

AN
CHOMHAIRLE
OIDHREACHTA



THE
HERITAGE
COUNCIL

the care
of STAINED
GLASS



Myshall Church of Ireland Church, Co. Carlow was built by George Ashlin. It received grant-aid from the Heritage Council towards the cost of protecting the windows with stainless-steel wire-guards. The windows, by James Powell & Sons, had previously been unprotected.



Ballisodare Church of Ireland Church, Co. Sligo. Rare window of 1862 by Thomas Willement.



Abbeyleix Church of Ireland Church, Co. Laois was built by Thomas Wyatt and many of the windows are by Henry Holiday. It received grant-aid from the Heritage Council towards the cost of removing the secondary glazing and replacing it with stainless-steel wire-guards.

Contents

Introduction

Acknowledgements

Section 1

Advice to all Custodians of Stained Glass 1

Section 2

Recommendations to Stained Glass Conservators 9

Section 3

The Protection of Stained Glass Against Damage 15

Section 4

Making a Photographic Record 21

Section 5

Useful References 25

Written on behalf of the Heritage Council by Dr. David Lawrence.

This booklet is dedicated to the memory of Mr Ralph Wood (1933 - 2001), ecclesiastical architect, who took exemplary care of the stained glass in the churches for which he was responsible.

Cover: Stained glass of 1913 by Mayer & Co. of Munich at St. Mullin's Church, Timolin, Co. Kildare.



Introduction

Ireland has a rich legacy of stained glass. Fine examples of the art can be found in public and private buildings across the country, but mainly in our churches. The work of some of the finest European, English and Irish artists graces great cathedrals, historic buildings and humble churches.

This booklet is intended as a guide for the custodians of these treasures, to assist them in their care and conservation.

Dr Tom O'Dwyer
Chairperson of the Heritage Council

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Chief Executive

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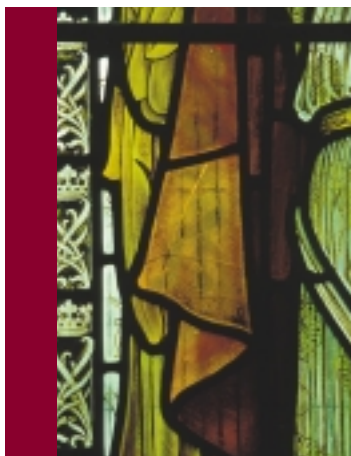
Richard Kimball

Photography: *Photographs on pages 5,6,7 & 8 by Richard Kimball.
All others by David Lawrence.*

*Left: Stained glass of 1903 by William Francis Dixon, made by Mayer & Co. of
Munich at St. Mary's Church, Dungarvan, Co. Waterford.*

Section One Advice to all custodians of stained glass

Glass, by its nature, is likely to break! This cracked piece of glass is causing no problems and should remain unrepaired. If the window should eventually be removed to the studio and restored, then the cracks can be repaired using one of the modern techniques of conservation. Under no circumstances should glass with simple cracks be replaced with new.



The underlying principle of conservation The most important principle underlying the conservation of stained glass is that of *minimal intervention*. This principle is based on good conservation practice which aims to respect and retain existing fabric and intervene only when absolutely necessary.

The avoidance of unnecessary work There is a tendency to worry unduly about the condition of stained glass windows. People often think that a window is “about to fall out”; moreover that this will happen in a church “during a religious ceremony”! In the case of the majority of stained glass windows in this country, no repair or maintenance work is required. Moreover where work is required, there is seldom any great urgency. Normally a period of five years will not contribute significantly to the deterioration and will give the parish time (a) to trace a suitably qualified conservator, (b) to obtain the necessary permissions and (c) to raise the funds required.

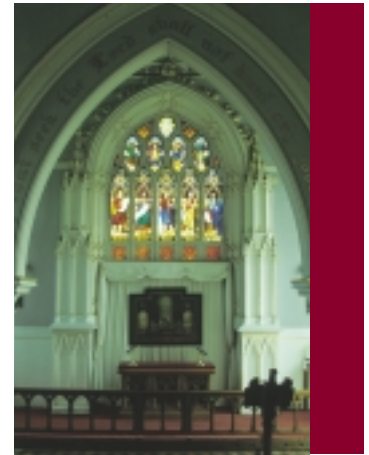
One frequent area of concern is where a window is buckled (i.e. distorted from the vertical plane). In many cases buckled windows do not require any attention other than annual monitoring. Buckling in itself is not an indication for the major step of re-leading. If strong and stable, a window can remain buckled without problems for decades. Windows from the early twentieth-century Dublin studio An Túr Gloine are particularly prone to premature buckling, but they might often remain happily in a buckled state for many years to come. Sometimes, when the expensive and possibly unnecessary step of re-leading has been undertaken, the buckling has re-appeared within a few years.

Another cause for concern can be the existence of damaged pieces of glass within a window. But damaged glass, in many cases is best left unrepaired; cracks can remain as cracks and small holes can be filed *in situ* with putty or lead.

Cases where conservation work is required Having made the general point about avoiding unnecessary work, it must be said that there are, of course, exceptions and, indeed, a few extreme cases have come to light where immediate action has had to be taken to rescue a window in a precarious state of disrepair. More commonly, there are cases which lack that degree of urgency but where the condition of a window is such that intervention is desirable. The level of intervention could range from attending to a small area whilst the window remains in position, to complete removal, dismantling, remaking and re-fixing. Major works could be indicated (a) where the structure is so weak that movement is causing glass to break, or (b) where the lead and/or putty have degenerated to the point that there is significant ingress of rain-water, or (c) where there has been significant damage to pieces of glass, either accidentally or deliberately inflicted.

If it is decided that there is no alternative but to remove and remake a window, it must be understood that this is not a trivial procedure. Moreover, it is one which may require planning permission. A stained-glass window is not a picture hanging on a wall, but an integral part of the structure of an historic building. Its temporary removal is a major step to take and can be traumatic, risking damage to the stained glass and the building. It must be undertaken with extreme care and only by the most skilled and experienced of craftsmen. If correct methods and tools are used, the glass should suffer no further damage during any part of the process. Where new lead is introduced, the profiles should be selected so as to match precisely to the originals.

