note on requirements, special arrangements etc is provided for each option. This is essential information for intending applicants.
<b>Lists of options from previous years</b>	Available from the Course Leader or Course Tutor all year round. For information only. Some options continue from one year to the next, so these lists can be useful.

<b>Conservation Course Brochure</b>	Available from the Course Leader or Course Tutor all year round. A booklet which provides a little more information about the Course than we can include in the Prospectus. The best starting point if you know nothing about the Course.
<b>Faculty of Humanities 1993 Degree Show Brochure</b>	Available from the Course Leader or Course Tutor all year round. A booklet prepared for graduating students of the Faculty as a whole, which includes short accounts by Conservation students of their experience and achievements during the Course.  <i>(Out of print; photocopies of entries for relevant disciplines can be supplied.)</i>
<b>Course Outlines</b>	Available from the Course Leader or Course Tutor - only to seriously intending applicants for specific options. For some practical disciplines and research options, rough "maps" have been prepared which show how a student's time is organised over two or three years.
<b>Specialist Syllabi (Practical &amp; Academic)</b>	Available from the Course Leader or Course Tutor - only to seriously intending applicants for specific options. For some practical disciplines, guide syllabi have been prepared by members of the V&A Conservation Department who supervise studio-based students. These are not lists to be rigorously followed but they indicate broadly the range of skills and subject areas a student conservator might cover as a specialist
<b>General Academic Syllabus</b>	Available from the Course Leader or Course Tutor to intending applicants. During the first year of their course, Conservation students are offered a wide range of seminars and short courses which are organised on an annual basis. This document outlines these areas of formal teaching, the bias of which is towards materials science. In subsequent years, seminars, visits and other activities are arranged for the most part to meet the needs of individual students and no formal syllabus is possible.
<b>Article from V&amp;A Conservation Journal No. 1*: <i>Coming of Age</i></b>	Available from the Course Leader or Course Tutor. An article describing the first two years of the Course - developments, advantages and disadvantages of the College/Museum collaboration, future plans etc. Includes profiles of students who started the Course in 1989, 1990 and 1991.
<b>Article from V&amp;A Conservation Journal No. 3*: <i>Assessment on the RCA/V&amp;A Conservation Course: Essays, Proposals and Projects</i></b>	Available from the Course Leader or Course Tutor. An article discussing some of the methods of assessment for students and the range of written work produced by the Course as a consequence. Abstracts of a selection of the first essays and research projects are provided.
<b>Article from V&amp;A Conservation Journal No. 5*: <i>New students for the Academic Year 1992/93</i></b>	Available from the Course Leader or Course Tutor. Short profiles of students starting the Course in October 1992, noting their previous education and relevant work experience.

<p><b>Article from V&amp;A Conservation Journal No. 6*:</b>  <i>Assessment on the RCA/V&amp;A Conservation Course: Science for Conservators</i></p>	<p>Available from the Course Leader or Course Tutor. An article discussing the varying levels of scientific education of students joining the Course and the need for flexibility in assessment. Abstracts of essays on scientific subjects by students with previous science or conservation training are provided.</p>
<p><b>Article from V&amp;A Conservation Journal No. 7*:</b>  <i>The Art of Natural Selection</i></p>	<p>Available from the Course Leader or Course Tutor. An article discussing the way students are selected for the Course from the first enquiry to the formal interview.</p>

\* If a copy of the Journal itself is available, you will receive one automatically or on request. Where the issue is out of print, a photocopy can be supplied.

## APPENDIX 6

### BOURGES CONFERENCE

#### DAY 1

The first paper was delivered by Elisabeth Jagers from Cologne. She outlined a problem which we all experience, namely the specific make-up of glass being widely variable which makes conservation complex.

She further named the main areas for preliminary consideration and debate when contemplating a conservation programme:-

#### 1. Composition

- Methods of fabrication
- Situation
- History in-situ
- Climactic influence
- Biological influence

#### 2. Levels of Intervention

- Investigation and documentation
- Cleaning
- Paint Consolidation
- Conservation of lead
- Protective glazing

#### 3. Systems of Analysis

- Analysis of corrosion and possible causes.
- Catalogue possible measures.

This leads to a synthesis of approach to the Conservation Scheme.

The next part of the Paper dealt with levels of cleaning and the questions which should be asked:-

1. Is there a superficial layer which can be cleaned with a fibre glass brush?
2. Should paint be fixed before cleaning?
3. Is careful cleaning with scalpel justified?
4. What zones of corrosion are present? - e.g. at Erfurt, Germany.
  - Corrosion
  - "Altered Zone"
  - Main body of glass



5. What alternatives are there to physical methods?

- Laser (not proven)
- Chemicals E.D.T.A. (can be damaging)

#### SUMMARY

This was a thorough presentation of the questions and considerations which are responsible when planning a programme of Conservation.

It was revealing, though, that when asked what decisions had been made after the long term discussions at ERFURT that she had to admit that no decisions had been made.

#### PAPER 2

This was a most interesting paper by two of the most respected people involved in glass conservation in France, Professor Bettembourg of the Monuments Historiques in Paris and Michael Petit a Maitre Verrier.

The area for discussion was the cementing of stained glass and the properties of traditional cement as opposed to modern alternatives.

The test devised was a wind and moisture test set-up involving 20/25 mph wind force and high levels of driven moisture.

The materials tested were:-

1. Traditional stained glass cement.
2. Silicon Mastic
3. Acrylic Mastic
4. Butyl Rubber Mastic

The results were illuminating, the traditional stained glass cement having fared best, closely followed by butyl mastic glazing compound. The acrylic and silicon tests were disappointing, the acrylic disintegrating gradually and being carried away by the water and the silicon failing to give a weatherproof seal and becoming unfixed from the lead came, allowing buckling of the panel. Professor Bettembourg then went on to praise the work carried out in England by Chapel Studio and other Conservators who take great pains to hand-putty conserved glass with butyl mastic puttty.

His point in this was to highlight the French practice of cementing in the normal way after conservation which

involves covering the surface with cement and brushing the compound into the leads with bristle brushes. This he felt was not a logical thing to do and he further urged all Conservators towards the use of traditional cement but to consider other methods of application. He has been trying to apply cement by syringe and his experiments in this field continue.

#### NOTE

As well as a shortage of material due to inadequate translation being provided, there are no notes concerning several papers here. The papers concerning areas such as experiments with glass painting materials, analysis of back-plated glass, the usage of chemical cleaning agents such as E.D.T.A., did not have much new information to offer. It is apparent that there is, in France, a "circuit" of Conferences to which certain parties feel obliged to contribute. Widely experienced craftsmen do not need to be told, for instance, that a 40% addition of gum arabic to glass paint will cause crizzling and separation when fired - our apprentice here knows that.

#### PROFESSOR MAX SCHVOERER

He presented an interesting paper on the corrosion of lead comes. He highlighted the fact that the lead is protected by the actual presence of water as a surface layer (which is an interesting parallel to the glass itself). It is, rather, the relative humidity and swings of temperature which have important effects on corrosion.

The layer of lead carbonate usually formed is protective against humidity and atmospheric pollutants, being insoluble.

The main problems from the atmosphere are from acetic and sulphuric acid. There may be a problem caused by localised impurities in the lead which may corrode. This stems from the original smelting.

#### CHANTAL BOUCHON

She stressed the importance of conserving archive material from stained glass ateliers. The information about previous restoration programmes can be most important to us. She went on to describe the importance of proper storage for such archives and paper conservation etc.. She was also concerned that it was difficult to place such material in France, there being no single body charged with its care.

#### JEAN MAURET

A stained glass Conservator from Bourges, he stressed the spiritual importance in his personal philosophy and declared his belief that there was a strong creative element in Conservation. The light, the message, the

architectural role of the glass, were all important.

Not surprisingly, the Swiss contingent rose to lock horns with M. Mauret as was his obvious intention.

"The Conservator is the servant of the glass" was their position and there was clearly not one iota of common ground which was both disturbing and disappointing.

#### T. JUTTE

From Amsterdam, he outlined an enlightened and exemplary approach to the problems of the stained glass Conservator.

He outlined the vulnerability of the glass - by moisture leaching out alkaline elements and metallic compounds leaving the glass prone to attack from pollutants in the air, the need for protective climactic conditions within the edifice, and protective glazing without.

He stated his opinion that it is wrong to remove glass to Museums as an alternative.

He has reached certain conclusions regarding the use of external or isothermal glazing systems which he outlined. He further stated his intention to publish a definitive paper on the subject in 1994.

#### CONCLUSIONS

1. The external protective glazing will be in the range from 5 to 10 cms. (following experimental installations).  
  
Below 5 cms. air stalls and the interspace retains humidity, Over 10 cms. the "chimney effect" does not function.
2. The sides of the installation should be sealed as far as practicable.
3. Traceries function best when totally open to air on all sides.
4. Leaded exterior glazing will allow moisture to enter the interspace in time.
5. Climactic monitoring should continue for one year following installation to allow fine tuning.
6. A plus point for the Church is that temperature is more even so monuments etc., gain a degree of protection.

7. The fine tuning of a system may involve manipulation of the general ventilation/level of heating in the Church for optimum results.
8. External vented systems are generally inferior.

Stephen Clare



## APPENDIX 7

### THE CENSUS OF STAINED GLASS WINDOWS IN AMERICA Inc.

The Census of Stained Glass Windows in America is a not-for-profit organization founded in 1979 to establish a record, both historical and pictorial, of architectural stained glass in the United States from the time of its first appearance. Windows of both American and European manufacture are included. The goal of the Census is to collect and disseminate artistic, historical, and technical information that will serve as a basis for study of this form of architectural embellishment. Windows frequently contain more specific references to the society that produced them than any other aspect of a building. Donors are noted in inscriptions, preferences for one kind of artistic style over another evident through the choice of studio, attitudes towards religion displayed by the type of imagery (or lack of it), and the wealth and social status of the patron conveyed by the lavishness of the commission. Serious study of all of these questions is contingent on locating and identifying these highly visible, but little understood aspects of our national heritage. To these ends the CSGA brings together experts from many different fields: specialists in the field of stained glass, architectural historians, art historians, museum professionals, and preservation experts.

The Census can provide a trained specialist to work with organizations and to help prepare interns and volunteers from the locality. The CSGA is an educational resource ready to lend its expertise to organizations concerned with recording and preserving the American heritage of architecture. We address, in particular, programs leading to degrees in historical preservation and organizations concerned with religious edifices. We ask you to cooperate in this essential work by alerting us to programs already underway and to organizations who have surveyed architecture, but who do not have a specialist who can aid them to survey the stained glass within such buildings.

The Census of Stained Glass Windows in America, through its Director, was presented the 1990 Boston Society of Architects Award for Historic Preservation. Previous recipients have included Richard Cardinal Cushing in 1970 for his restoration of St. Stephen's Church, one of Charles Bulfinch's finest works, John Codman, for conceiving the Beacon Hill Historic District, and Susan E. Schur for the journal, *Technology and Conservation*.

For further information contact Virginia C. Raguin, CSGA Director  
College of the Holy Cross, Worcester, MA 01610

---

### CONSERVATION AND RESTORATION OF STAINED GLASS: AN OWNER'S GUIDE

prepared by  
The Census of Stained Glass Window in America Inc.

This forty-page illustrated booklet covers all major questions in stained glass repair. Attention is paid to the importance of conserving an architectural art form that commemorates the religious, social, and economic history of a community. The dangers of over zealous restorations are reviewed. The text describes the essential elements of a stained glass window and includes a glossary of terms describing the varieties of windows and their technical structures. Simple steps are given to help plan a conservation campaign, such as suggestions for photographic and written documentation, points to be noted in examining the structural and decorative fabric of the windows, and questions to ask potential restorers. A section is devoted to specific cleaning and mending methods, those approved and those to be avoided. The owner is also given suggestions for adapting windows to alternate installations and purchasing security and insurance. The important and often controversial issues of the reinstallation of restored panels and the possible benefits and drawbacks of protective glazing are included. The booklet also includes a list of agencies dealing with conservation issues and a selected bibliography of works on historic stained glass.

