THE YORK GLAZIERS TRUST

Over 50 Years of Excellence in Stained Glass Craft and Conservation

Proposals for the Conservation and Environmental Protection of Window nIII (The Butler Window), Lincoln's Inn Chapel, London

August 2020

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Executive Summary

- The windows of the chapel if Lincoln's Inn are one of the most important and well-preserved schemes of early seventeenth-century stained glass in the UK, and precious survivors of the Civil War, Great Fire of London and two World Wars.
- There is widespread evidence that window nIII has suffered from significant environmental damage in the form of pigment and enamel losses. Exposure to environmental forces such as cycles of heating and cooling, moisture, and in particular condensation on the inner surfaces of the glass, is the underlying cause of these losses. The window will continue to deteriorate unless it is protected from environmental damage.
- The principal recommendation is therefore to install an internally ventilated protective glazing system, to safeguard against future deterioration and prolong the life of the stained glass.
- As the window will need to be removed to facilitate this essential work the opportunity should be taken to address a number of other conservation issues, many of which cannot be addressed in situ. These include the cleaning of the heavily soiled surfaces of the glass, thereby removing damaging hygroscopic materials, the repair of fractured glass using conservation grade adhesives and the strengthening and consolidation of the existing lead framework (N.B. re-leading the window is not necessary or advocated at this time).
- The studio-based conservation will also allow for the selective removal or thinning of disfiguring strap or repair leads, albeit only where legibility is truly compromised and adhesive bonds can safely be used as an alternative treatment.
- Work will be accompanied by full high-resolution photographic and diagrammatic documentation of the glass.
- The stained glass will be installed in a slim-line bronze framing system to allow mounting to the inner stone mullion profile with discreet fixings, allowing for internal ventilation.
- The existing glazing groove will be occupied with the protective glass, made weather-proof by means of traditional lime mortar at the perimeter edges. Our proposal allows for clear sheets of laminate glass, with leaded perimeters. Lead divisions of the clear panels will align with the horizontals of the externally mounted ferramenta bars and will minimize any risk of shadowing on the historic stained glass.
- The existing external polycarbonate protection is ugly and offers little or no environmental protection to the stained glass and should be removed, enabling the external ferramenta and the intended character of the window to be revealed.

The Brief

In December 2019 in response to an invitation to inspect the stained glass windows of Lincoln's Inn Chapel, London, by Marcus Chantrey, RIBA AABC, Architect of Benjamin and Beauchamp, the York Glaziers Trust submitted an outline report with recommendations for conservation and protection of the windows. In January 2020 Sarah Brown, Director, and Nick Teed, ACR, Conservation Manager of the YGT were invited to discuss the proposed recommendations at Lincoln's Inn and were subsequently invited to work with the Inn to further these proposals.

Nick Teed undertook a second inspection of window nIII (the Butler window) 3 August 2020, at the request of Marcus Chantrey, using high level mobile access equipment externally and a fixed scaffold internally. This report will focus on recommendations for the conservation and protection of window nIII, which has been identified as being of the highest priority for treatment in the Chapel.

Significance of the Window

Between 1623 and 1626 six of the south and north aisle bays were glazed, with depictions of the twelve apostles on the south side and patriarchs, prophets and saints on the north. Three of the windows were executed by Abraham van Linge, one by his brother Bernard van Linge and two by Richard Butler, all leading exponents of painted and enameled stained glass during this period, and who are likely to have collaborated on this project together[1]. In the early seventeenth century the Holborn area had become a centre for stained glass artists, who were conveniently located in the vicinity of the Inns of Court and Chancery, and of numerous potential clients[2]. Much of the stained glass in the Chapel today has been restored and re-located (principally by C.E Kempe & Co. during the 1920's), following a blast from a Zeppelin raid in 1915. Two of the windows by Abraham van Linge were lost as a result of this damage, however the scheme remains a fine and rare example of the work of these important artists in London.