Approaches to the problem of damaged glass When a window has been removed to the studio, there are several possible procedures for dealing with damaged glass and these are discussed in Section Two. Wherever possible, the damaged pieces of original glass should be repaired using one of the modern techniques of conservation. As a general principle, the replacement of original glass with new should be very seldom done. Only where there is absolutely no alternative should this drastic step be taken and then only by the most skilled and experienced of glass-painters. The ability to draw and paint pieces of glass



Although there is seldom any urgency to deal with the maintenance of a stained-glass window, there are some exceptional cases where the leaded structure is in perilous condition and literally moving in the air. If such a window is to survive, immediate steps must be taken temporarily to remove and store it in crates until funding can be found for a thorough programme of conservation. Such a case was this rare window of 1817 by Joshua Bradley of Dublin.

Following a breakage, it is vital to collect and store all the broken fragments of glass and lead. Much can be repaired and put back.



to match the styles of work of nineteenth and twentieth century studios is a rare skill. Sadly, where the work is attempted by an artist without this ability, the result can be very unlike the original artist's work and the window is gravely disfigured. The colour, drawing, shading and execution often bear very little resemblance to the original and it would have been far better to leave the window in its damaged state. No one would think of making alterations or additions to an oil painting and the same principle should apply to works of art in stained glass. The inclusion of new glass-painting, no matter how well executed, will invariably devalue an original work of art.

Returning the window to the building The re-fixing of a restored window into the building must be carefully and skilfully carried out. Suitable protection to floors, walls, organs, etc. should be put in place before the work begins. Stained glass is a structural part of the building and impinges on other specialities. The re-fixing of the glass might very well also involve a sympathetic understanding of stonework, brickwork, woodwork or ironwork. The advice of a suitably qualified architect should be sought and the custodians or owners should insist on the correct materials, for example the use of non-ferrous metal for supporting bars. All too often, one sees examples of incorrect materials and careless craftsmanship, such as clumsily-applied putty or synthetic mastics where there should be neat pointing in a lime-based mortar.

The unique role of owners and church officers in the conservation of stained glass All owners, and in particular, churchwardens, priests and other custodians are in a unique position to play a vital role in the conservation of stained glass, in two quite distinct ways.

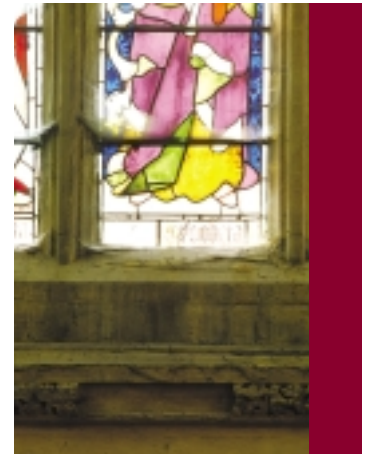
Firstly, following a breakage, if the fragments of broken glass are collected and saved, both from inside and outside of the window, then there is a good chance that the stained-glass studio will be able to repair and put back the original pieces of glass. If the damage is too bad for that to be done, the damaged fragments nevertheless provide vital information for an accurate reconstruction

to be made. In collecting fragments, a record should be made of the location where the fragments were found in order to help identify their origin. Photographs of the location of the fragments can be particularly useful in this regard.

Secondly, it is immensely valuable if the owners can arrange for the windows to be photographed before any damage occurs. Repair to a damaged window can be far more faithful if a good-quality photograph of the window exists. Insurance companies are increasingly recommending photography and it could in the future become a condition of providing insurance cover. Photography is discussed in Section Four of this booklet.

Cleaning Unless a window is fitted with external secondary glazing, the exterior surface is normally kept clean by natural means. On the other hand, the interior surface is often very dirty indeed and the appearance of the window is compromised. A great improvement can be had by light brushing with a soft, dry brush, possibly combined with vacuuming, but care should be taken to avoid using hard implements.

Ingrained dirt can also often be removed by a similar method, but this should not be undertaken, unless a stained glass conservator has first established that the glass-paint (e.g. details of lines, shading, lettering) is stable. Glass-paint would ideally always be stable but sometimes, due to poor kiln-firing, it may have lost some of its original intensity. In this case anything other than light brushing can result in further loss of painted detail. If the glass paint is friable or flaking, no cleaning or brushing of any kind should be undertaken, as this would result in the loss of detail.



The interior surfaces of many windows would benefit from cleaning. Certainly, the appearance of a window is transformed if the cobwebs are removed with a vacuum-cleaner. However, if the dirt is ingrained, cleaning is a job for the specialist, who must first ensure that the glass-paint is stable. This is part of an historic window by Pugin in a church in England. In a notorious case in the 1990s, the window was permanently removed. Under the Planning Law in Ireland it is extremely unlikely that permission would be granted to remove a window permanently from a building.



Detail to damage to window at St. Michael's Church, Ballina, Co. Mayo. Glass damaged in this way must not be replaced with a replica. It should either be left or repaired, thereby preserving the artist's original work.

Complying with the law It is the duty both of the stained glass studio, the owners and their professional advisors to comply with current legislation so far as work to stained glass windows are concerned.

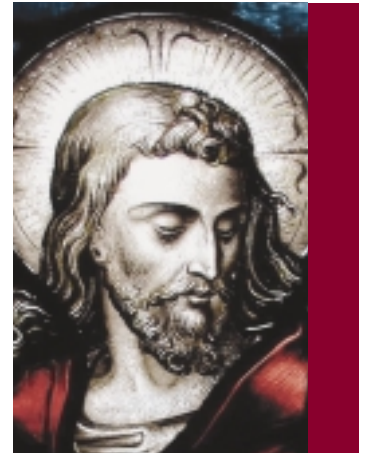
The Planning and Development Act, 2000 provides *inter alia* for the protection of the architectural heritage, and obliges planning authorities to maintain a Record of Protected Structures (RPS). Part IV of the Act deals with architectural heritage.