The booklet is designed as an unbiased guide for the owner of architectural stained glass, and certainly no church or public building with stained glass windows should be without it. **The Old House Journal** calls the Owner's Guide "a must-have for any person or group interested in restoring stained glass. It should prove of special use for church and synagogue restorations." Several large Episcopal dioceses and Preservation Societies have made bulk orders of the guide so that all of the churches under their protection would have an informed guide.

The booklet is available through  
Stained Glass Associates  
Box 1531, Raleigh, NC 27602  
Telephone (919) 266-2493 or 833-7668  
See reverse for prices and sample page

## GUIDELINES FOR A RESTORATION CAMPAIGN OF STAINED GLASS

### SURVEY, DELIBERATE, COOPERATE

Most owners of buildings are accustomed to issues of furnace, roof, or window repair because these are aspects common to all buildings. A caretaker of stained glass may, in all likelihood, be faced with decisions about the care of windows for the first (and last) time. This makes decisions very hard since there is literally no way of learning from experience. It is important for caretakers of stained glass to come together and to pool resources and experiences. Before going outside to costly consultations in the "for-profit" world, use your own resources, study, compare notes, link arms, and be prepared to make yourself into the most exacting client possible.

#### SURVEY IN PHOTOGRAPH AND WRITTEN FORM

Unless you have money to burn, you are very poorly served by asking professionals what you can do yourself. **YOU CAN MAKE A WRITTEN AND PHOTOGRAPHIC SURVEY OF YOUR WINDOWS ON YOUR OWN.** Without a photographic record of your windows you are giving permission to a restorer to destroy windows. Without before and after images, there is no way of evaluating work done.

Do not let inexperience hinder you. First, find a member of your congregation with an interest in photography and have them experiment with several rolls of film. Approximately \$15-20 per roll of film of 36 slides "wasted" while learning certainly offsets the \$400-\$1,000 a day often charged by consultants in stained glass restoration or professional photographers.

#### SUGGESTED PROCEDURE

1. Use quality camera and either ASA 200 or 400 speed film.
2. Do not shoot into direct sun. You will have too much glare. A bright overcast day will give you the most even light. A tripod is helpful.
3. Color slides: entire window and 3 details
4. Black and White: entire window and 3 details, processed as contact prints (inexpensive and allows selective printing afterwards)
5. Laser prints of color slides are available from many copier places (Kinkos, Charrette, etc. ) The prints are excellent quality and cost about \$3 for the first and \$2 for additional copies. These are extremely useful and far cheaper than the printing of standard photographs.

#### DELIBERATE AND COOPERATE

Ask members of your congregation, other congregations, and local institutions for help. Roman Catholic churches should try Boston College or any of the Catholic High Schools for student help. Use the Census of Stained Glass Windows in America Survey forms and research the Archdiocesan Archive or newspapers of the time of the dedication of your building. Many students may be able to help as part of their course work. Even if you "pay" for this work, this is far less expensive than leaving historical issues to professional consultants. You may consider asking a student to work for 10-20 hours at \$5 per hour. Such pay is commensurate with work/study salaries on college campuses.

#### INSURANCE AND RESTORATION

You will need a photographic record for any commercial insurance. What would it cost you to replace these windows, if destroyed, with windows of the same size and technique? If you get estimates from three reputable studios this should suffice. Any studio repairing your windows must insure your windows for this amount during their removal, restoration, and replacement. Your photographic inventory will also go a long way to guaranteeing quality work from the studio you engage.

## APPENDIX 9

### DIRECTIONS FOR CENSUS FORMS

Complete the site data form and draft a plan of the building with all windows numbered BEFORE filling in the individual window data forms. Use only one form for multiple identical art glass windows, but note location and number of all the windows on that form i.e. L2-L6. If an exact date is not known but a circa date is, indicate this with a C. If the artist or studio is documented by other means than a signature, note the source in the Bibliography. If conjecture, indicate origin of opinion, such as the researcher's name. Signatures and Inscriptions should be noted exactly as written, with misspellings or peculiarities, such as script, or upper or lower case. A line change should be indicated with a backslash /.

### SUBJECT MATTER

The subjects of a window are sometimes difficult to recognize. One can only make an effort and include a sufficient description of the window to help a reader. If the subject is known, include anything unusual about the window. For example, a Visitation scene might show both husbands as well as Mary and Elizabeth participating in the Visitation scene. A handy paperback guide to symbolism often makes interpretation of subjects easier.

James Hall. Dictionary of Subjects and Symbols in Art. New York: Harper & Row; Icon Editions. Most recent and comprehensive.

George Ferguson. Signs and Symbols in Christian Art. New York: Oxford University Press.

Emile Male. The Gothic Image. Princeton: Princeton University Press. Particularly for Gothic Revival programs.

### RESTORATION

It is inevitable that surveyors will be asked questions about the condition of the windows and methods of repair. However, The Census is a not-for-profit organization and forbidden to enter into this area in specific cases. The CSGA Constitution states: "The personnel of this organization will not offer any services in assessing monetary value of stained glass windows, nor will it recommend either restorers or methods of restoration. Nor will its publications or activities in any way whatsoever provide information relative to the sale or purchase of stained glass windows. The purpose of the organization is to record information, to make it publicly available, and to encourage the preservation and appreciation of the art in this country." However, The Census is aware of the need to encourage high standards of conservation and restoration and has published an unbiased guide which addresses these issues: Conservation and Restoration of Stained Glass: An Owner's Guide. Take one copy of the booklet with you on site, and give the church/building owner the flyer explaining how to obtain the booklet. In the Philadelphia area, surveyors can also refer questions to the Philadelphia Historic Preservation Corporation's Historic Religious Properties Program.

## TYPE OF GLASS AND TECHNIQUE

**Antique Glass:** Hand-rolled mouth-blown clear or colored glass made by old glassblowing methods.

**Cathedral Glass:** Commercial, machine-rolled translucent stained glass.

**Opalescent Glass:** Glass typical of American studios from the 1880s-1920s, variegated in color, often of a milky, iridescent appearance.

**Art Glass:** Commercially designed and mass-produced windows, usually ornamental design and often employing opalescent glass.

**Slab (dalle de Verre):** Pieces of glass, usually about one inch thick, often faceted, set within a concrete or epoxy resin matrix. A Modern type of glass.

**Jewels or Cast Glass:** Nuggets of glass inserted into windows for a decorative effect.

**Drapery:** Opalescent type of glass formed into ridges to resemble drapery folds.

**Plating:** The use of one piece of glass on another of a different texture or color and leading them together for a special effect. Very often used in glass by Tiffany, La Farge, and other studios of the opalescent era.

**Flashed Glass:** A thin, concentrated layer of colored glass fused to the surface of another piece of colored or clear glass.

**Vitreous Paint:** A mixture of finely ground glass, metallic oxides, and a liquid mixing agent used for painting on glass.

**Enamels:** Vitreous colors applied to glass.

**Silver Stain:** A nitrate applied to the exterior of glass. When fired it produces a variety of yellow shades. Silver stain was used with great sophistication in 19th-century styles, especially in the canopy designs that frame figural images.

**Etching or Sand Blasting:** Processes that alter the surface of the glass with acid or sand at high pressure; often a layer of another color glass is revealed (see flashed glass). Often used in inscriptions.

**Lead Came:** Most common form of connecting individual pieces of glass. Usually of an "H" profile.

**Copper-foil:** Thin strips of copper floated on solder often used to mend cracks.





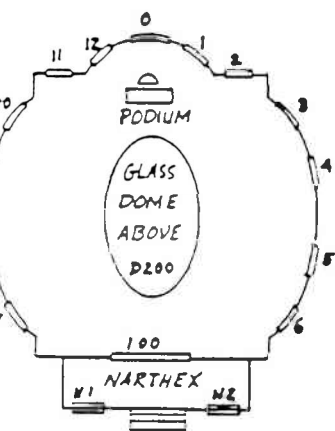
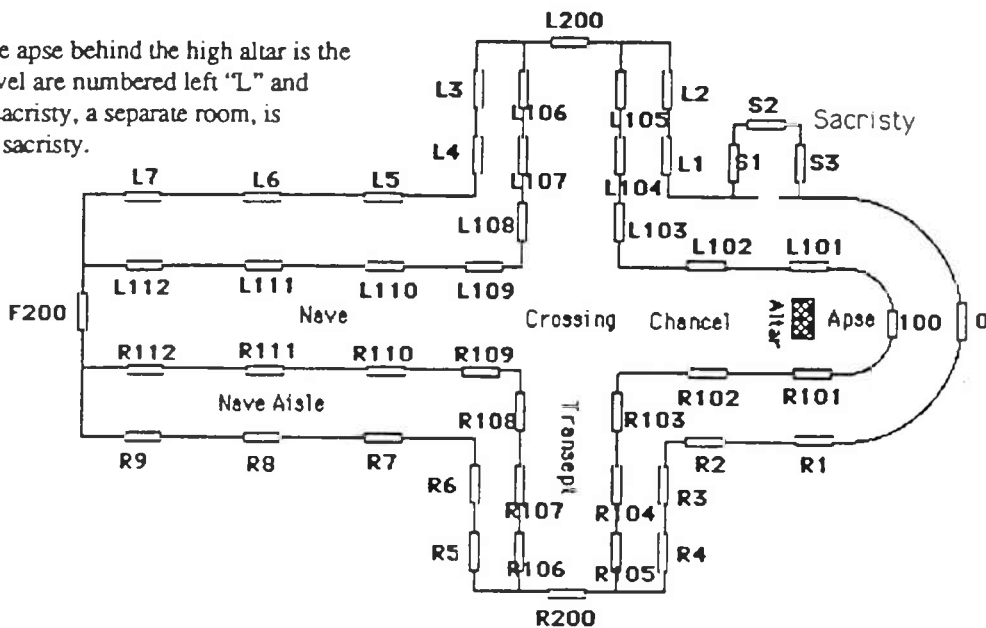
# The Census of Stained Glass Windows in America

## NUMBERING WINDOWS AND WINDOW SHAPES FOR SITE LIST FORMS

Two numbering systems are suggested but both require that numbering begin at the focal point of the space (altar, ark, podium, etc.) All windows are numbered whether or not they contain stained glass, although only one window data form should be used for identical art glass windows. Ground floor windows are numbered from 0 to 99; next level from 100 to 199 and so on. The facade, "F" is numbered left to right. Windows in ancillary spaces should be numbered clockwise beginning left of entry. The two numbering systems are the SYMMETRICAL SYSTEM and the CONSECUTIVE SYSTEM. The symmetrical system is preferred.

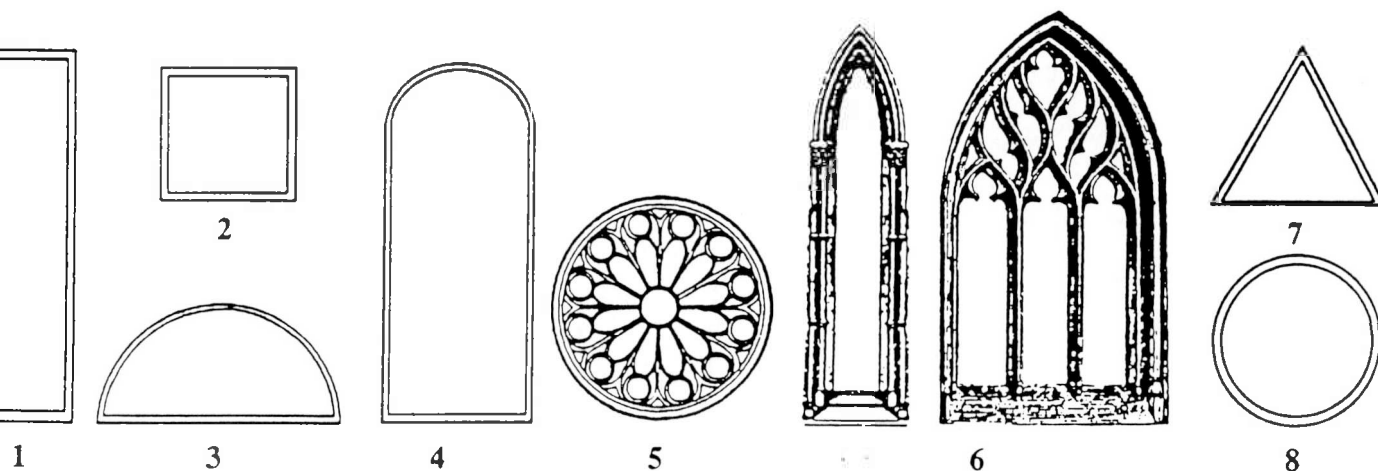
### SYMMETRICAL SYSTEM

In a full cathedral plan, the center of the apse behind the high altar is the focal point. Windows within the same level are numbered left "L" and right "R" consecutively. Notice that the sacristy, a separate room, is numbered separately preceded by "S" for sacristy.