[1] Lane, 2005

[2] Lane, 2005

Figure 1. Window nIII

Lincoln's Inn Chapel, London

Ground plan indicating window numbers
(numbered according to CVMA convention)

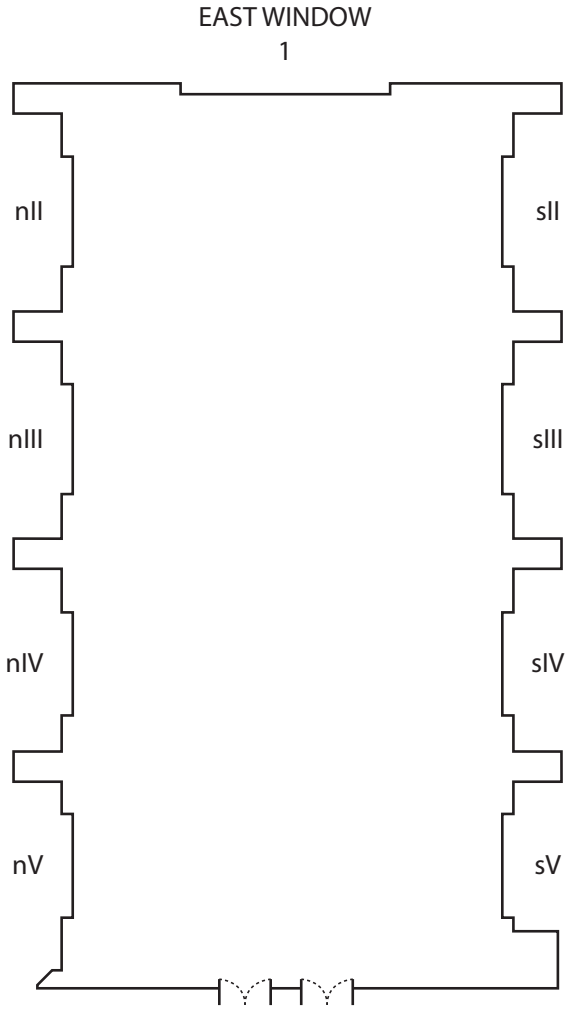

Figure 2. Window number plan of the Chapel

Statement of Need

The repertoire of techniques and materials available to the glass painters of the seventeenth century expanded upon those of the medieval period by the inclusion of a new array of glass paints and pigments, and as glass making technology advanced, the ability to make and use thinner glasses. Richard Butler used a wide range of enamel pigments in the production of window nIII for Lincoln's Inn. Panel 1a (Figure 3.) is a prime example of the flamboyant style, which uses and almost rainbow like combination of enamel colours to add vibrancy to the wings of the angel holding the armorial shield. Enamel pigments contain a high proportion of ground glass, which melts at a lower temperature than the base glass to which it is applied and allows the paint to fuse to the surface of the window glass during the firing process. This layer of pigment can be extremely thin and fragile. Whilst the firing process was intended to bring permanency to the painting, in nearly all cases the glass used to make the pigment was different to that used to make the window. The enamel pigments and the base glasses to which they are fused during the firing process have differing coefficients of expansion, meaning that over time, as the glasses heat up and cool down, the very thin enamel layer is prone to dislocate from the base glass. This is exacerbated by the presence of moisture.[3]

We can see in window nIII many examples where enamel pigments have been lost completely, leaving a bright patch of clear base glass (see Figure 4.). Cycles of condensation have also over time triggered chemical reactions at the glass surface which have led to corrosion of the pigment layers, as can be seen in the illustration in Figure 5. The numerous fractures in the window have in places revealed the glass edges showing the glass thickness to be generally less than 2mm (see Figure 6). The wider array of tones of pigment being used by stained glass artists of the period also encouraged the use of larger pieces of glass, as glass artists sought to emulate the effects of their peers working on canvasses, exacerbating the problem of structural security from wind pressures or impact damage. The ongoing nature of the environmental deterioration of the decorated surfaces of the window and the fragile nature of the medium mean that protection of the window is of paramount importance for it's long term survival.