In the Act, 'works' include "*any act or operation of construction, excavation, demolition, extension, alteration, repair or renewal*", and in relation to a protected structure or proposed protected structure, the definition includes "*any act or operation involving the application or removal of plaster, paint, wallpaper, tiles or other material to or from the surfaces of the interior or exterior of a structure*". Therefore, many works which would be considered exempted development for ordinary buildings will require planning permission if they would materially affect the character of a protected structure or a proposed protected structure.

Since most buildings containing historic stained glass are more likely than not to be listed on the Record of Protected Structures (RPS), it is essential that the owners, custodians, conservators and/or architectural advisors ensure that the provisions of the Act are complied with. This may mean obtaining planning permission for works to a stained glass window, or possibly seeking a Declaration from the planning authority under Section 57 of the Act that the proposed works are exempted development within the meaning of the Act. In particular, care should be taken that windows are not removed for assessment, safety or storage, prior to the receipt of planning permission or a Declaration. It will be important to keep the local authority conservation officer informed of any proposals to carry out works. External protection for stained glass windows will also be subject to planning permission as explained in Section Three.

In the draft Achitectural Heritage Protection Guidelines for Planning Authorities, published jointly by the Department of Arts, Heritage, Gaeltacht and the Islands and the Department of the Environment and Local Government, particular reference is made to stained glass, decorative zinc-framed or leaded glass:

“Where old or interesting glass has been identified in a protected structure or in another historic building, the planning authority should ensure that such glass is retained and protected during the building works. The planning authority should be aware that the repair and cleaning of artistically or historically important glazing, such as stained glass panels, is the work of specialist conservators. The repair of leaded-glass panels should preferably be carried out in situ. However, there may be cases where serious problems warrant the removal of the panel to a workshop off site for repair. The planning authority should require that, before any works are carried out, the window be recorded in situ with photographs, drawings or both.”



Detail of Ballina window following conservation, involving resin-bonding and the re-instatement of damaged glass-paint.

Summary of advice to custodians



*Parish Church, Co. Laois. Late C17
Netherlandish Glass depicting St. John
the Evangelist. Detail, showing damage
prior to conservation.*

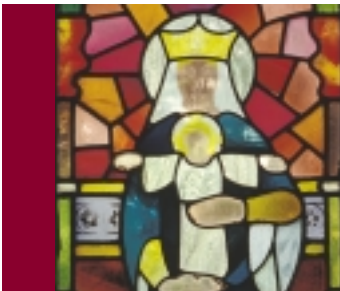
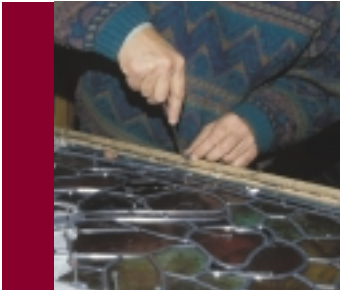
- Only work which is absolutely necessary should be carried out.
- Buckling of leaded panels does not necessarily mean that the window should be re-leaded.
- Damaged glass can often be left unrepaired.
- A method-statement and specification should always be requested from the studio and this must be approved by the Heritage Council if the project is being considered for grant assistance. It is important to make sure that the studio intends to record all repairs and interventions before, during and after the work.
- The original artist's work and the original fabric must be respected and preserved wherever possible.
- Only in exceptional circumstances should new glass be introduced and the work must be entrusted only to highly-skilled and knowledgeable glass-painters.
- Following criminal or accidental damage, the broken fragments should be collected and stored.
- A photographic record of all the stained-glass windows is invaluable.
- Anything other than superficial cleaning should only be undertaken by a specialist.
- The most satisfactory form of protection against vandalism is to fix stainless-steel wire-guards.
- No work, however minor, should proceed without consulting the local planning authority and window-guards are also subject to planning permission.

*Right: Stained glass of 1934 by the well-known Dublin artist, Evie Hone,
at St. Nahi Church, Taney, Dundrum, Dublin*



Section Two Recommendations to stained glass conservators

Re-leading should not be seen as routine and should be undertaken only where there is no alternative. New lead comes should precisely match the original profiles.



Some windows suffer from loss of painted detail. There is no agreement about whether this can or should be reinstated. However, if such a window is to be re-leaded, extreme care must be taken not to inflict further paint loss. In particular the conservator should avoid any brushing of the surfaces.

Introduction The aim of this section is to set out the principles of good conservation practice. It is hoped that this will be of interest not only to stained glass conservators but also to owners and church officers whose job it is to commission repairs. It goes without saying that the word “he” is only used for simplicity of syntax and must be taken to mean “he or she”.

Definition of terms In formulating principles, it is essential to start with definitions of terms. In 1979 the International Council of Monuments and Sites (ICOMOS) adopted a charter, known as the Burra Charter. The Burra Charter has been revised and updated several times, and it is the current revision which dates from 1999 which should be followed. The Charter provides a virtually ready-made set of definitions, formulated by a distinguished international council, of words taken from the broader world of conservation. These have been slightly adapted for the present booklet so that they apply specifically to stained glass, as follows:

Preservation means maintaining a stained-glass window in its existing state, monitoring and, where possible, retarding deterioration.

Restoration means returning the existing fabric of a stained-glass window to a known earlier state by repairing existing damaged pieces of glass, but without the introduction of new pieces of painted glass. However, in the context of a stained-glass window, the term may encompass the replacement of lead-work, as this is a subservient component.

Reconstruction means returning a stained-glass window as nearly as possible to a known earlier state by processes including the introduction of replicas of pieces of painted glass too badly damaged to repair and/or the reinstatement of glass-paint.

Re-creation means *conjectural reconstruction*. It includes the informed introduction of new pieces of glass to replace lost pieces of original glass.

Conservation means all the processes of looking after a stained-glass window. It may, according to circumstances, include *Preservation, Restoration, Reconstruction* and *Re-creation*, and will commonly be a combination of more than one of these.