### CONSECUTIVE SYSTEM

Example of a building with two levels of windows and a glass dome in the ceiling. The building is numbered consecutively and clockwise from the focal point behind the podium. The narthex is numbered separately and the dome on the third level is preceded by "D" for dome.



### WINDOW SHAPES

General window shapes are presented. You will find a variety of forms. For example, lancet windows (No. 6) may have a single or multiple lights. Two forms may be combined, such as Nos. 1 and 3. Select the shape(s) that corresponds most closely to the window under study and enter the number on the line designated "Window Shape."



# *The Census of Stained Glass Windows in America*

## SITE DATA

Researcher \_\_\_\_\_ Organization \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone: Day (\_\_\_\_) \_\_\_\_\_ Evening (\_\_\_\_) \_\_\_\_\_

Date of Survey \_\_\_\_\_ Time Expended \_\_\_\_\_

Present Name of Building \_\_\_\_\_

Original Name of Building \_\_\_\_\_

Function or Type (if religious, include denomination) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ County \_\_\_\_\_

Contact person and Title \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_

Year of Construction \_\_\_\_\_ Architect \_\_\_\_\_

Alteration Year \_\_\_\_\_ Architect \_\_\_\_\_

Number of Figural Windows \_\_\_\_\_ Number of Ornamental Windows \_\_\_\_\_  
(Include scenic or abstract) (Standard catalogue patterns routinely reproduced)

Complete the building sketch plan on reverse using the following key. If other abbreviations are needed, please indicate them on the key. A NORTH directional arrow should be placed in the circle provided.

B = Baptistry

F = Facade

N = Narthex

SK = Skylight

CH = Chapel

H = Hall

R = Right

ST = Stair

D = Dome

L = Left

S = Sacristy

T = Tower

Window Summary Report \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# The Census of Stained Glass Windows in America

## WINDOW DATA

Searcher \_\_\_\_\_ Local Organization \_\_\_\_\_  
Building \_\_\_\_\_ City \_\_\_\_\_ Survey Date \_\_\_\_\_  
Location and Number on Plan \_\_\_\_\_ Photo Documentation ☐ yes ☐ no  
Dimensions \* HT   FT   IN WD   FT   IN Date \_\_\_\_\_ ☐ Documented, or ☐ Conjectured  
Type \_\_\_\_\_ Number of lights \_\_\_\_\_ Tracery ☐ yes ☐ no  
Artist or Studio \_\_\_\_\_ ☐ Documented, or ☐ Conjectured  
Signature \_\_\_\_\_  
Subject \_\_\_\_\_  
Descriptions \_\_\_\_\_

### Color of Glass and Technique (Check as many as apply)

<input type="checkbox"/> Opalescent	<input type="checkbox"/> Drapery	<input type="checkbox"/> Vitreous Paint
<input type="checkbox"/> Antique or Cathedral	<input type="checkbox"/> Machine Textured	<input type="checkbox"/> Silver Stain
<input type="checkbox"/> Slab (dalle de Verre)	<input type="checkbox"/> Jewels or Cast Glass	<input type="checkbox"/> Enamels
<input type="checkbox"/> Plating	<input type="checkbox"/> Lead Came	<input type="checkbox"/> Acid Etching or Sandblasting
<input type="checkbox"/> Flashed glass	<input type="checkbox"/> Copper-foil	<input type="checkbox"/> Other _____

### Full Description of Subject (and Coats of Arms if applicable)

For \_\_\_\_\_ Memorial to \_\_\_\_\_

Condition: Matrix \_\_\_\_\_ Deflection \_\_\_\_\_ Glass \_\_\_\_\_ Paint \_\_\_\_\_ Dirt \_\_\_\_\_ Prev. Repair \_\_\_\_\_

(0 = Excellent, 1 = Good, 2 = Fair, 3 = Poor)

Frame ☐ Wood ☐ Stone ☐ Metal

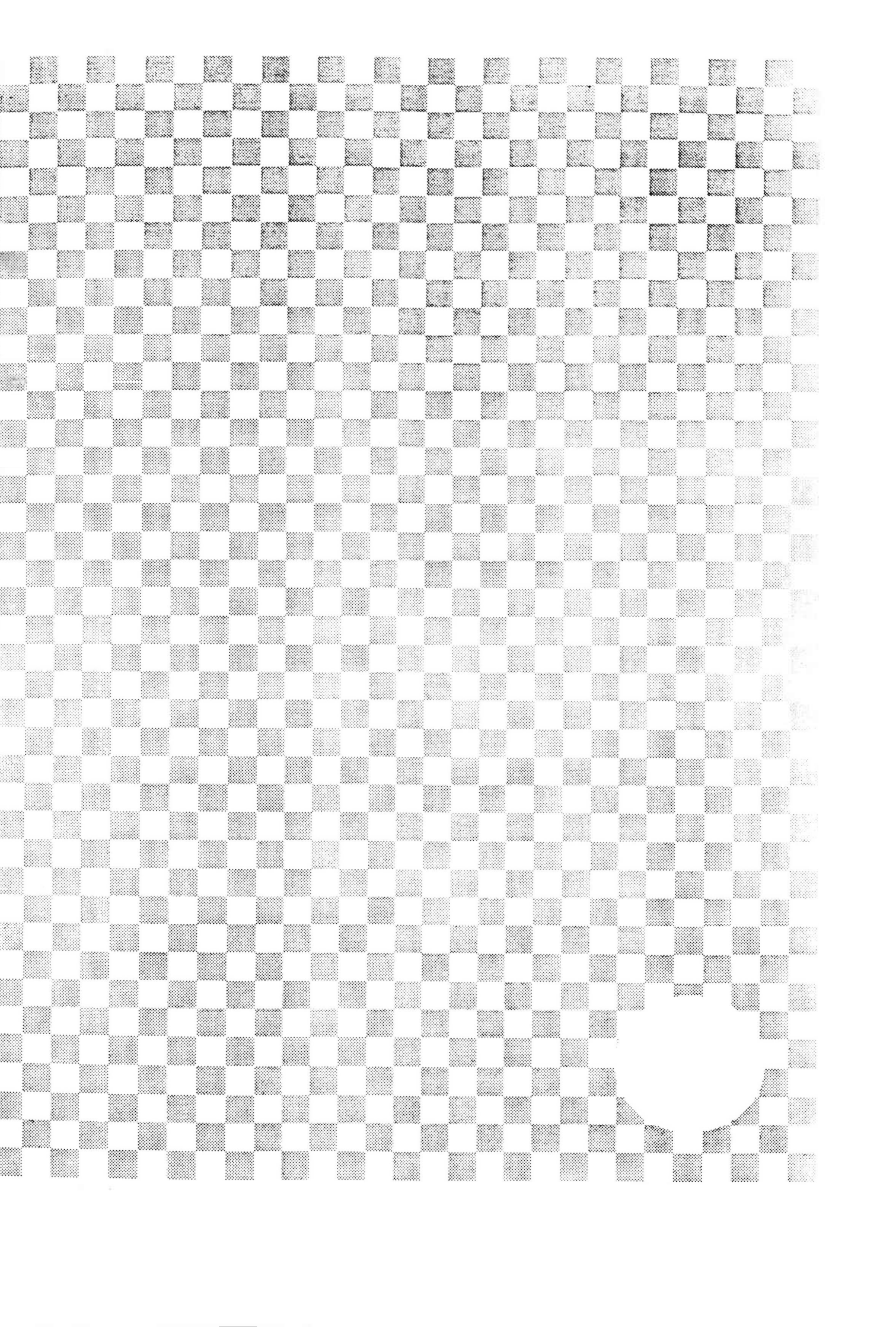
Interior Protection ☐ Leaded glass panels ☐ Laminated or tempered glass ☐ Wire

☐ Acrylic or polycarbonates Vented? ☐ yes ☐ no

Installation \_\_\_\_\_ Date \_\_\_\_\_

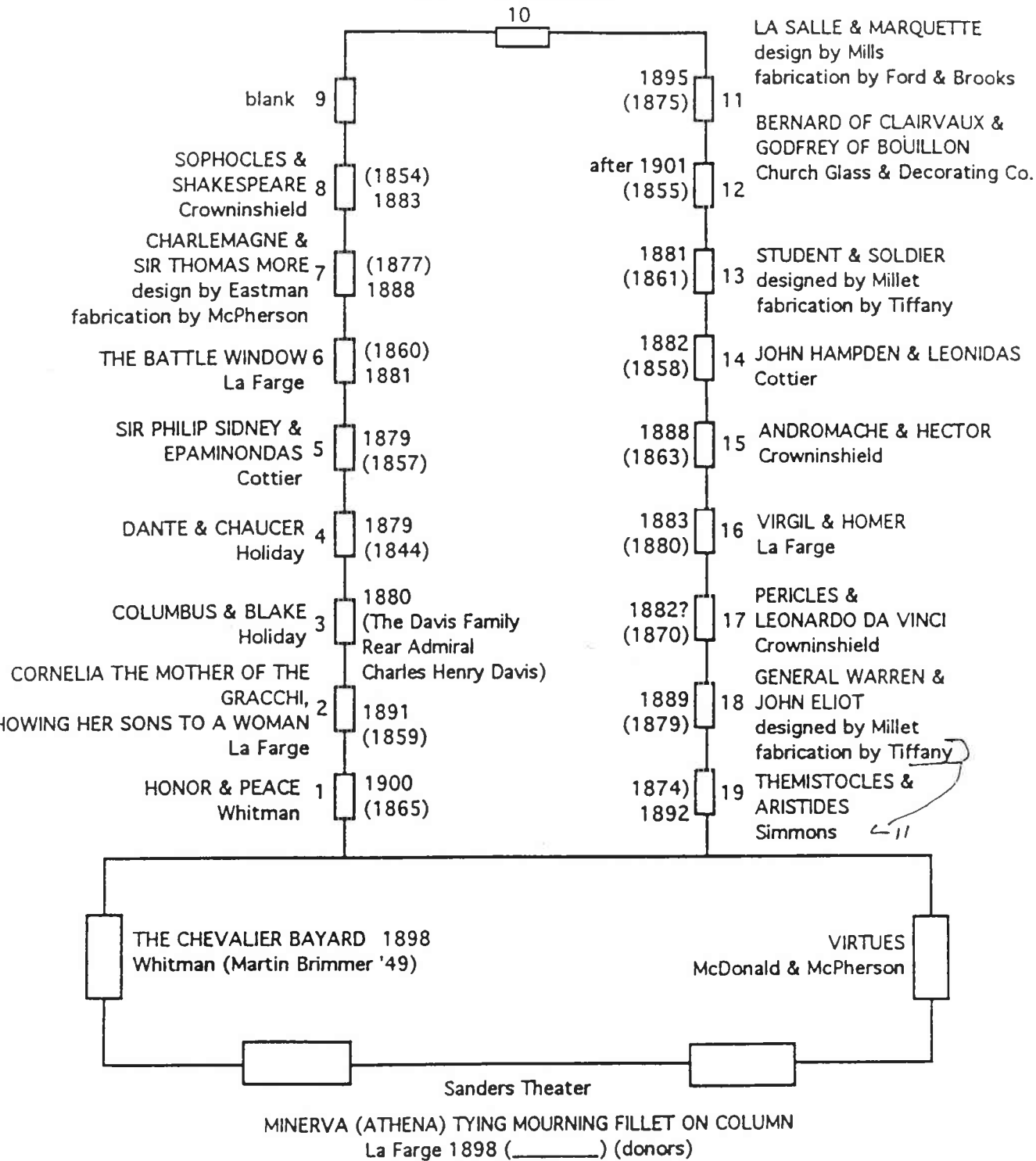
Photography \_\_\_\_\_

Information on this form is limited to educational and scientific purposes. Any other use constitutes action totally independent of the CSGA and completely dissociated from its purposes. The CSGA and the above named organization assume no liability for the information contained herein and do not represent that said information is warranted to be correct and complete. \*Dimensions may be approximate.