[3] Becherini et al, 2008

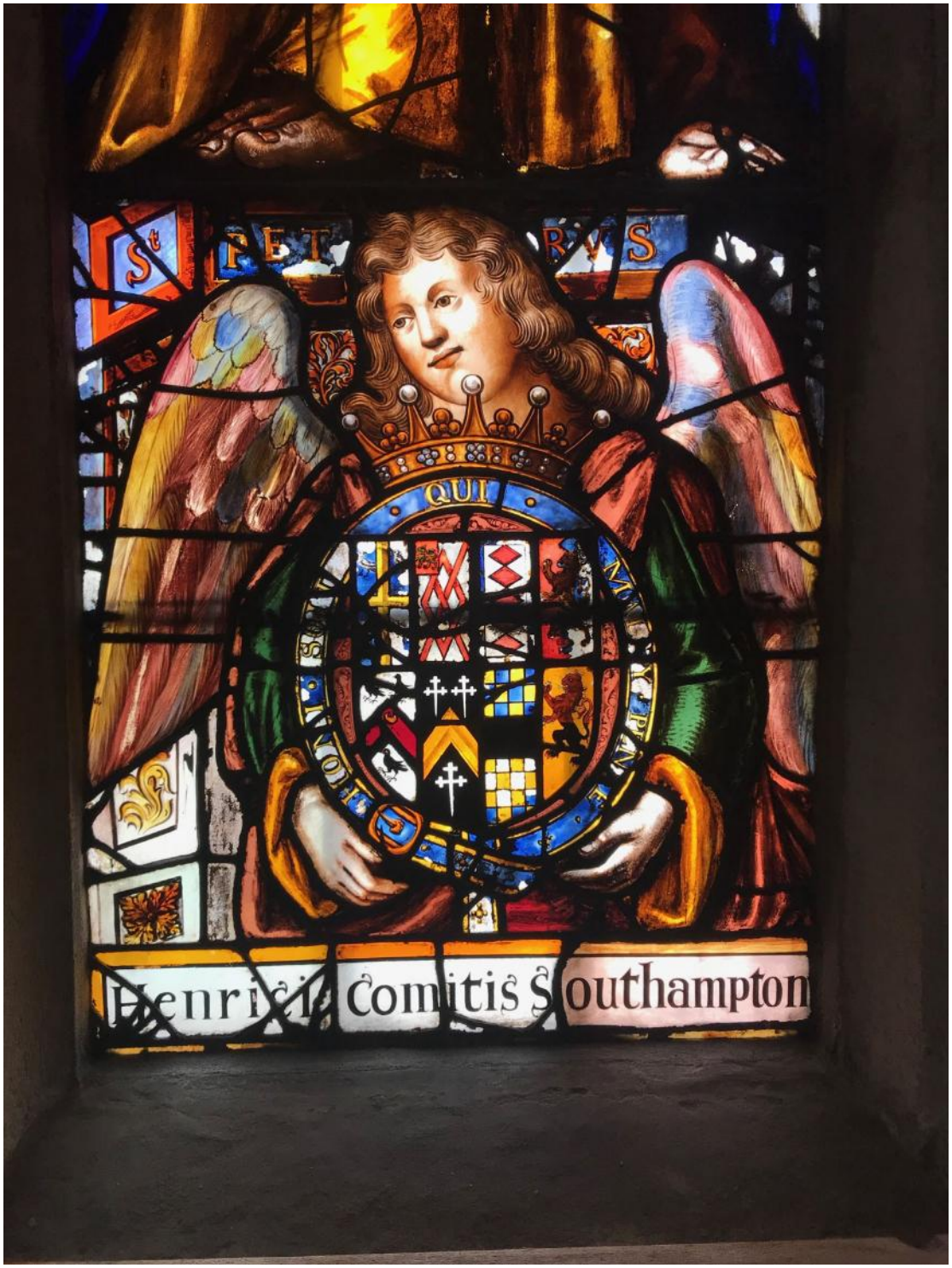

Figure 3. Elaborate use of enamel pigment colours, panel 1a.