Minimal intervention - General statement

This statement is taken from the Burra Charter:

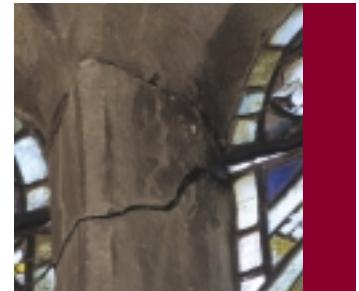
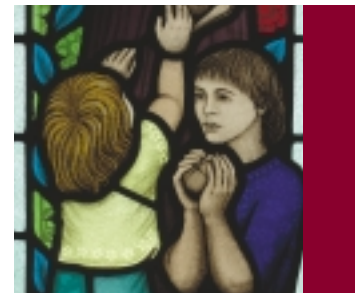
“Conservation is based on a respect for the existing fabric and should involve the least possible physical intervention.”

Minimal intervention applied to re-leading Re-leading the whole of, or parts of, a stained-glass window is not to be seen as a routine or trivial step. The conservator should not propose or accept a contract for the re-leading of a window unless he genuinely believes there is no alternative. He should not point to buckling of the stained glass as a conclusive indication for re-leading. In many circumstances, he should propose preservation in the form of a carefully-planned programme of the extent of buckling and of any cracking of glass.

If lead comes are to be replaced, the conservator should use new comes of the same profile as those being replaced. The exception to this is where original leads have been “stretched” to accommodate thick glass and these should be replaced by new leads with very wide hearts, which are available by special order. The re-glazing should be done to the highest standard of craftsmanship using best quality materials. Sound waterproofing should be seen as an essential element in the structure of a window.

Minimal intervention applied to removal and re-fixing The principle of minimal intervention to the architectural heritage is paramount. Except in the most straightforward cases, the process of removing and re-fixing a stained glass window should be overseen by the architect, who may or may not wish to bring in stonemasons. The conservator should consult the architect

Vital parts of the picture sometimes extend into the perimeter borders. The border glass may seem to be plain but it is often tinted or has painted textures. So borders must never be deliberately broken as a means of removing the window from the opening.



During the restoration of a window, the architect may have to call in stonemasons to deal with damaged or decayed window-openings or other structural problems.



Restoration of pieces of glass in this damaged window was done using narrow strips of copper-foil. In some cases, the use of resins is appropriate. Some new glass-painting was required, but the priest had carefully saved all the damaged fragments and these provided the evidence to enable the studio to paint accurate reconstructions, rather than conjectural re-creations.

and keep up-to-date on current thinking on stonework repairs, lime mortars, ferramenta and condensation-outlet systems. If correct stone-working tools and techniques are used, no glass need be damaged during the process of removing the stained glass from the window-openings and there should be little or no damage to the stonework. **Note: The practice of deliberately breaking the outer glass borders as a method of removal must never be done in any circumstances.**

Unusual ironwork, such as pegged T-bars, should be renovated and retained, but the principle of minimal intervention can be relaxed in the case of simple, straight, ferrous saddle-bars which should be replaced with non-ferrous bars of adequate profile. The use of putty to point around the perimeter of a stained glass window is to be discouraged in all cases, except where there is a timber frame. Modern synthetic mastics should not be used as, when they fail the seal is broken and there can be ingress of water. It may be the case that deterioration to the stained glass window has been caused or exacerbated by poor condition of stonework or rainwater goods if so, remedial steps should be taken to correct these prior to refitting the glazing.

The techniques of preservation, restoration, reconstruction and re-creation Where a window has been accidentally or criminally damaged, and the damaged fragments of glass survive, the options open to the conservator for each piece of damaged glass are:

- (a) *Preservation* leave in damaged state
- (b) *Restoration* repair with an appropriate technique
- (c) *Reconstruction* replace part or whole with a replica

Where a window is to remain *in situ*, the conservator should, in very many cases, opt for preservation. The introduction of new pieces of glass-painting into an existing window is seldom successful.

If a window has been removed to the workshop then, wherever possible, the conservator should employ one of the techniques of restoration, such as copper

foil, string-lead or resin-bonding. The introduction of new lead comes is not a suitable means of repairs, especially where this involves the re-shaping of original pieces of glass. The conservator should resort to reconstruction only where there is no alternative.

There are cases where re-creation, i.e., informed conjectural restoration, may be called for (e.g. where the damaged fragments have not been saved), but it is important for a conservator to be open about his abilities in this area. However excellent his craftsmanship, no craftsman can have every skill and there is no loss of face and no criticism implied in accepting that the ability to re-create glass-painting in an historically-accurate style is a highly specialised skill which he may not possess.

It must be emphasised that, in every sense, reconstruction is preferable to re-creation, which must be undertaken only where there is no alternative. To this end, the conservator should make every effort to track down lost fragments of glass and existing photographs of the window prior to damage.

In preparing the cartoon for the proposed re-creation, the conservator should seek the advice of a stained glass historian. In addition, he would do well to make use of photography of related windows, or undamaged parts of the window, to assist with preparing the cartoon.

A replica, whether a reconstruction or re-creation should be openly declared by discreetly signing and dating within the fired-glass paint. Any significant original pieces of damaged glass, which are not reused in the conservation, should be labelled and stored either at the studio or at the church.

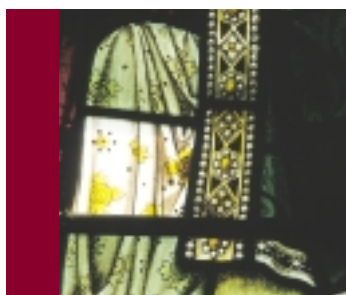
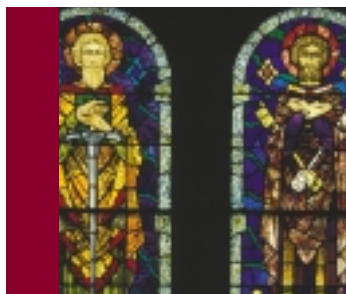
The studio's responsibility where glass-painting is involved Reconstruction, in the form of painting replicas and re-creation, in the form of designing and painting informed conjectural replacements, are jobs to be undertaken only by a highly-skilled and experienced glass-painter. In addition, re-creation is essentially a problem of drawing and cartooning, backed up by

Several pieces of glass here are reconstructions, including the upper hand and two of the decorated diamond quarries. The new work has been initialled and dated within the fired glass-paint. Faking has no place in conservation.