HARVARD UNIVERSITY  
MEMORIAL HALL

GRISAILLE EMBLEMS OF COUNTRY & COLLEGE  
McDonald & McPherson



## APPENDIX 11

### *Pro forma: Profile of a Studio*

- 1 Description of studio:
  - history
  - facilities
  - level of experience
  - members of staff and associates
  - curriculum vitae.
- 2 Work and Materials
  - samples from qualified members
  - descriptions of standards of lead, putty, flux, cleaning
  - description of paint consolidation, sample and techniques used.
- 3 Documentation of three recent projects
  - photographs
  - clients and contact information
  - restoration policy and description of work
- 4 Evaluation and cost estimate
  - for each window
- 5 Policies and philosophy concerning protective glazing
  - description of firms with which studio has contracted work

## APPENDIX 12

# STAINED GLASS CONDITION REPORT

Object Number						Origin						Date											
Description												Measurements											
Reporting Conservator												Date											
Conservator				Hours Spent																			

## GLASS

### 1. Type

Antique.....☐ Cathedral.....☐ Dalle De Verre...☐

### 2. Colour

Pot Metal.....☐ Flashed.....☐ Tint.....☐ Opalescent....☐

### 3. Thickness

Uneven.....☐ Uniform.....☐

### 4. Defects in Making

Air Bubbles.☐ Other.....☐ None.....☐

**General Comments on Glass :**

### 5. Damage

Cracks.....☐ Quantity.....☐

Clean.....☐ Grozed.....☐

Chips.....☐ Loose Fragments..☐ Holes.....☐

Difficult to Assess..☐

**General Comments on Damage:**



GLASS

6. Condition of Glass

Pitting.....	<input type="checkbox"/>	Corrosion.....	<input type="checkbox"/>	Scratches.....	<input type="checkbox"/>
Front.....	<input type="checkbox"/>	Front.....	<input type="checkbox"/>	Front.....	<input type="checkbox"/>
Back.....	<input type="checkbox"/>	Back.....	<input type="checkbox"/>	Back.....	<input type="checkbox"/>

General Comments on Condition:

7. Deposit from Structural Bars

Yes.....	<input type="checkbox"/>	No.....	<input type="checkbox"/>
----------	--------------------------	---------	--------------------------

PAINT AND STAIN

1. Type

Oxide.....	<input type="checkbox"/>	Enamel.....	<input type="checkbox"/>	Silver Stain....	<input type="checkbox"/>
Front.....	<input type="checkbox"/>	Front.....	<input type="checkbox"/>	Front.....	<input type="checkbox"/>
Back.....	<input type="checkbox"/>	Back.....	<input type="checkbox"/>	Back.....	<input type="checkbox"/>

Comments :

2. Paint and Enamel Condition

Lost.....	<input type="checkbox"/>	Flaking.....	<input type="checkbox"/>	Scratches.....	<input type="checkbox"/>
Front.....	<input type="checkbox"/>	Front.....	<input type="checkbox"/>	Front.....	<input type="checkbox"/>
Back.....	<input type="checkbox"/>	Back.....	<input type="checkbox"/>	Back.....	<input type="checkbox"/>
Crizzling.....	<input type="checkbox"/>	Bad Firing.....	<input type="checkbox"/>		
Front.....	<input type="checkbox"/>	Front.....	<input type="checkbox"/>		
Back.....	<input type="checkbox"/>	Back.....	<input type="checkbox"/>		

Stable :

## LEADS

### 1. Width of Flange

1/16th.....☐      1/8th.....☐      3/16th.....☐      1/4.....☐

5/16th.....☐      3/8th.....☐      1/2.....☐      Other.....☐

### 2. Type

Beaded.....☐      Round.....☐      Flat.....☐

Cast.....☐      Milled.....☐      Extruded.....☐      Difficult to Assess ☐

### 3. Condition of Lead

Sound.....☐      Corrosion.....☐      Extensive.....☐      Minimal.....☐

Difficult to Assess.. ☐

### 4. Breaks at Solder Joints

Yes.....☐      No.....☐      Other Areas.. ☐

### 5. Unsoldered Joints

Yes.....☐      No.....☐

Back.....☐      Front.....☐      Extensive.....☐

Multiple Leads ☐      Perimeter Only.....☐      Difficult to Assess.....☐

Panel Bowing.. ☐

**Comments :**

## CONSTRUCTION OF PANEL

### 1. Divisions

Yes.....☐      No.....☐      Number.....☐

### 2. Bars

Yes.....☐      No.....☐      Number.....☐

### 3. Copper Ties

Yes.....☐      No.....☐      Number.....☐

Lost .....☐      Intact.....☐

### 4. Copper Wire

Yes.....☐      No.....☐      Perimeter.....☐      Hooks.....☐

### 5. Frame

None.....☐      Wood.....☐      Metal.....☐

**Comments:**

**CEMENT & PUTTY**

**1. Condition**

Powdering. ☐      Brittle.....☐      Lost.....☐

**General Comments on Condition :**

**2. Deposit on Glass Face**

Yes.....☐      No.....☐      Extensive.....☐

**Comments :**

## SURFACE ACCRETIONS

### GLASS

Dust.....☐

Grime.....☐

Biological Growth.....☐

Other.....☐

Comments :

### 2. Applied Coating

Yes.....☐

No.....☐

Comments :

### LEADS

#### 1. Applied Coating

Blackening.....☐  
eg. (Zebrite)

Paint.....☐

Comments :

#### 2. Flux/Tallow on Lead Face

Yes.....☐

No.....☐

Extent :

## PREVIOUS RESTORATION

### REPAIRS

#### 1. Adhesive Repairs

Yes.....☐ No.....☐

#### 2. Discoloured

Yes.....☐ No.....☐

#### 3. Smeared on Glass Surface

Yes.....☐ No.....☐ Front.....☐ Back.....☐

**Comment on Extent :**

#### 4. Adhesive Tape Repairs

Yes.....☐ No.....☐

**Comment on Extent :**

#### 5. Copper Foil Repairs

Yes.....☐ No.....☐

**Comment on Extent :**

## PREVIOUS RESTORATION

### 1. Cement/Putty Repairs

Yes.....☐      No.....☐      Difficult to Assess ☐

**Comment on Extent :**

### 2. Reglazing

No.....☐      Yes.....☐      Partial Reglazing..☐

### 3. Have Additional Leads Been Incorporated

Yes.....☐      No.....☐      Obtrusive .....☐      Suspect.....☐

Strap Leads..☐      Copper Foil...☐

**Comments :**



PREVIOUS RESTORATION

OVERPAINTING

1. Fired

Over Original Glass.....☐ Over Original Glass Paint.....☐

Condition

Unstable.....☐ Sound.....☐

Comments :

2. Unfired

Acrylic.....☐ Oil Based.....☐ Other.....☐

Condition

Unstable.....☐ Sound.....☐

Comments :

## PREVIOUS RESTORATION

### LATER ADDITIONS

#### Glass

Evidence.....☐    Obtrusive.....☐    Suspect.....☐    None.....☐

**Comments :**

#### Back Plates

Yes.....☐    No.....☐

#### Condition

Damaged....☐    Sound.....☐

#### Front Plates

Yes.....☐    No.....☐

#### Condition

Damaged....☐    Sound.....☐

**Comments :**

#### Damage Caused By Bad Handling

Yes.....☐    No.....☐    Suspect.....☐

**Comments :**

## TREATMENT RECORD (PRACTICAL)

**SUMMARY OF TREATMENT :**

**Glass :**

**Lead :**

**Paints & Enamels :**

**Cement :**

**Frame :**

**Comments :**

## TREATMENT RECORD DOCUMENTATION

### PHOTOGRAPHY

Large Format

Black & White

Colour Trans

Before Conservation..... ☐ ..... ☐ ..... ☐

During Conservation..... ☐ ..... ☐ ..... ☐

After Conservation..... ☐ ..... ☐ ..... ☐

### DIAGRAMS

Rubbings..... ☐

Drawings..... ☐

LEAD SAMPLE..... ☐      Filed with Report..... ☐

FRAGMENTS REMOVED..... ☐      Filed with Report..... ☐

NEW COSHH ASSESSMENT FORM REQUIRED.... ☐

FULL REPORT COMPLETED (Not Summary)..... ☐

Comments :

APPENDIX 13

SITE SURVEY

Job No:

Date:

LOCATION:

---

1. Architect/Vicar/Church Warden:
2. Position of Window:
3. Date/Subject of Window:
4. Maker of Window:
5. Measurements (overall):
6. Number of lights (+ measurements):
7. Number of panels/light:
8. Number of Tracery panels:
9. Access (inside):
10. Height to cill (inside):
11. Cill/Condensation Tray:
12. Number of Saddle Bars each light:
13. Section of Bars (incl. sizes):
14. Condition of Bars:
15. Connection Bars - Copper Ties:
16. Method and Condition of fixing (inside):
17. Colour of stone (inside):
18. Condition of stonework/wood (inside):
19. Condition of panels:
20. Condition of Cementing:
21. Type of Lead:
22. Condition of leading:
23. Condition of glass (inside):

24. Condition of paintwork (inside):
25. Access (outside):
26. Height to cill (outside):
27. Protective glazing/wire guards:
28. Interspace wire guards - glazing:
29. Ferramenta/Stanchions:
30. Section of Ferramenta/Stanchions:
31. Condition of fixing (outside):
32. Colour of stone (outside):
33. Condition of stonework/wood (outside):
34. Condition of glass (outside):
35. Backplating:
36. Condition of paintwork (outside):
37. Earlier Restorations:
38. Ladders of site:
39. Mileage:
40. NOTES

## CATHEDRAL STUDIOS

## DOCUMENTATION OF CONSERVATION

Location	Panel
Window	Measurements (h x w)
Date removed.....	Date reinstalled.....

Conservator	Date began	Finished
.....	.....	.....
.....	.....	.....
.....	.....	.....

## A. CONDITION REPORT

## GLASS

## 1. Type

Antique.....\_\_ Cathedral.....\_\_ Others.....

## 2. Colour

Pot Metal.....\_\_ Flashed.....\_\_ Tint.....\_\_ Opalescent.....\_\_

## 3. Thickness

Thick.....\_\_ Thin.....\_\_ Uneven.....\_\_ Uniform.....\_\_

General Comments on Glass:

## 4. Damage

Cracks.....__	Cause.....
Shells.....__	Cause.....
Loose Fragments..__	Cause.....
Holes.....__	Cause.....
Crazed.....__	Cause.....

## 5. Dirt

Dust.....\_\_ Grime.....\_\_ Deposits from bars.....\_\_

Others.....