Figure 4. Enamel losses to the serpent of St John's chalice, panel 3d.

Figure 5. On-going loss and fading of fired oxide pigment, particularly noticeable around the eyes of the angel in panel B2.

Figure 6. Fractures in the face of the figure of St Peter in panel 4a (repaired previously with putty), reveal the extremely thin glass used.

Proposals for Protection of the Window

An internally ventilated environmental protective glazing system is widely acknowledged to offer the best long-term solution for the protection of vulnerable stained glass, as demonstrated by the International Vidrio Research Project, 2013 and is widely advocated, most recently in guidance issued by Historic England.[4] In order to achieve this, the panels of stained glass are brought forward by approximately 40mm and framed in a slim 9mm bronze "U" channel, with protective glazing occupying the original glazing groove. This will allow the existing iron ferramenta to be utilized as a support for the protective glazing. Internally ventilated EPG systems have been extensively tested and proved to be the most effective means of inhibiting if not eliminating condensation episodes, while at the same time protecting vulnerable stained glass from violent fluctuations in temperature[5]. The same cannot be said for externally ventilated systems, for which very little research evidence is available. This is a particularly crucial consideration when protecting very vulnerable enamel painted glass.

Currently the stained glass within window nIII is held into the masonry groove with a very firm mortar and the panels are tied to the exterior ferramenta. There are no interior supporting bars to the stained glass. In our EPG design the supporting "saddle bars" will be integral to the bronze framework and will also be situated at the exterior face of the stained glass, with the protective panels tied to the exterior ferramenta. The existing groove for the stained glass is biased to the interior of the Chapel to allow space for the external ferramenta within the central part of the mullion, however an optimal interspace between the stained glass and protective glass can be achieved if the framed stained glass is set just internally from the arris line. Figure 7 illustrates the proposed arrangement of stained glass and protective glass and the method of fixing the interior masonry.

The glass proposed for use in the protective glazing is 6mm laminate glass. This will afford a good level of protection, comparable to that offered with the existing external polycarbonate sheets, whilst permitting the maximum transmission of light through the window. It is proposed that the existing polycarbonate sheets be removed and disposed of enabling, the nature of the window and ferramenta to be revealed. An alternative option for the protective glass would be the use of a 3mm mouth blown clear glass, which could be made as a series of leaded lights in the traditional manner, with lead lines following those of the horizontal and vertical ferramenta bars. This would offer a more traditional aesthetic appearance externally, would still

[4] Bernardi et al, 2012; see also Oidtmann et al. 2000, and Pender et al. 2020.
[5] Georgi, 2020

permit an excellent level of light transmission, but would have a reduced level of security from impact damage, run the risk of some shadowing on the historic glass and also carry an increased cost.