The figures in this window by James Powell & Sons are of exceptional beauty, but the head of one of the angels has been replaced with a new head in a different style. The character of the window has thereby been altered.

In this Harry Clarke window, the head of St. Peter has been replaced and the new head does not match in style to that of St. Paul. The window is fitted with secondary glazing in polycarbonate sheet, which is now discoloured. In the extreme conditions of heat behind the secondary glazing, the stained glass has buckled.



The new piece of drapery inserted here is quite well painted, but the colour of the glass is entirely wrong. To obtain the exact colour from the glass-blowers takes time and may be costly, but unless this is done, the appearance of the window will be spoiled.

an extensive knowledge of the styles and techniques of the cartoonists and studios of the nineteenth and twentieth century.

It is the responsibility of a studio, entrusted with the contract, to ensure that this part of the work is undertaken only by a cartoonist and glass-painter with the appropriate ability. This may involve using the services of a cartoonist or painter outside of the studio.

When painting replicas or re-creations, the studio should make every effort to obtain glass of the correct colour - this will often involve research in tracking down and matching samples from the huge range offered by the two European firms of glass-blowers. Poorly matched glass should not be used merely because it is the only alternative from stock, even though to do otherwise would involve extra effort and expense.

Documentation The whole conservation process should be fully documented, including the making of a photographic record of the work before commencement, during and after completion, the making of annotated drawings and the preparation of a full written description of the work undertaken. This documentation should be available for consultation by the church, the architect or the Heritage Council.

Acquiring a working knowledge of the nineteenth and twentieth century studios A conservator working on the stained glass of the nineteenth and twentieth centuries should aim to study in order to improve his knowledge of the history and work of the stained-glass studios of the period. He should make every effort to ascertain as much art-historical and technical information he can about any window on which he works. This could include the studio, the designer, the cartoonist, the date (or at least the decade) of manufacture. In this way, he can build up a repertoire of knowledge and understanding of the styles, techniques, materials and historical context of the work of some of the artists and studios of the nineteenth and twentieth centuries.

On-going practice A conservator should study, research and aim to improve his practical skills, as would practitioners in other activities, for example music, sport or teaching.

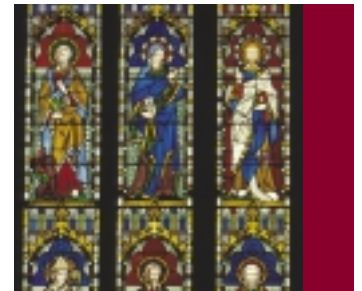
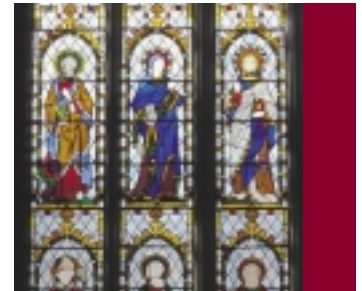
Minimal intervention - applied to destructive practice The conservator should not undertake the discredited practice known as 'pickling', whereby the backgrounds to figurative windows are removed and replaced by plain glass quarries.

Minimal intervention-applied to the disposal of a stained-glass window The permanent removal from a building of an existing stained glass window can very seldom be justified and is unlikely to receive planning permission save in exceptional circumstances.

Window protection The installation of exterior secondary glazing, sometimes known as 'storm-glazing' is a discredited practice which the conservator should avoid. Section Three of this booklet is devoted to the subject of protecting stained glass windows.

Complying with the law It is the duty of the conservator to comply with the law so far as work to stained glass windows is concerned. Advice on this is given in Section One of this booklet.

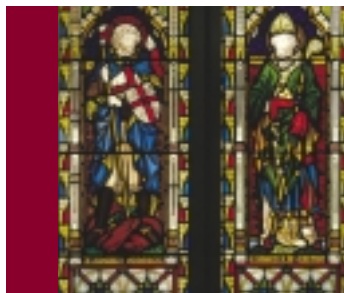
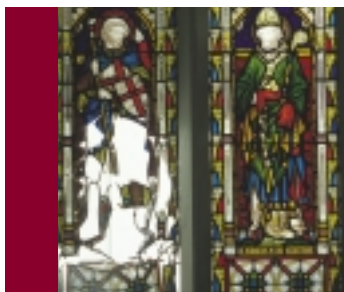
In a misguided attempt to "modernise" this important Pugin window, the patterned backgrounds were removed and replaced with plain glass. This destructive practice is an extreme example of flouting the fundamental principle of conservation.



Subsequently the backgrounds were reinstated. The designs for the new pieces of glass are conjectural, based on other windows by Pugin of this period. In conservation terms, these additions are known as re-creations. By getting to know the dates and the names of the artists of the windows on which he is working, the conservator can build up a repertoire of styles of painting and drawing.

Section Three The protection of stained glass against damage

The lower panels of windows are a favourite route of entry for burglars. Motiveless vandalism and determined burglary are different problems. It has to be accepted that this kind of damage can only be deterred, not prevented, by any of the standard types of window guards.



The damaged window was re-made using a combination of restoration and reconstruction. All windows in this church had previously been photographed.

Any protection of stained-glass windows is subject to planning permission, and the local authority should always be consulted prior to any decision being taken.

The function of guards It is important to distinguish between the wish to protect windows against casual vandalism, with which this section deals, and the wish to prevent deliberate criminal entry. This latter topic is not covered by the present booklet. It is a mistake to assume that window-guards will prevent burglary although they may have some deterrent effect.

The advice given here is based on practical experience over twenty-five years and on discussions with architects, stonemasons, stained-glass studios, insurance companies, conservation bodies and Diocesan Advisory Committees in England.

A balance has to be struck between (a) the desire to protect windows in the best available way, (b) regard for the architectural aesthetics and (c) respect for the fabric of the building.