Comments

6. Condition of Glass

Pitting.....__	Corrosion.....__	Sub-Surface Corrosion..__
Front.....__	Front.....__	Front.....__
Back.....__	Back.....__	Back.....__

General Comments:

PAINT AND STAIN

1. Type

Oxide.....__	Enamel.....__	Silver Stain.....__
Front.....__	Front.....__	Front.....__
Back.....__	Back.....__	Back.....__

2. Paint and Enamel Condition

Lost.....__	Loose.....__	Flaking.....__	Scratches.....__
Front.....__	Front.....__	Front.....__	Front.....__
Back.....__	Back.....__	Back.....__	Back.....__

Frizzling.....\_\_

Front.....\_\_

Back.....\_\_

General Comments on Surface Decoration:

LEADS

1. Width of Flange.....

2. Type



3. Deterioration of Lead

Yes.....\_\_ Extensive.....\_\_

Comments

4. Breaks at Solder Joints

Yes.....\_\_ No.....\_\_

Comments on Extent

5. Breaks at Other Areas

Yes.....\_\_ No.....\_\_

Comments on Extent

6. Multiple Leads

Yes.....\_\_ No.....\_\_ Difficult to Assess.....\_\_

Comments on Extent

7. Other Comments

CONDITION OF PANEL

1. Bowing

No.....\_\_ Yes.....\_\_ (specify).....

2. Bars

Number.....\_\_ Material..... section.....

3. Ties

None.....\_\_ Copper.....\_\_ Lead.....\_\_ Number.....

B. PREVIOUS RESTORATION

REPAIRS

1. Adhesive

Yes.....\_\_ No.....\_\_ Extent.....  
specify.....  
Discoloured.....\_\_ Smeared.....\_\_

2. Strap Leads

Yes.....\_\_ No.....\_\_ Extent.....

3. Copper Foil

Yes.....\_\_ No.....\_\_ Extent.....

4. Adhesive Tape

specify.....  
Yes.....\_\_ No.....\_\_ Extent.....

5. Releading

Yes.....\_\_ No.....\_\_ Extent.....

LATER ADDITIONS

1. Glass

None.....\_\_ Stopgap.....\_\_ New Glass...\_\_

2. Plating

Backplating....\_\_ Damaged.....\_\_ Tinted.....\_\_  
Front Plating..\_\_ Damaged.....\_\_ Tinted.....\_\_

3. Applied Coating

Yes.....\_\_ No.....\_\_ Extent.....

## OVERPAINTING

### 1. Fired

Over original glass.....\_\_ Over original glass paint.....\_\_

None.....\_\_ Suspect.....\_\_

Condition:

Stable.....\_\_ Unstable.....\_\_

Comments

### 2. Unfired

Acrylic.....\_\_ Oil Based.....\_\_ Other.....\_\_

Condition:

Stable.....\_\_ Unstable.....\_\_

Comments

C. CURRENT CONSERVATION

GLASS

1. Cleaning

Deionised water...\_\_ Glass fibre brush..\_\_  
Scalpel.....\_\_ Airbrasive.....\_\_ Other.....\_\_  
Comments

2. Repair

Edge joined by adhesive (specify).....  
Edge joined by other (specify).....  
Insertion of new glass....\_\_  
Insertion of old glass....\_\_  
Artificial filling (specify).....  
Plating.....\_\_  
Consolidation by coating with.....  
Comments

PAINT

Consolidated (specify).....  
New paint on plating.....  
Comments

LEADS

Releaded.....\_\_  
New lead leave.....\_\_  
Cemented.....  
Additional framing (specify).....

GENERAL COMMENTS

## APPENDIX 15

### MATERIALS AND EQUIPMENT USED IN STAINED GLASS CONSERVATION.

#### ABRASIVES & POLISHES.

Flexi-i-Grit Abrasive Film.

Solvol Autosol Abrasive Paste.

Glass Paper.

Steel Wool.

Archival Aids Ltd.

Solvolene Lubricants Ltd.

Hardware shops.

Hardware shops.

#### ADHESIVES & ADHESIVE TAPES.

~~Hxtol Nyl-1 EPOXY resin~~  
~~Ablebond 342/1 Epoxy Resin.~~

H.M.G. Celulose Nitrate Adhesive.

Aluminium Tape.

Copper Tape.  
Ltd

Sellotape

~~Stuart R. Stevenson~~  
~~Archival Aids Ltd.~~

Archival Aids Ltd.

Autowrappers Ltd.

Stained Glass Supplies

Stationers.

#### CLEANING MATERIALS.

White Spirit.

Synperonic N Non-Ionic Detergent

Deionising Unit (Elgastat)

Destatol Perspex Cleaner

Nitromors Paint Stripper (water based)

B D H Chemicals Ltd.

B D H Chemicals Ltd.

Elga Products Ltd.

Visijar Plastics.

Ironmongers.

#### DRAWING MATERIALS.

Felt Pens.

Rotring Pens.

Tracing Paper.

Detail Paper.

Melinex.

Don Cresswell Ltd.  
Art Suppliers.

Rotring Drawing Equipment

Art Suppliers.

Art Suppliers.

Polyester Convector Ltd.

## GLASS

Antique Glass

Hetley Glass Ltd.

General Supplies.

Stained Glass Supplies

Ltd.

Bevelled cut & Float Glass.

Instrument Glasses Ltd.

## GLASS CUTTERS.

Glass Cutters.

Stained Glass Supplies.

I.W.F. Ltd.

Glass Grinders.

Stained Glass Supplies

Ltd.

## GLASS PAINTING.

Glass Paints

Deancraft Fahey Ltd.

Stained Glass Supplies

Ltd.

Gum Arabic

As Above.

Silver Stain

As Above.

Badger Brushes.

Ploton Sundries Ltd.

## GLAZING MATERIALS

Lead

Heaps, Arnold & Heaps Ltd

Hetley Glass Ltd.

Stained Glass Supplies.

Solder.

As Above.

Tallow Sticks

As Above.

Leather Aprons

I.W.F Ltd.

Copper Wire

J, Smith & Sons Ltd

Arboflex 500 (Glazing Putty)  
Ltd

Adshead Ratcliffe & Co

Zebrite (Grate Polish)

Hardware Shops.

Lead Vice

Stained Glass Supplies.

Glazing Nails  
Ltd

Stained Glass Supplies

### MOULDING MATERIAL.

Investment Powder.

Hoben Davies Ltd.

Barasil Putty.

Pattrell & Co.

### PACKING MATERIALS.

Plastazote

Polyformers Ltd.

### RETOUCHING PAINTS

Acrylic Paints

Daler-Rowney Ltd.

Pigments/Dyes.

BASF.  
Ciba Geigy Ltd.

Intenso Colours.

Keeps Ltd.

### GENERAL EQUIPMENT

Aluminium Frames.

I.W.F. Ltd.

Brushes.

Winsor & Newton

Cavi-jet.

Dentsply Ltd.

Dazor Magnifier.

Alexandra Light Diffuser.

Flexi-drive Drill

Morris Flex Ltd.

General Tools

Buck & Ryan Ltd

Kiln Equipment.

Fulham Pottery Ltd.

Lightbox Supplier.

CLE Design Ltd.

Microscope.  
Ltd.

Finlay Microvision Co

Scalpels

Swann Morton Ltd.

Silicone Paper.

Archival Aids Ltd.

Tweezers

M.S.Walsh Te Grey.

ADDRESSES OF SUPPLIERS.

ADSHEAD RATCLIFFE & CO LTD.  
Derby Rd,  
Belper,  
Derby,  
DE5 1WJ.

ALEXANDRA LIGHT DIFFUSERS  
12 Dudley Rd,  
Wimbledon,  
London,  
SW 16.

01-540 3386.

ARCHIVAL AIDS LTD  
PO.Box 5.  
Spondon,  
Derby,  
DE2 7BP.

0332 666 400.

AUTOWRAPPERS LTD.  
23 - 25 Brunel Rd,  
East Acton,  
London,  
W3 7UR.

01-749 7371.

BASF.  
Dispersions & Pigments Division,  
PO,Box 4,  
Earl Rd,  
Cheadle Hume  
Cheshire,  
SK8 6QU.

B.D.H. CHEMICALS LTD.  
Freshwater Rd,  
Dagenham,  
Essex.  
RM8 1RF.

01-597 7591.

BUCK & RYAN.  
101 Tottenham Court Rd,  
London,  
W1P 0DY.

01-636 7475.

CLE DESIGN LTD.  
69 Haydons Rd,  
Wimbledon,  
London,  
SW19 1HQ.

01-540 5772.

CIBA - GEIGY LTD.  
Simonsway,  
Manchester,  
M22 5LB



COTTRELL & CO  
15 Charlotte St,  
London,  
W1P.

01-580 5500.

DEANCRAFT FAHEY LTD.  
12 Spedding Rd,  
Fenton Industrial Estate,  
Stoke-on-Trent,  
Staffordshire,  
ST4 2ST.

0782 414400.

DENTSPLY LTD.  
9 Madleaze Trading Estate,  
Bristol Rd,  
Gloucester,  
GL1 5SG.

0452 424351.

DON CRESSWELL LTD.  
Bridge House,  
Granger Park,  
London,  
N121 1RB.

E.PLOTON (SUNDRIES) LTD.  
273 Archway Rd,  
London,  
N6 5AA,

01-348 0318.

ELGA PRODUCTS LTD.  
Lane End,  
High Wycombe,  
Bucks,  
HP14 3JH.

0494 881393.

FULHAM POTTERY.  
8 - 10 Ingate Place,  
Battersea,  
London,  
SW8 3NS.

01-720 0050.

HEAPS ARNOLD & HEAPS LTD.  
Clarence Rd,  
Leeds,  
LS10 1UB.

0532 432519.

INSTRUMENT GLASSES LTD.  
Alma Rd,  
Ponders End,  
Enfield.

01-804 5824.

I.W.F. LTD.  
78a Forsyth Rd,  
Newcastle Upon Tyne,

NE2 3EU.

091 281 0945/  
2533.

JAMES HETLEY & CO LTD.  
Beresford Ave,  
Wembley,  
Middx,  
HAO 1RP.

01-903 4151.

MORRIS LTD.  
Briton Rd,  
Coventry.  
CV2 4LG

0203 611831.

POLYESTER CONVECTOR LTD.  
1/27 Sumner Rd,  
Peckham,  
London,  
SE15.

ROTRING DRAWING EQUIPMENT.  
Hartley, Reece & Co  
Building One,  
GEC Estate,  
East Lane,  
Wembley,  
Middx.  
HA9 7PY.

01-908 2577.

SOLVOLENE LUBRICANTS LTD.  
24 Reginald Square,  
London,  
E5 ODW.

01-985 2547.

STAINED GLASS SUPPLIES LTD,  
Unit 5,  
Brunel Way,  
Thornbury Industrial Estate,  
Bristol,  
BS12 2UR.

0454 419975.

SWANN MORTON LTD.  
Penn Works,  
Owlerton Green,  
Sheffield,  
S6 2BJ.

0742 344231.

VISIJAR PLASTICS LTD.  
Pegasus Rd,  
Croydon Airport,  
Surrey,  
CR9 4PR.

01-686 6341.

WILFORD POLYFORMERS LTD.  
Greaves Way,

Stanbridge Rd,  
Leighton Buzzard,  
Bedfordshire,  
LU7 8UB.

0525 376435.

WINDSOR & NEWTON.  
Ladysmith Rd,  
Wealdstone,  
Harrow,  
Middx.  
HA3 5RH.

01-427 4343.