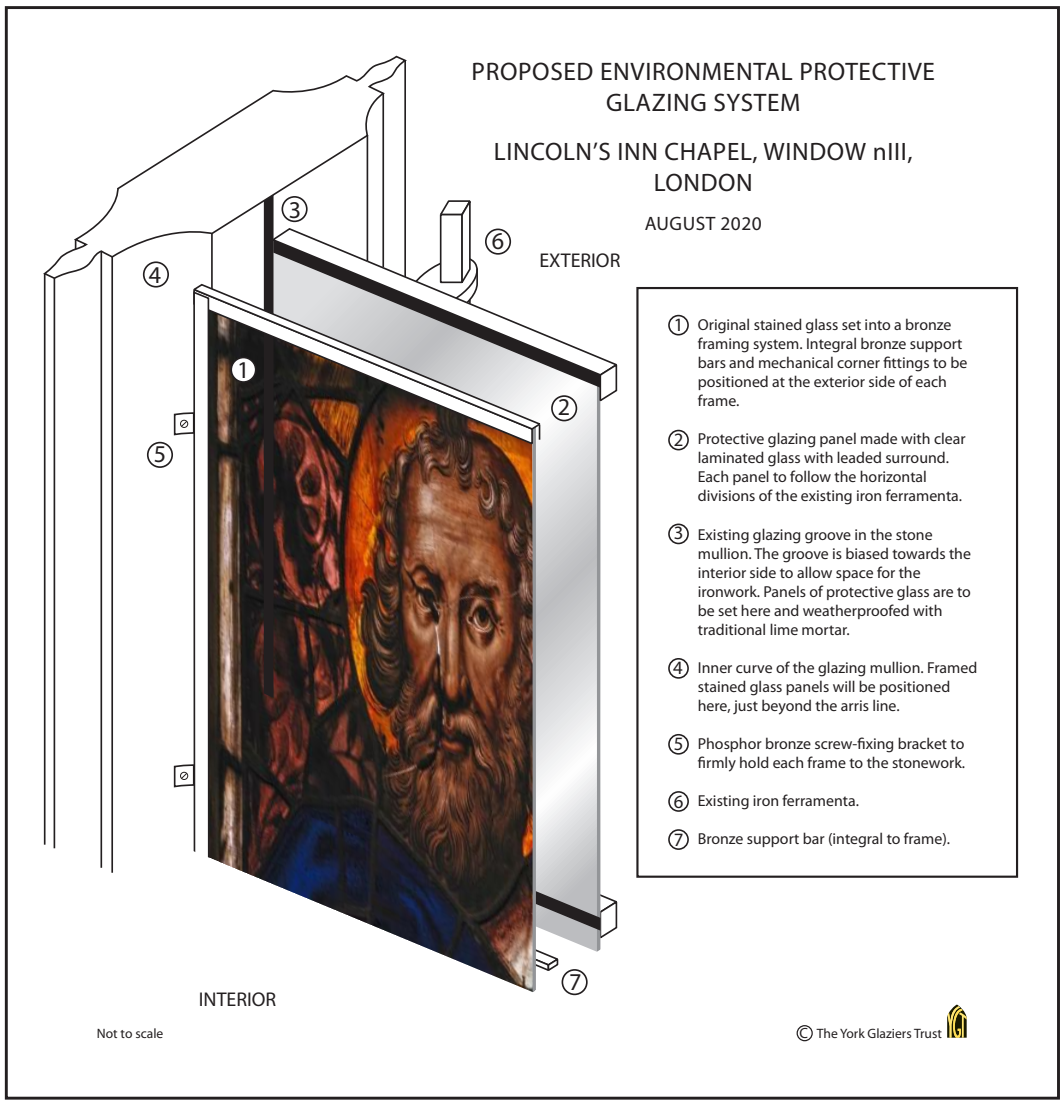

Figure 7.