Before investing in guards, it should be established whether it would be feasible not to have any guards at all. The only real solution to the problem of vandalism is to attempt to re-educate those responsible. There are certainly rewarding cases where vandalism has been successfully eliminated by the quality of usage of the church building throughout the week and by creating a well-established role for the building within the community. There is some evidence to support the theory that attempts at providing security can actually be counter-productive.

Galvanized ferrous metal wire guards Wire-guards provide a good method of protecting windows, without compromising the architecture. Two rules apply if the guards are to be visually acceptable. (a) They must be shaped to fit to each lancet and tracery-light. (b) The silver/grey colour of the galvanizing process is inappropriate for a church and they should be given a black finish. The principal drawback of galvanized wire-guards is that, unless they are

regularly maintained, they will eventually rust and this can cause serious, possibly irreversible staining to or spalling of stonework. Cases are known where rust has penetrated up to 30mm into the stone.

Those opposed to wire-guards will argue that they do not give protection against someone armed either with an air-gun or with a hammer in one hand and a spike in the other. But, statistically these kinds of incidents are rare, most damage being caused by stone-throwing or by deliberate attempts to break in. The other objection often cited is that the guards can be visible from the inside, looking out and it has to be said that they can be seen through leaded-lights and lightly-painted stained-glass windows.

We often feel that the problems we face in society today are new and we imagine a golden era when these problems did not exist. This certainly is not true in the case of crime in general and vandalism in particular. The large stained glass studios routinely fitted wire-guards when they installed new windows in their thousands in the second half of the nineteenth century. So this simple, obvious approach to protecting stained-glass windows is very well established and in most cases, is remarkably effective. In a sense then, if the problem of rust-staining can be overcome, there is no need to look further for solutions.

Copper wire-guards The points made above apply equally to copper guards. The only difference is that the staining will be green rather than red.

Stainless steel wire-guards A completely effective answer to the problem of rusting and staining is to be found in the use of stainless-steel, rather than ferrous, wire-mesh. Two grades of metal are commonly in use. Grade AISI 304 is adequate for most applications but the more expensive grade AISI 316 is to be recommended for buildings in coastal locations or in heavily-polluted industrial areas.

If the risk of rust staining is to be eliminated, it is essential that not only the wire-mesh, but also the clips and the screws are of stainless steel.

These massive, industrial guards are doubtless effective, but they are quite unsuitable for this historic cathedral. The materials are too heavy and, by fitting mesh across the whole of the lancets and tracery, the appearance of this elegant Decorated Gothic window has been ruined. A balance has to be struck between protecting the glass and respecting the architecture.



Vandalism is not a new problem. Nineteenth-century windows were routinely fitted with wire guards and they did an excellent job of protecting the stained glass for several decades. However, the guards here were fitted in the 1860s and should have been renewed long ago. They have now caused unsightly, and probably irreversible, rust damage to the stonework.

The most suitable type of window guard is that made of welded stainless-steel wire-mesh, secured with stainless-steel clips and screws and grey nylon wall-plugs. The black finish here is a polyester powder-coating.



The windows at this church are fitted with stainless-steel wire-guards, but they are scarcely discernible and the visual integrity of the building has been preserved. Secondary glazing was removed prior to the fixing of the guards.

Apart from eliminating rusting, a second clear advantage over galvanized wire is provided by the fact that stainless-steel wire has a greater integral strength. Moreover the welded mesh, characteristic of stainless-steel guards, is more rigid than the woven mesh, characteristic of galvanized guards. It has been found that welded wire-mesh made of wire of diameter only 2.5mm (12-gauge) has the required strength and this makes for relatively fine guards causing minimal visual obstruction. A typical specification is for a welded 12-gauge wire mesh of 75mm x 12mm spacing and with 6mm diameter rods for the perimeter.

The technique known as powder-coating gives a pleasing matt black finish which has a real visual advantage. As elements in an architectural whole, stained glass windows externally have an overall dark and non-reflective character. Experience has shown that, when fitted with black-finished guards this appearance remains remarkably unaltered. The guards virtually 'disappear' and the character of the building is scarcely affected. This is in marked contrast to the use of plain sheets of glass or plastics as will be discussed below. For unpainted guards, the natural finish of stainless steel will in time, lose its shine, acquire patination and a similar result will be achieved.

Examples of black-finished stainless-steel wire-guards can be seen at the Church of Ireland churches at Abbeyleix, Co. Laois and Myshall, Co. Carlow.

Secondary glazing with polycarbonate, perspex or glass The protection of stained glass with sheets of polycarbonate, perspex or glass is to be discouraged. Indeed, in most cases it is completely unacceptable.

Both perspex and glass can be dismissed immediately since they are themselves breakable; so do not satisfy the prime requirement of protecting the stained glass against damage. Their use should always be avoided. There may be a few exceptional cases where the use of polycarbonate can be considered, provided that the design conforms to certain strict requirements. One such case is where an engraved window is to be protected, since the essential character of such a

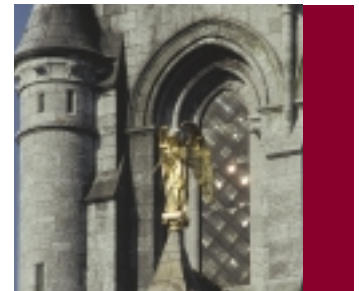
window would be destroyed by the use of wire- mesh. However the first principle applies here as with all guards and this is to establish whether a guard is really needed at all: is there a high risk of vandalism?

If polycarbonate is used, its function as a shield against damage must not be confused with that of trying to provide double-glazing for thermal reasons. Frames should not be used and the sheets should not be sealed into the wall, as this produces harmful, unventilated cavities. Such cavities are damaging both to the stained glass and to the stone and they encourage organic growth. Polycarbonate must never be fitted in large sheets, covering stonework as well as stained glass but must be cut to the shape of the glazing, with all stonework exposed. There should be gaps between plastic and stone to allow for a free flow of air and to accommodate expansion and contraction. The fixings, which should be of stainless steel (not aluminium), should also be designed to allow for movement. To avoid distortion, sheets should be of 6mm thickness.