Stuart R. Stevenson  
68 Clerkenwell Rd  
London EC1M 5QA

071 253 1693

## APPENDIX 16

### STAINED GLASS - BIBLIOGRAPHY

#### HISTORY/GENERAL

- ATTWATER, D., The Penguin Dictionary of Saints, Penguin 1986.
- BAKER, J., English Stained Glass, London. 1986.
- BRITISH SOCIETY OF MASTER GLASSPAINTERS., Journals.
- CAVINESS, M.H., Stained Glass Before 1540. G.K Hall & Co. 1983.
- CONNICK, C J., Adventures in Light and Colour. Harrap & Co Ltd 1937
- COWEN, P., A Guide to Stained Glass in Britain, M Joseph 1985.
- DAY, LEWIS. F., Windows, London. 1879.
- DRAKE, M., A History of English Glass Painting, London 1912.
- EVANS, D., Bibliography of Stained Glass, Baydell & Brewer, 1982.
- GODFREY, E., Development of English Glassmaking, Claredon Press 1975.
- HALL, J., Dictionary of Subjects & Symbols in Art, J. Murray Ltd 1984.
- HARRISON, M., Victorian Stained Glass, Barrie & Jenkins 1980.
- LEE, L., The Appreciation of Stained Glass, OUP. 1977.
- LEE, L., SEDDON, G., STEPHENS, F., Stained Glass, Mitchel Beazley, 1976
- MOORE, P., Crown in Glory. Jarrold. 1982.
- NELSON, P., Ancient Painted Glass in England. Methuen & Co Ltd 1913.
- OSBOURNE, J., Stained Glass in England. Fred Muller. 1981.
- PIPER, J., Stained Glass: Art or Anti Art. London 1968.
- RACKHAM, B., A Guide to the Collection of Stained Glass, V&A Museum London, 1936.
- SOWERS, R., The Lost Art. 1954.
- THEOPHILUS; On Divers Arts. Trans 1963. University of Chicago Press.
- WESTLAKE, N.H.J., A History in the Design of Painted Glass. London & Oxford, 4 Vols., 1881 - 1894.

## TECHNIQUE

- ARMITAGE, E.L., Stained Glass, History, Technology & Practice. 1959.
- DUNCAN, A., The Technique of Leaded Glass.
- DUTHRIE, A.L., Decorative Glass Processes. Dover Pubs. 1982.
- FRANK, S., Glass and Archaeology. Academic Press. 1982.
- ISENBERG, A&S., Stained Glass Painting. Cilton Book Co Ltd. 1982.
- MILLER, F., Glass Painting. Wyman & Sons. 1885.
- MOLLIKA, P., Stained Glass Primer. Vols 1&2. Mollica Press. 1979.
- REYNTIENS, P., The Technique of Leaded Glass. Batsford. 1977.
- WHALL, C.W., Stained Glass Work. London 1905.
- WINSTON, C., Glass Painting. John Murray. 1865.

## STAINED GLASS - BIBLIOGRAPHY.

### CONSERVATION/GENERAL.

ASHURST, J. & N., Practical Building Conservation Vol 5. Gower Technical Press Ltd. 1989. (31 - 71).

ASMUS, J.F., Use of Lasers in the Conservation of Stained Glass. Conservation in Archaeology & the Applied Arts IIC. 1973 (93-97).

BACHER, E., Medieval Stained Glass Restoration & Conservation, Conservation Paper 5, CAC 1977.

BETTEMBOURG, J.M., Conservation Problems of Early Stained Glass. Conservation Paper 6, CAC. 1977.

BETTEMBOURG, J.M., BURCK, J.J., DRIVIERE, J. & HENRY, J.P., Effects of Mastics on the Behavior of Stained Glass Windows, Adhesives & Consolidants, IIC Paris. 1984 pp( 195 - 198).

BRILL, R.H., Crizzling - A Problem in Glass Conservation. Conservation in Archaeology and the Applied Arts IIC. 1975. (pp 121-135.)

CONSERVATION & PRESERVATION OF STAINED GLASS; International Conference, Lunteren 1981.

DAVISON, S., The Problems of Restoring Glass Vessels, The Conservator, 2. 1978. pp3-8.

FRODL - KRAFT EVA, Medieval Stained Glass Corrosion-Conservation - Restoration. Conservation in Archeology and the Applied Arts. IIC. 1975. pp 105 - 110.

HOLDEN, A., Former Methods of Conservation; Stained Glass. British Museum Occasional Paper No 65. 1988.

JONES, S., The Conservation of Three Fourteenth Century Stained Glass Lancets. UKIC 30th Anniversary Preprints. 1988.

LOWE, J., The Conservation of Stained Glass. Conservation in Archeology and the Applied Arts. IIC. 1975. pp93 - 97.

LOWE, W., The Conservation of Stained Glass. Studies in Conservation. No 2. 1978. pp 3-8.

NOTMAN, J.A. & TENNENT, N.H., The Conservation and Restoration of a Seventeenth Century Roundel. Studies in Conservation, No 25. 1980 pp165 - 175.

MONCRIEFF, A., Problems and Potentialities in the Conservation of Vitreous Materials. Conservation in Archeology and the Applied Arts. IIC. 1975. pp 99 - 104.

NEWTON, R.G., The Deterioration and Conservation of Stained Glass: A Critical Bibliography. OUP. 1982.

NEWTON, R.G., Current Problems in the Conservation of Stained Glass. Conservation Paper 7. CAC. 1977.

NEWTON, R.G., Conservation of Medieval Windows. Conservation in Archeology and the Applied Arts. IIC. 1973. pp 93 - 97.

ROYCE - ROLL, D., Colour of Medieval Glass. Stained Glass Magazine, Vol 78 No 2, Summer 1983.

TECHNICAL COMMITTEE OF THE CORPUS VITREARUM; CV News Letter, Number 1 (1972) onwards.

TERWEN, P., The Mending of Stained Glass; A Technical Instruction. Preprints SSCR Edinburgh. 1982. pp 11-1 to 11-5.

WEINTRAUB, S., GREENLAND, M., Field Application of the Stained Glass Conservation Techniques. (Part 11). Adhesives and Consolidants, IIC Paris 1984. pp 199 - 201.

WOLFF, A., The Conservation of Medieval Stained Glass to the Jacobi method of Lamentation used at Cologne. Conservation in Archeology and the Applied Arts. IIC. 1973. pp 115 - 117.

## CONSERVATION/ADHESIVES.

DAVISON,S., A Review of Adhesives and Consolidants used in Glass Antiquities. Adhesives and Consolidants. IIC,Paris.1984 pp 191-194.

DOWN,J.L.,The Yellowing of Epoxy Resin Adhesive;Report on Natural Dark Aging. Studies in Conservation No 29.1984. pp 63-76.

DOWN,J.L., The Yellowing of Epoxy Resin Adhesives;Report on High-Intensity Light Aging. Studies in Conservation, No 31.1986. pp159 -170.

JACKSON,P.R. Resins used in Glass Conservation . Preprints SSCR Edinburgh.1982. pp 10-1 to 10-7.

TENNENT,N.H., Clear and Pigmented Epoxy Resins for Stained Glass Conservation;Light Aging Studies. Studies in Conservation,24 (1979),pp 153 - 164.

TENNENT,N.H & TOWNSEND,J.H., The Significance of the Refractive Index of Adhesives for Glass Repair. Adhesives and Consolidants IIC,Paris 1984.pp 205 - 212.

CONSERVATION/CONSOLIDANTS.

ERRIT, R.F., LYN, M., BRILL, R.H., The use of Silanes in Glass Conservation, Adhesives and Consolidants, IIC Paris, 1984. pp185-190.

NEWTON, R.G. What do we really know about Protective Coatings?. Preprints 8th Triennial Meeting, ICOM. 1972 pp1009 - 1012.

WIENSTRAUB S., GREENLAND M Field Application of Stained Glass Conservation Techniques (Part 1 ) Adhesives and Consolidants, IIC Paris, 1984 pp 199 - 207.



CONSERVATION/LEAD.

ANON., Ancient Leads for Windows and the Methods of their Manufacture. Journal of British Society of Master Glass-Painters, Vol 111, No 3, 1930.

BROWN, S.L., The Structure of Lead as Related to Stained Glass. Journal of British Society of Master Glass-Painters, Vol 11, No 3, 1928.

CANNON, L., Lead Milling Marks for a Seventeenth Century Window. Stained Glass Journal, SGAA, Fall 1988.

DENEUX, A.A., A Thirteenth Century Mould for Making Lead Comes. Journal of British Society of Master Glass-Painters, Vol 111, No 2, 1929.

KNIGHT, DR, B., Window Lead can be Interesting. Conservation News. No 29. 1986. pp 31 - 32.

KNIGHT, DR, B., Researches on Medieval Window Leads. Journal of British Society of Master Glass-Painters, Vol XV111, No 1, 1983 -4

# Laminated Glass Protection

The small congregation of St. Joseph's Episcopal Church received an early Christmas present last December.

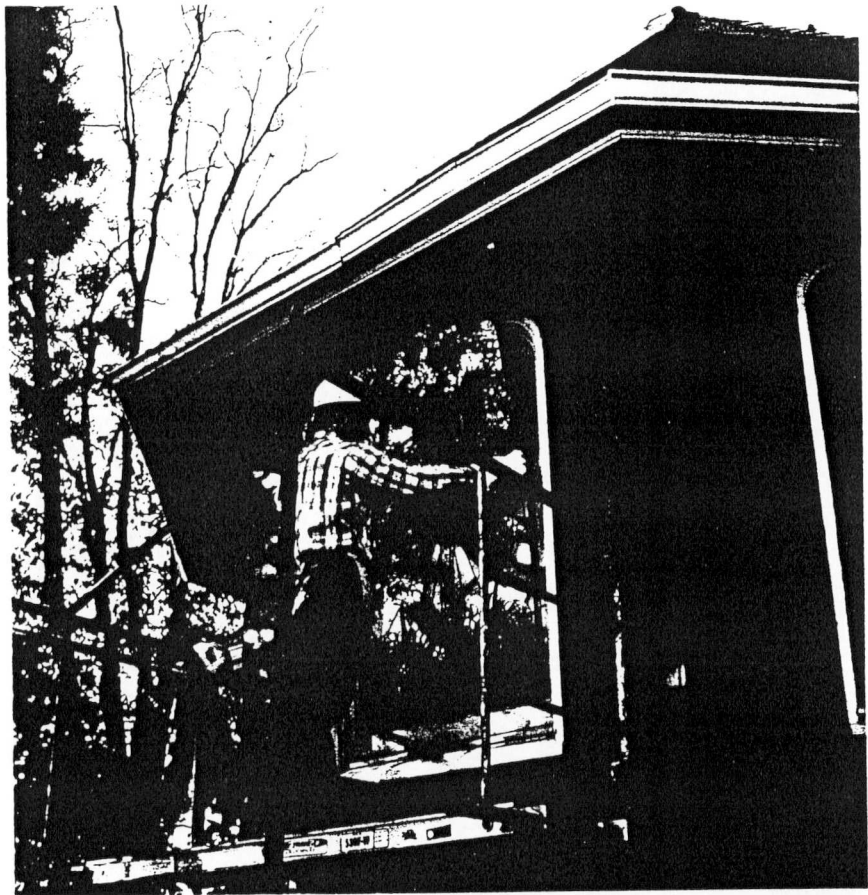
The treasured stained glass windows of St. Joseph's were restored and preserved for the church and future generations through the efforts of the Du Pont Company's Fayetteville, NC works and SGAA member studio, Stained Glass Associates.

The 90 year old set of five "Resurrection" windows are one of the last sets installed by Tiffany and Co., according to historical accounts.

"The restoration coincided with Du Pont's celebration of the 50th anniversary of *Butacite* and a \$30 million expansion at our Fayetteville plant," said Jack McAndrews, Du Pont vice president, automotive products. "We are adding to our capacity for producing *Butacite*, a polyvinyl butyral (PVB) sheeting used in the production of laminated safety glass, so it's only appropriate that after restoration, these valuable church windows will then be protected from possible vandalism by installing laminated safety glass on the side facing the street."

Laminated safety glass was developed for automotive windshields 50 years ago to help resist shattering and penetration, he said. Today it is a leading construction material as well. Current applications range from skylights and atrium ceilings, to uses in banks and retail display cases, to the futuristic United Airlines terminal at Chicago's O'Hare Airport.

St. Joseph's Church was built in 1896, as a gift of Mrs. Eva Cochran of New York to Fayetteville's black Episcopalian community. It is said to be a replica of her home church in Great Britain. The small, shingled frame structure, listed in the National Register of Historic Sites, has always been painted a distinctive dark, rich green color. Its Queen Anne style architecture, including arched arcades to the accessory buildings, creates the effect of an English village.