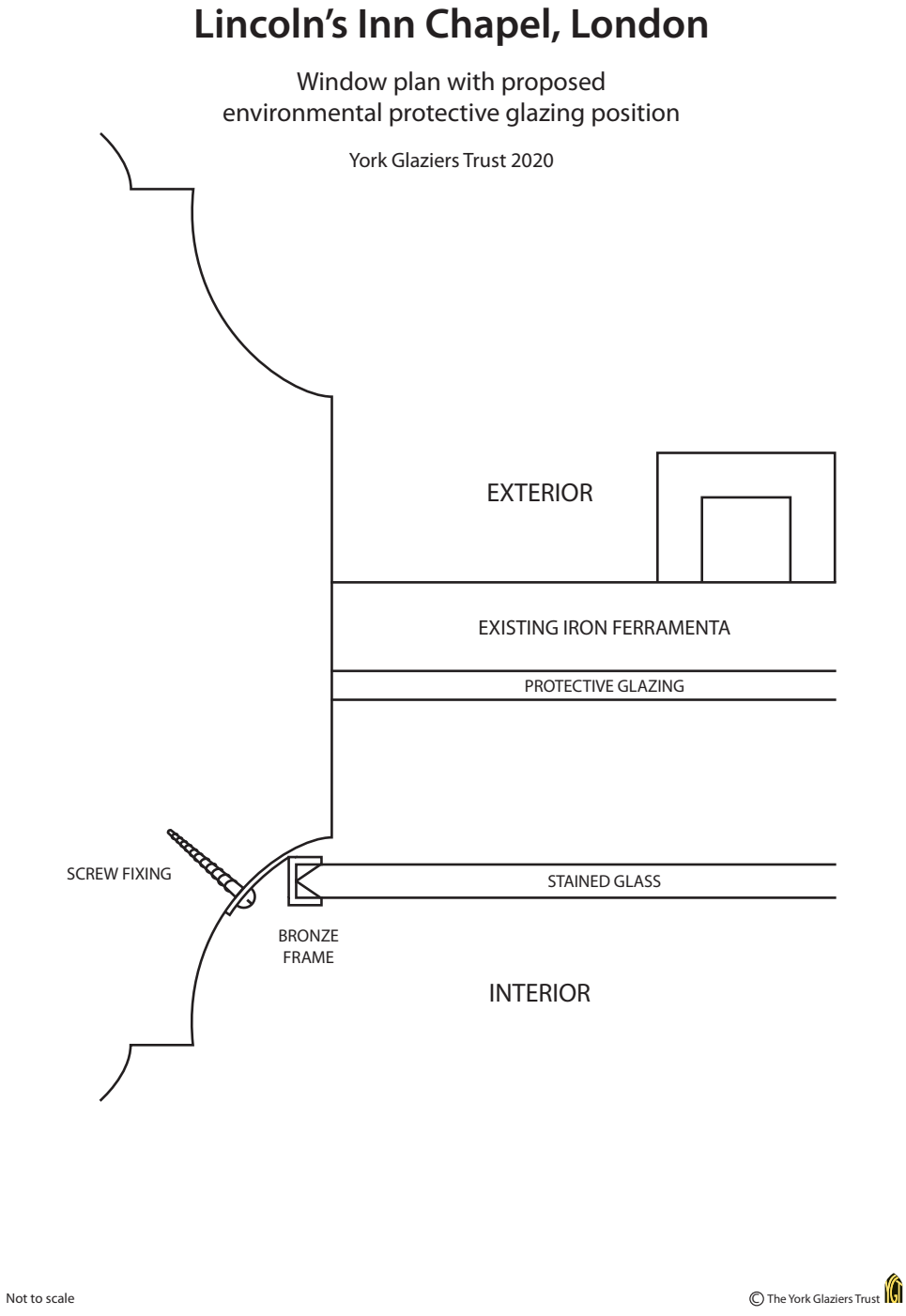

Figure 8.

We propose that the bronze framing system is fabricated with mechanical screw fixings allowing for greater strength and ease of disassembly for periodic maintenance[6]. Both bars and fixing plates for the frames will be set

[6] Teed, 2015

on the exterior to allow for a clean appearance to the frames from the interior viewpoint (see Figures 10 & 11). The frames will be patinated to a dark bronze finish. The system will be designed in such a way as to allow an even ventilation slot at the base and apex of each lancet. Any light glimmers at the edges of the frames will be eliminated by means of a lead skirt soldered to the rear edge of the bronze "U" channel, which will be neatly tamped down to the stone mullion. Recent installations of environmental protective glazing systems by the York Glaziers Trust can be found at Lincoln College Chapel, Oxford (East Window, Abraham van Linge), and at Balliol College Chapel, Oxford (East Window: Composite window containing both sixteenth and seventeenth-century glass), New College Chapel, Oxford (window nVI, William Peckitt, eighteenth-century glass).

Figure 9. Protective glass at New College Chapel, Oxford, window nVI. Note protective leaded lights follow the pattern of the external ferramenta.