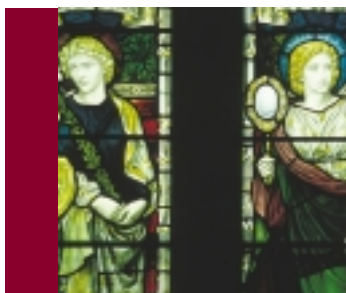
There remain serious drawbacks to the use of polycarbonate shields even if correctly designed and fitted:

- (a) The reflections give the building an unpleasant 'blind' look and any distortion in the sheet leads to an ugly 'hall-of-mirrors' effect.
- (b) The polycarbonate sheet can be deliberately scratched, disfigured with graffiti or destroyed with petrol.
- (c) The outer surface of the stained glass (and the inner surface of the polycarbonate) cannot be easily cleaned.
- (d) Unlike wire guards, the long-term properties of polycarbonate shields are not known. They may possibly last for twenty years. Discolouration is very likely. To spend money on polycarbonate will not be as sound an investment as spending a similar sum on stainless-steel wire guards, which are likely to put in a century of service.

The outer appearance of leaded-light windows and stained-glass windows is an important element in the architectural whole, providing texture and balance. These tower windows have never been guarded and have remained undamaged since 1880.



When windows are covered in plain sheets of glass or plastic, there are large plain reflective areas and the integrity of the building is seriously degraded.



Some of the drawbacks of secondary glazing are graphically illustrated in this pair of pictures which show the inside and outside of the same window. The broken glazing can be seen on the outside but is also clearly visible from the inside, appearing as cracks across the heads of the figures. Similarly the unpleasant piles of insect eggs can be seen not only outside but also inside, as shadows. There is fungal growth in the cavity between the two layers of glazing and the secondary glass is stained with rust.

The removal of secondary glazing Whilst secondary glazing should ideally be removed there is a classic circular dilemma here. The presence of the secondary glazing could well have contributed to the deterioration of the leaded glazing which may no longer be weatherproof. So, without the secondary glazing the window might leak. In that sense, the leaded glazing has become dependent on the very thing which is harming it! The only way to establish this will be to take a cautious approach. First, a small test area of the exterior secondary glazing should be removed and a water test carried out. If there is no leakage then the secondary glazing can come off. If there is leakage then it has to be reluctantly accepted that the exterior secondary glazing will have to be retained until such time as the secondary re-leading can be done.

In order to avoid damage to the stained glass, the process of removal of the secondary glazing must be carried out with extreme care, using small tools. The technique employed must involve only forces applied parallel to the glass and must never be directed inwards towards the stained glass.

Isothermal glazing The system known as isothermal glazing, which is designed to protect historic glass against environmental damage - rather than vandalism - is complex, and not discussed in this booklet. In certain exceptional circumstances, isothermal glazing may be considered. Advice should be obtained from studios which have specialised in this technique.

The option of not guarding The policy of deliberately leaving windows unguarded is a sensitive issue, and each case must be taken on its merits. It may be more appropriate in some localities than others. For this approach to be effective, it must be accompanied by an untiring but rewarding campaign aimed at involving the community and the potential offenders. In our experience, most damage is caused by a very young age group. This area of activity, touching as it does on pastoral matters, is beyond the scope of the present paper. A church in good order, with a well cared-for exterior and surroundings is less likely to attract damage than one which looks run-down and neglected.

Conclusions Window guards can be effective against vandalism but will not in general prevent a determined burglar. Isothermal glazing, which can be considered in rare circumstances, is not designed as a protection against vandalism.

No design of guard is perfect

Our order of preference is:

- 1) No guards at all
- 2) Powder-coated stainless-steel wire guards
- 3) Natural-finished stainless-steel wire-guards
- 4) In exceptional cases only, correctly-designed polycarbonate guards

The Architectural Heritage Protection Guidelines state that:

“New external protection may be required to protect historic or interesting glass from breakage or from damage by the elements. Where this is the case, this protection should be provided in a way which is reversible and as unobtrusive as possible. The protection should not be made or fixed in a way that will damage the fabric or appearance of the structure or window. For example, the rusting of metal grilles or run-off from copper or iron fixings could cause damage to the fabric. Another example of bad practice is the creation of unventilated cavities behind external secondary glazing panels that encourage excessive and damaging heat build-up or allow condensation to occur on the face of the historic glass. In this case, the applicant should indicate how the historic glass is to be ventilated.”

The appearance and character of the building will be harmed by the use of plastic sheeting that can surface-craze or become opaque through exposure to the elements. This sheeting is also highly flammable and its use should not be permitted near valuable glass where the exterior is accessible to vandals. The appearance of the external protection will be enhanced by requiring it to be formed to fit the shape of the opening and any tracery while allowing for sufficient ventilation.”

Amongst the many disadvantages of secondary glazing is the simple fact that it is breakable. Here a stone has broken both the secondary glazing and the stained glass.



Thin polycarbonate sheeting has been used here, giving hideous “hall-of-mirrors” distortions. This can be overcome by using 6mm thick sheet, but the reflections, whilst not being distorted, will still give the building a “blind” appearance.

Section Four Making a photographic record

Stained glass of 1920 by Michael Healy of Dublin at St. Mary's Church, Castlecomer, Co. Kilkenny.



The need for stained glass to be recorded The Heritage Council strongly recommends that it is in the interest of all concerned for a photographic record to be made of the unique stock of stained-glass windows in Ireland.

This can greatly assist in the study and appreciation of these important works of art, especially if coupled with a list of the artists, studios and dates and some background information.

Another important use to which a photographic record can be put is to assist with the repair of damaged windows. By the very nature of the material of which it is made, a stained-glass window is particularly vulnerable. Whilst having a vital architectural function, it is also a valuable and unique work of art. Experience has shown that faithful repairs to windows following damage can be carried out more effectively if photographs of the windows exist. In the case of churches, a photographic and historic record is of interest, not only to the members of the church, but also to visitors, possibly through the production of an illustrated guidebook. Good quality images can also be used for educational purposes and to form the basis of postcards or greetings cards.