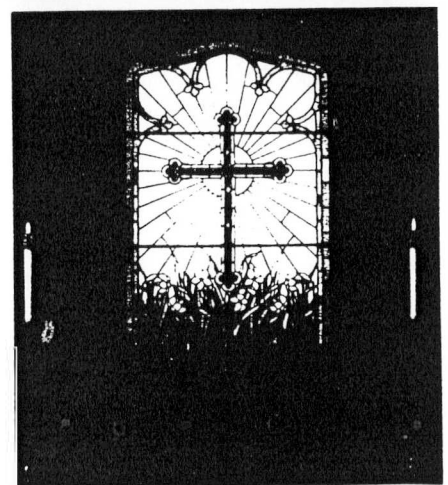


Gordon H. Schenck, Jr.

**INSTALLING LAMINATED GLASS**—Timothy Wysocki of Stained Glass Associates installs laminated glass as protection over a Tiffany Window at St. Joseph's Episcopal Church, Fayetteville, North Carolina.

The Tiffany windows are located in a half-circle in the chancel area of the church. Measuring approximately 38 inches wide by 65 inches high, the windows have small Tudor peaks at the top. The center window depicts a jewelled cross and the side windows include symbolic designs and lillies.

Restoration of the windows was handled by Robert J. Wysocki of Stained Glass Associates of Raleigh, NC. The operations included careful cleaning and flattening of the windows which had developed severe bulging over the years. □



G. H. Schenck, Jr.

**JEWELLED TIFFANY**—window, believed to be one of the studio's last commissions, now restored and protected with laminated glass through the efforts of the Du Pont Fayetteville Works.

## APPENDIX 18

### STATEMENT ON PROTECTIVE GLAZING RAGUIN ASSOCIATES INC.

Virginia Raguin, President, Gerald Farrell Jr., Vice President  
280 Boston Avenue, Medford, MA 02155 (617) 391-5793

### THE MAINTENANCE AND RESTORATION OF STAINED GLASS IS AN AREA UNUSUALLY PRONE TO MISINFORMATION AND MISGUIDED EFFORTS.

Most owners of buildings are accustomed to issues of furnace, roof, or window repair because these are aspects common to all buildings. A caretaker of stained glass may, in all likelihood, be faced with decisions about the care of windows for the first (and last) time. This makes decisions very hard since there is literally no way of learning from experience. It is important for caretakers of stained glass to come together and to pool resources and experiences. Before going outside to costly consultations in the "for-profit" world, use your own resources, study, compare notes, link arms, and be prepared to make yourself into the most exacting client possible. Protective glazing is a particularly troublesome issue.

1. Protective Glazing is not always a wise or cost-effective decision for the owner of stained glass windows. High-quality restorations often have chosen not to install protective glazing. For example, in the restoration of Harvard University's Memorial Hall most of the windows do not use project protective glazing. Harvard's windows include traditional European windows that use standard leading systems, painted interior surfaces, and a single thickness of glass. The Hall also includes highly complex opalescent-style windows by La Farge, Whitman, and Tiffany that containing several plated layers, innovative leading, and varying thickness and shapes of the glass.

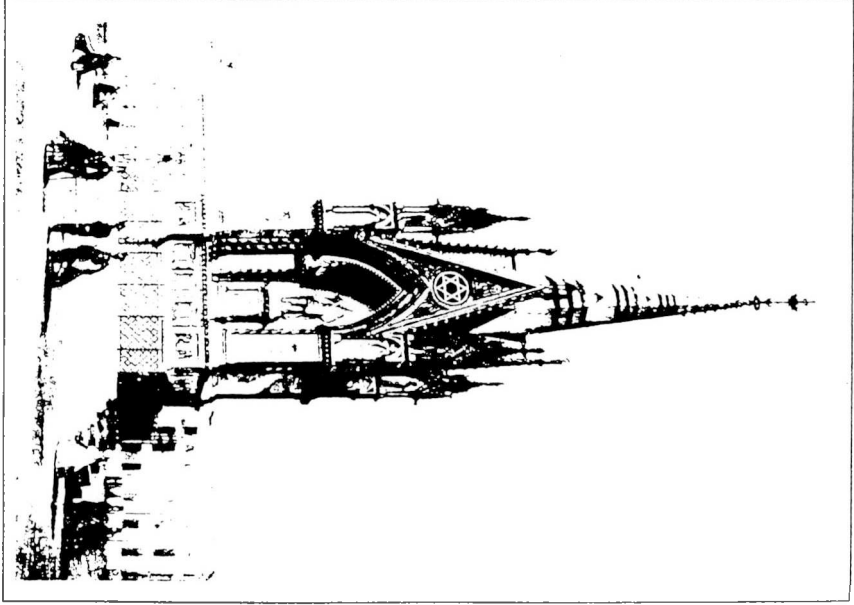
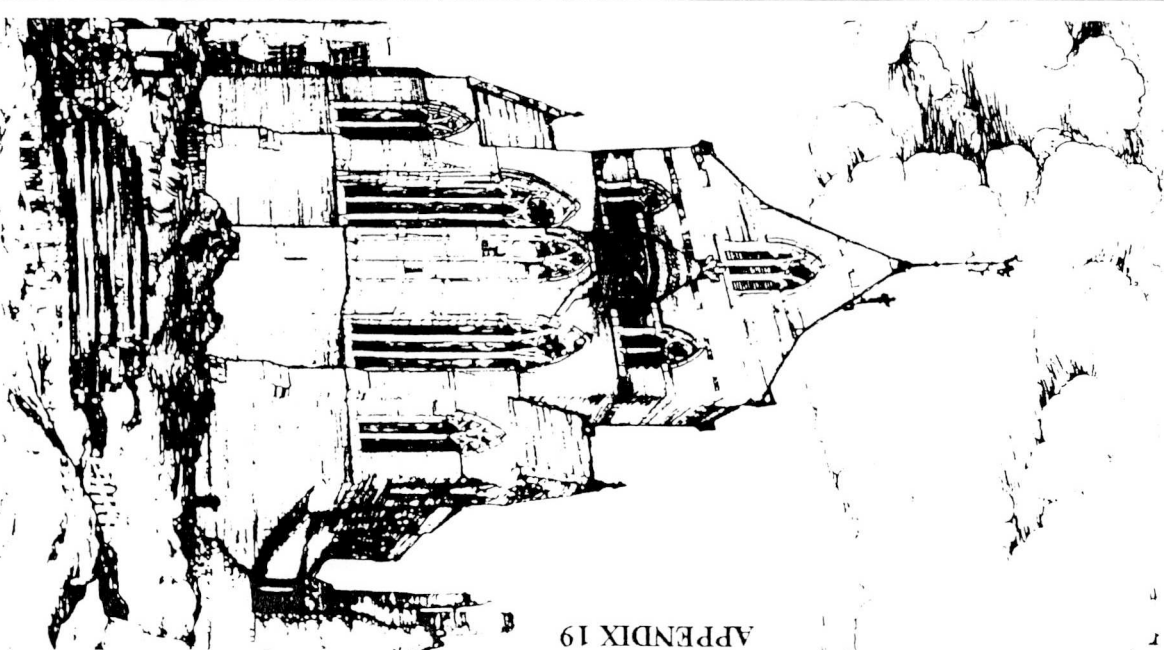
2. Protective Glazing, properly installed, is not necessarily heat or energy saving. In order to preserve the leaded window, the protective glazing **MUST HAVE AN AIR FLOW BETWEEN THE STAINED GLASS AND THE EXTERNAL GLAZING**. There must be venting at the top and bottom of the window to permit the passage of air and moisture. If the protective glazing is not vented, it will allow condensation **WHICH WILL DESTROY THE LEAD CAMES AND ATTACK THE SURFACE OF THE GLASS IN THE SPACE OF A VERY FEW YEARS**. Beware especially, plastic sheeting fasted to the exterior with screws and caulked tight with silicone. It is possible to destroy stained glass by installing poorly designed "protective glazing" more quickly than by leaving it alone.

3. Stained glass restoration and installation of protective glazing are two entirely different crafts. There is a very serious question as to whether these two crafts should be handled by the same studio. Owner or caretakers of a building, reasonably, should deal with the most experienced professionals for any building need. Certainly this would mean as a first step, demanding that a "restorer" define clearly the costs of restoration between the stained glass itself and the design and installation of protective glazing. It may even be more prudent to employ a separate firm, one which specializes in this field, for the protective glazing. Perhaps an owner should look for separate bids on this issue, asking companies to describe the comparative values of lexan or glass. There are new glass products being used in Europe that should be investigated. In addition, if a local firm can be found to handle the protective glazing (whoever restores the windows themselves) the owner may have great advantages in accountability and maintenance.

4. If you have installations of the unvented type, **IMMEDIATELY** consult an architect or a reputable stained glass studio to determine how you can pierce vents in the glazing to create a flow of air. It should not be necessary in most cases to remove the external glazing if it can be redesigned in place.

# THE VICTORIAN SOCIETY

APPENDIX 19



Albert Memorial, Manchester

## THE VICTORIAN SOCIETY IN AMERICA SUMMER SCHOOL

The Summer School in London is sponsored jointly by the Victorian Society and the Victorian Society in America, which also runs its own Summer School in the United States. In 1994, this School will run from June 3rd - 12th, and will be based in Newport, Rhode Island, the "queen" of American resorts. The course includes lectures, visits to private houses and tours of Newport and nearby areas including Boston, Mass., to study architecture, city planning, landscape gardening, transport and the decorative and fine arts of the 19th century. The course director is the architectural historian and Professor at the University of Virginia, Richard Guy Wilson.

For further details of this Summer School, please contact the Victorian Society in America, 219 South 6th Street, Philadelphia, PA 19106, U.S.A. Tel: (215) 627 4252. A limited number of scholarships are also available for

## THE VICTORIAN SOCIETY SUMMER SCHOOL APPLICATION FORM

DATE

SURNAME

TITLE  INITIALS

ADDRESS

POST/ZIP CODE

TELEPHONE Day  Evening

Fax No

Indicate Residential/Non-Residential

Please return this form with your curriculum vitae, providing details of your interest in 19th century studies and how you heard of the Summer School. Please arrange for two references to be sent to the Society by suitably qualified persons. If you are unable to attend the Summer School unless given a financial or partial scholarship, it is essential that you state this in your letter and explain the circumstances. Please ask your referees to confirm your need for financial assistance. A deposit of £500 for residential and £300 non-residential is payable on acceptance.

All correspondence and enquiries to:  
Meg Birney, Summer School Secretary,  
The Victorian Society, 1 Priory Garden,  
Bedford Park, London W4 1TT. Tel: 08  
994 1019. Fax: 081-995 4895.

The Victorian Society's 20th annual Summer School is based in London and includes visits to other parts of England. The School is designed to provide a comprehensive survey of Victorian and Edwardian architecture and also deals with other associated areas of interest such as the decorative arts and fine arts, interior decoration and design. The history and growth of Victorian London are studied as are the problems associated with the preservation and restoration of historic buildings of the period. In addition to lectures by experts in their fields, the School involves visits to some of the finest examples of architecture and interior decoration of the period 1830-1914, many of which are private and not normally open to the public.

## LECTURES

The lecture subjects cover the problems of style in Victorian architecture, the Classical tradition and the Gothic Revival, church, country house and railway architecture, social housing and town planning, the history of Victorian London and Victorian civic architecture, the Aesthetic Movement and the Arts & Crafts movement, the Garden Suburb and the Victorian pub, architectural sculpture and decoration and interior design.

Lecturers and guides include David Walkin, Alan Crawford, Andrew Saint, Clive Wainwright, John Brandon-Jones, Alan Powers, Andrew Sanders, Ian Grant, Hermione Hobhouse, Deborah Lambert, Paul Ancherbury, Robert Thorne, Roderick Gradidge, Dr. Chris Brooks, Roger Bowdler, Jessica Rutherford, Margaret Richardson, Eilam Harwood, John Vaughan, Clare Hartwell, Sandra Martin, Peter Howell, Teresa Sladen and Kit Wedd.