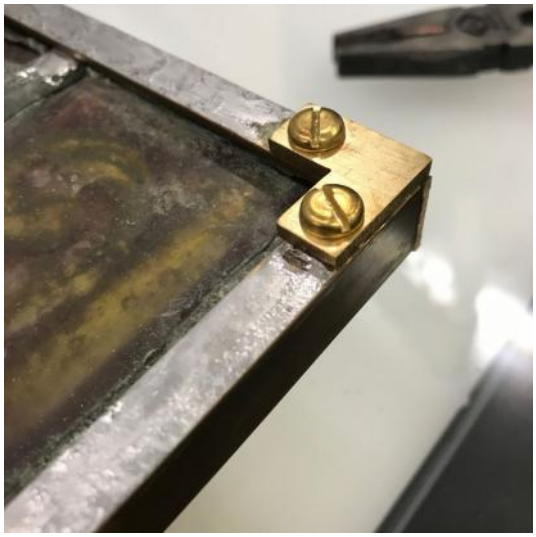

Figure 10. Rear corner fixing bracket to bronze frame.

Figure 11. Rear mounted saddle bars, integral to bronze frame (Balliol College Chapel, East Window 2018).

Figure 12. Frame fixing clip. Phosphor bronze, secured to milled slots in the frame.

Figure 13. Frame assembly at YGT. Lincoln College Chapel, Oxford, East Window by Abraham van Linge.

Figure 14. Lincoln College Chapel, Oxford. East window following conservation by YGT and installation in an environmental protective glazing system, 2018.

Figure 15. Window nIII, Lincoln's Inn Chapel. The existing polycarbonate protection to the main lights, which it is proposed should be removed following the installation of an environmental protective glazing system.

Studio Based Conservation of the Window

The removal of window nIII in order to install an environmental protective glazing system, will provide an opportunity to undertake other essential and desirable studio-based conservation measures. The following processes are recommended:

Removal of the Window and Site Working:

The removal of the window would be conducted by an expert team of YGT conservators, following a thorough risk assessment. The production of a risk assessment and method statement will form part of our pre-site work planning. As the window is heavily secured into the glazing groove using a particularly hard mortar, great care will be taken to establish the safest methodology for its removal. This is likely to involve both the traditional use of tungsten chisels and hand tools in addition to an oscillating Fein tool to weaken the mortar without causing detriment to the glass or stone. As dust will inevitably created by this process the scaffolding should be very securely dust sheeted and sealed on all sides and at the top of the scaffold to ensure that dust does not escape into the Chapel during the works. Ideally the exterior scaffold to the window will also be securely dust sheeted to eliminate the risk of wind pressure forcing dust inwards once panels are removed. The YGT will further endeavor to keep dust to an absolute minimum by a regime of regular vacuuming of dust and mortar debris during the works. The YGT cannot be held responsible for dust that enters the building during the works if the scaffold is not sufficiently sealed. As a precaution the dust sheeting of the organ is advised.

The tracery of the window contains two opening metal casements that have been sealed shut with mortar and are no longer functioning. It is proposed that these should be removed in order to appropriately facilitate the installation of the protective glazing system. As the efficacy of the environmental protective glazing system relies on the free flow of air from within the building, it is critical that the exterior glazing remains sealed and weather-proof. Any ventilation required to the interior of the building should be explored by other means.

Our proposal includes for filling the window space with clear twin wall polycarbonate sheeting, tied to the external ferramenta, and pointed with lime mortar to the exterior glazing groove to weather-proof, as temporary protection whilst the stained glass is undergoing studio based conservation treatment. Upon return of the conserved stained glass, similar sheet protection is advised for the scaffold to avoid dust entering the building. At this stage the existing ferramenta will be prepared and treated with two coats

of Rustoleum exterior metal paint. If necessary any bars exhibiting surface rust will also be undercoated with a zinc-based rust inhibiting primer (Galvafroid is recommended). Protective glazing will be installed and pointed with lime mortar using a graded sand and an NHL2 Hydraulic lime ratio 3:1 (to be confirmed in consultation with the Architect).

Figure 16. Removal of the East Window of Lincoln College Chapel, Oxford (by Abraham van Linge), 2017, by the YGT team.