The Church of Ireland is making a comprehensive photographic and historic record of all the stained glass in its churches in the Republic. Ideally, for churches of other denominations and for other buildings, a photographer experienced in recording stained glass should carry out this work, but the following paragraphs contain advice for those wishing to take the photographs themselves.

Floor-plan of building Before taking the photographs, a simple floor-plan of the building should be drawn, indicating the position of each window. For a church, the sanctuary east window is numbered as W1. Then W2, W3, etc. are those proceeding in a clockwise direction through south, west and north windows.

Right: Stained glass of 1938 by Edward Burne-Jones, made by Morris & Co. of London at Mulrankin Church, Bridgetown, Co. Wexford



Stained glass of 1901 by John Bishop Earley of Dublin at Drumcondra Church, Dublin.



Film Transparency (slide) film makes for the best record and is preferable to negative (print) film. The colour and detail are superior and, if a print is needed for a particular purpose, this can now be made very effectively direct from the transparency. The best definition is obtained by using a slow film, preferably ISO 25 or 50 and no higher than ISO 100.

Lens A long focal length lens, rather than a wide-angle lens reduces perspective distortion. A good quality 100-300 zoom is ideal for most purposes. The camera is best set up at a good distance from the window.

Tripod The camera should be set on a tripod, the taller the better, and a cable release or delayed-action function used.

Digital photography Digital cameras can be useful but the cheaper models have limited definition. Even the best models available do not have the definition equivalent to an ISO 50 slide film. The digital camera should be set to record the maximum file-size, even at the expense of storing fewer pictures. A spare memory card expands the capacity. The digital camera needs a lens with a good range of focal lengths to match the performance of a conventional camera with a 100-300mm lens. Digital images of sufficiently high resolution can be used to produce good-quality prints and slides.

Weather and lighting The ideal weather conditions are bright but overcast. In any case, the day or time of day should be chosen so that there is not direct sunlight. The lights must be turned off and no flash or photographic lighting used.

Framing Both overall shots and close-up details are useful. For large windows, it is not wise to record the whole window in one frame.

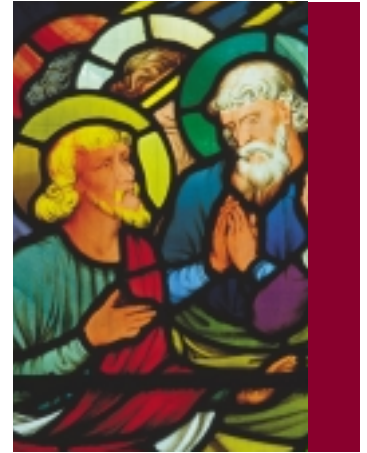
Focus The most common problem seen in photographs of stained glass is poor focus, possibly due to having to deal with transmitted light in a relatively dark environment. Careful use of automatic focus is of great help here.

Assessing the correct exposure The brightness range of many stained-glass windows is greater than the range recordable on colour film, although slide films (particularly from certain manufacturers) have a greater range than print films. If first-rate results are wanted, the choice of exposure is critical. This is a complex matter and cannot be dealt with in any detail here. The best results are obtained by using a specially-calibrated hand-held spotmeter in conjunction with the Ansel Adams Zone System. If the meter within the camera is to be used, the exposure which it proposes is seldom the one to use, although it does provide some guidance. As a broad principle, darker windows should have a shorter exposure, brighter windows should longer exposure, than the camera meter suggests. Where there is doubt, several alternative exposures can be used: this is known as bracketing.

Processing of films Having carried out the photography, the film should be sent promptly, by Registered Post or courier, to the film-manufacturer's processing laboratory or to a professional colour laboratory. Details of these can be found in the classified section of the telephone directory. For prints, if the laboratory is told that the subject-matter is stained glass, they can adjust the exposure so that the highlights (e.g. the faces) do not burn out.

Labelling Each slide, or each print must be labelled with the name of the building and the window number and possibly the date.

Number of copies - and storage It is sensible to make at least two complete sets and to store them at different locations. The best and cheapest way to obtain two copies of a colour slide is to press the shutter twice, rather than to have duplicates made. For longest life, prints and slides should be kept in a dry, cool, dark place. Digital images should be 'backed-up' on CD, but will require regular upgrading, as there is not yet a reliable long-term digital storage method.



Stained glass of 1876 by William Burges, made by Saunders & Co. of London at St. Fin Barre's Cathedral, Cork.

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Department of Arts, Heritage, Gaeltacht and the Islands, Department of the Environment and Local Government; 2001

THE AUSTRALIA ICOMOS CHARTER FOR THE CONSERVATION OF PLACES OF CULTURAL SIGNIFICANCE (THE BURRA CHARTER);

International Council of Monuments and Sites (ICOMOS), 1999 (first published 1979 and revised 1981, 1988 and 1999)

LIST OF STAINED GLASS WINDOWS GRANT-AIDED BY THE HERITAGE COUNCIL:

St. Peter's College, *Wexford - Rose Window*
St. Michael's Church, *Abbeyleix, Co. Laois*
Mariners Church, *Dun Laoghaire, Co. Dublin*
St. Lachtain's Church, *Freshford, Co. Kilkenny*
Sligo Cathedral, *Co. Sligo*
Lissadell Church, *Co. Sligo*
Adelaide Memorial Church, *Myshall, Co. Carlow*

Back Cover: Stained glass of 1907 by Beatrice Elvery of Dublin at St. Ann's Church, Dublin



*Stained glass of 1914 by various
An Tur Gloine artists at All Saints'
Church, Grangegorman, Dublin*



*Stained glass of 1909 by
Cox & Buckley of Youghal at
a parish church, in Co. Laois*



*Stained glass of 1860 by Clayton
& Bell of London at St. John the
Evangelist's Church, Ardamine,
Co. Wexford.*



the care of STAINED GLASS

Ireland has a rich legacy of stained glass. Fine examples of the art can be found in public and private buildings across the country, but mainly in our churches. The work of some of the finest European, English and Irish artists graces great cathedrals, historic buildings and humble churches.

This booklet is intended as a guide for the custodians of these treasures, to assist them in their care and conservation.

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