## VISITS

Important London buildings and areas visited include the New Palace of Westminster (the Houses of Parliament), the Foreign Office, the Royal Courts of Justice, the Reform Club, St Pancras and King's Cross Stations, All Saints' Church Margaret Street, Westminster Cathedral, Leighton House, Linley Sambourne House, Sir John Soane's Museum, the Victoria & Albert Museum, South Kensington, "Queen Anne" Chelsea, Bedford Park and Hampstead Garden Suburb.

Places visited outside London include Oxford and Brighton together with a tour of 1890s houses in Surrey by Lutyens, Voysey and other important architects. Houses seen include the Red House at Bexleyheath, Girtin's Dyke, Standen and Munstead Wood. The long weekend away from London involves one night in Birmingham and three in Liverpool to tour the Midlands and the North West. This tour includes visits to several important collections of Victorian paintings, notably Birmingham City Art Gallery, Manchester City Art Gallery and the Lady Lever Gallery at Port Sunlight, as well as major monuments such as Alton Towers, St Giles' Church Cheshire, Manchester

The return journey from Liverpool incorporates visits to Ironbridge Gorge and Wighwick Manor.

Architects whose work is studied and seen include Sir Charles Barry and A.W.N. Pugin, C.R. Cockerell, Harvey Lonsdale Elmes, Sir George Gilbert Scott, William Butterfield and G.E. Street, William Burges, Alfred Waterhouse and J.L. Pearson, G.F. Bodley, Richard Norman Shaw, Philip Webb, C.F.A. Voysey and Sir Edwin Lutyens, Lanchester and Rickards, Fletcher and Joass and Sir Giles Gilbert Scott.

## LOCATION

The Summer School is based at Canterbury Hall, Cartwright Gardens, London WC1, a university hall of residence in Bloomsbury near both the British Museum and St Pancras Station. Lectures are held at the Building Centre in Sore Street.

## ORGANISATION

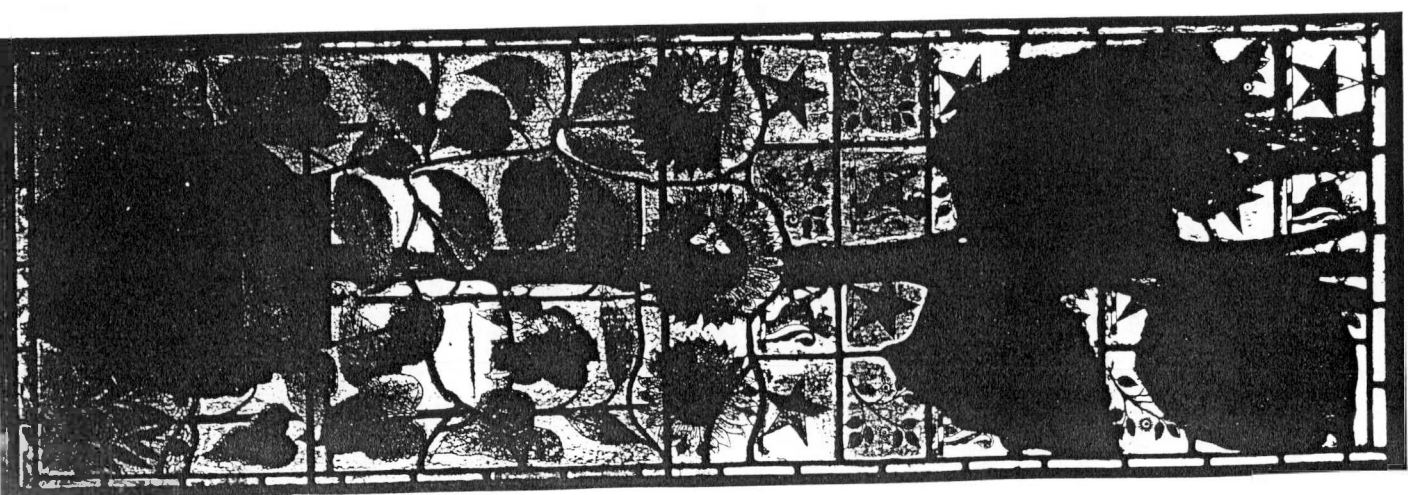
The Director of the Summer School is Gavin Stamp, M.A., Ph.D. (Canab.), the architectural historian and writer whose publications include *The Great Perspectivists*, *The Changing Metropolis*, *The English House 1860-1914* and *Telephone Boxes*. The Assistant Director is Maria Galicki, M.A.

The Summer School is organised by the Victorian Society, the national society responsible for the study and protection of Victorian and Edwardian architecture and other arts. The Society was founded in 1958 and is registered as a charity. The Patron is H.R.H. The Duke of Gloucester, the President is Lord Briggs of Lewes, and the Chairman, Dr. Chris Brooks. The Society's headquarters is at 1 Priory Gardens, Bedford Park, London W4 1TT, telephone 081-994 1019.

## TUITION

The fee for the full programme, which runs from the evening of Saturday, July 2nd until the morning of Saturday, July 23rd, is £1350. This includes bed and breakfast in London as well as all entrance fees and coach transport. Dinner and some lunches will be provided only during the long weekend away from London. The fee for attending the School without using the accommodation in London but including the accommodation during the weekends away from London is £900.

The programme is specifically aimed at architectural historians and architects, students of the visual arts of the 19th century, museum curators and those involved with the preservation of the 19th century buildings but is also intended for anyone with a serious interest in the art and architecture of Victorian and Edwardian Britain. A limited number of scholarships are available for suitable candidates with no other means of sponsorship. Closing date for applications:



Window from Linley Sambourne House, 18 Stafford Terrace, London

## APPENDIX 20

### List of Contacts

**Robert J Wysocki**

Stained Glass Associates  
PO Box 1531  
Raleigh  
North Carolina 27602

**Susanne Frantz**

Curator of Twentieth Century Glass  
The Corning Museum of Glass  
Corning New York 14831

also

**Dr Stephen Koob**, Conservator

**Ms Norma Jenkins**, Head Librarian

**Virginia Wright**, Reference Librarian

**Dr Robert Brill**, Research Scientist

**Dr Virginia Raguin**

Associate Professor, Department of Visual Arts  
College of the Holy Cross  
Worcester  
MA 01610  
USA

**Dr William Filmer-Sankey**, Director

The Victorian Society  
1 Priory Gardens  
Bedford Park  
London W4 1TT  
UK

**David Reekie**

48 Earlham Green Lane  
Norwich NR5 8HE  
Norfolk UK

**Dr Jane Hayward**, Curator of Stained Glass

The Cloisters  
The Metropolitan Museum of Art  
Fort Tryon Park  
New York NY 10040

**Mary Clerkin Higgins**

Stained Glass Conservation  
1 Washington Square Village #15E  
New York New York 10012

**Ms Jennifer Opie**  
Victoria & Albert Museum  
Cromwell Road  
London SW7 2RL  
UK

and also

**Michael Archer**, Keeper  
**Agnes Holden**, Head of Stained Glass Conservation  
**Samantha Whitney**, Conservator  
**Drew Anderson**, Conservator

**Mr John Lawson**, Chief Artist  
Goddard & Gibbs Studios Ltd  
41-49 Knightsland Road  
London E2 8AD

**Debora Coombs**  
6 Mentone Terrace  
Hackney  
London E8 3PN

**Chapel Studio**  
Bridge Road  
Hunton Bridge  
King's Langley  
Herts. WD4 8RE

**Ed Scott**, Secretary  
The British Society of Master Glass-Painters  
11 Lansdown Road  
Muswell Hill  
London N10 2AX

**Morris & Juliet Venables**  
Antiquarian and Secondhand Books  
Rose Bank  
270 Henbury Road  
Bristol BS10 7QR

**Roy W Coomber**  
39 Vicarage Road  
Bishopsworth  
Bristol BS13 8ER

**Mr Peter Gibson**, Superintendent  
The York Glaziers' Trust  
York Minster  
Minster Yard  
York

**Dr Sebastian Strobl**, Director  
The Cathedral Studios  
8 The Precincts  
Canterbury CT1 2EG

Royal College of Art  
**Alan Cummings**, Course Leader  
RCA/V&A Conservation Courses  
Kensington Gore  
London SW7 2EU

Graduate School of Architecture  
Planning and Preservation  
Columbia University  
400 Avery Hall  
New York NY 10027

The Conservation Center of the Institute of Fine Arts, New York University  
**Margaret Holben Ellis**, Chairman  
14 East 78th Street  
New York NY 10021

Art Conservation Department  
**F Christopher Tahk**, Director  
State University at Buffalo  
1300 Elmwood Avenue  
Buffalo NY 14222

American Institute for Conservation of Historic and Artistic Works (AIC)  
1717 K Street, NW  
Suite 301  
Washington, DC 20006

**Professor Marie-Francoise Dromigny**  
L'Ecole Nationale Supérieure Metiers d'Art et Arts Appliqués  
4 Jules Chaplain  
75006 Paris

**Jean-Marie Bettembourg**, Head  
Laboratory of the Landmark Buildings of France  
Chateau de Champs sur Marne  
Avenue de Paris  
77420 Champs sur Marne

**M. J-F Lagier**, Directeur  
Le Centre International du Vitrail  
5, rue du Cardinal Pie  
F - 28000 Chartres



## **APPENDIX 21**

### **Churches and Cathedrals**

Although the primary purpose of this study tour has been the gathering of knowledge on conservation issues and processes from individuals and organisations, I have had the opportunity to see the results of restoration, and sometimes the need for restoration, in numbers of churches, cathedrals and other sites.

#### **United States of America**

Boston, Church of the Covenant  
Boston, Church of the Advent  
Boston, Emmanuel Church, Newbury Street  
Boston, The Old South Church  
Boston, Trinity Church  
Cambridge, Massachusetts, Congregational Church  
Cambridge, Massachusetts, Harvard Memorial Hall  
Durham, Duke University Chapel  
Raleigh, Bethlehem Baptist Church  
Raleigh, First Baptist Church  
Raleigh, First Presbyterian Church  
Raleigh, St Peter's Episcopalian Church  
New York, Church of St Thomas  
New York, St Patrick's Catholic Cathedral  
New York, St Vincent Ferrer Catholic Church  
Washington National Cathedral

#### **United Kingdom**

Blickling, Norfolk, St Andrew's Church  
Brisley, Norfolk, St Batholomew's Church  
Bristol Anglican Cathedral  
Canterbury, Cathedral  
Canterbury, St Augustine's Abbey  
Canterbury, St Martin's Church  
Canterbury, St Thomas' Catholic Church  
Cawston, Norfolk St Agnes' Church  
Coventry Anglican Cathedral  
Gloucester Anglican Cathedral  
Norwich, Catholic Cathedral Church of St John the Baptist  
Norwich, Church of England Cathedral  
Rusper, Parish Church of St Mary Magdalene  
Selby, Abbey Church of St Germain  
Tudeley-Cum-Capel, Kent All Saints' Church  
York Minster  
York, Church of St Helens

## **France**

Chartres, Notre Dame Cathedral  
Paris, The Sainte-Chapelle  
Paris, Notre Dame  
Paris, S. Madeleine  
Paris, Ste Odile  
Paris, St Eustache at Forum Les Halles

## **Museums and Galleries**

### **United States of America**

Boston, Museum of Fine Arts  
Corning, Glass Museum  
New York, The Cloisters annexe of the Metropolitan Museum  
New York, Metropolitan Museum of New York  
New York, Solomon Guggenheim Museum

### **United Kingdom**

London, British Museum  
London, Sir John Soane's House  
London, Victoria and Albert Museum of Decorative Arts  
Norwich, Arts Centre  
Norwich, Sainsbury Centre, University of East Anglia

## **France**

Paris, Le Louvre  
Paris, Musee d'Orsay