Cleaning:

The glass is covered by a significant layer of dark, sooty dirt deposits on the interior surface and by more general surface soiling on the exterior surface of the glass. A build up of dirt can be particularly problematic for fragile painted surfaces and the dirt can both attract and retain moisture and potentially microbial growth, both of which can cause severe damage to the decoration and the glass over time. The removal of this surface soiling is therefore highly recommended, particularly as the on-going problem of paint loss, and fragile paint was noted throughout the window. Before any cleaning can commence, a thorough assessment of the panels should be undertaken in the studio using binocular microscopes, in order to ensure that no further damage is caused during the cleaning process.

During the site visit, a cleaning test was undertaken on a piece of glass with stable paint. This revealed that dry cleaning was not effective at removing the hygroscopic layers of grease and dirt on the surface of the glass; however the layers responded well to a wet clean with a solution of de-ionised water and ethanol. Therefore, it is advised that the panels are very carefully cleaned using a mixture of de-ionised water and ethanol, which should be undertaken under a binocular microscope, and using cotton-wool swabs in a rolling motion. In certain areas of dense encrustation, trials would be conducted to establish the most appropriate method of removal. Particular care will be exercised for areas of loose or missing enamel pigment. It is anticipated that the conservation cleaning of the window will lead to a significant aesthetic improvement in the clarity of the stained glass.

Figure 17. Cleaning stained glass from the East window of Balliol College Chapel, Oxford, at the YGT studio with the aid of Zeiss binocular microscopes.

Lead Repair:

The lead is in generally good condition throughout and is thought to date from the restoration of the window during the 1920's by C.E. Kempe & Co. The condition of the leadwork is such that re-leading is neither necessary nor recommended. Any areas of weakness may be repaired with additional lead or solder as required. There are some areas of strap-leading repair to cover glass fractures that are now either loose or missing. These will be addressed during the conservation process where possible by removal and treatment with conservation grade adhesives or where necessary for structural stability by new strap-leading with a finer lead section.

Selective areas of previous lead repair that have left areas of key iconography illegible will be considered for alternative treatment. Where technically possible without risk to the fragile glass some areas of heavy leading will be removed and the glass edges bonded as an alternative. What is achievable will be limited in scope to only what is deemed technically possible and where legibility can be significantly improved. This will be carried out at the discretion of the conservation team following a thorough examination on the conservation work-bench. It may also be technically possible to reduce the width of certain repair leads, to improve legibility by a process of thinning; again at the discretion of the conservator.

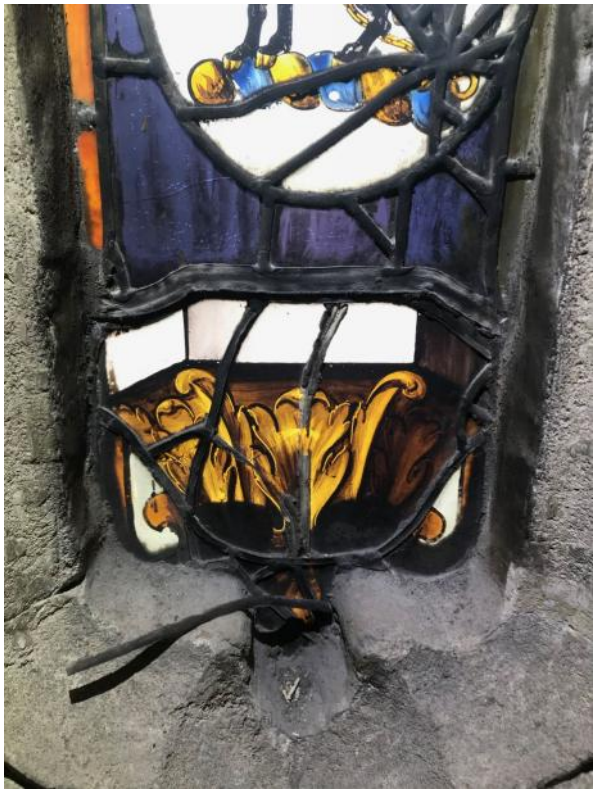

Figure 18. Window nIII, Lincoln's Inn Chapel. An example of a loose strap repair lead., panel B2

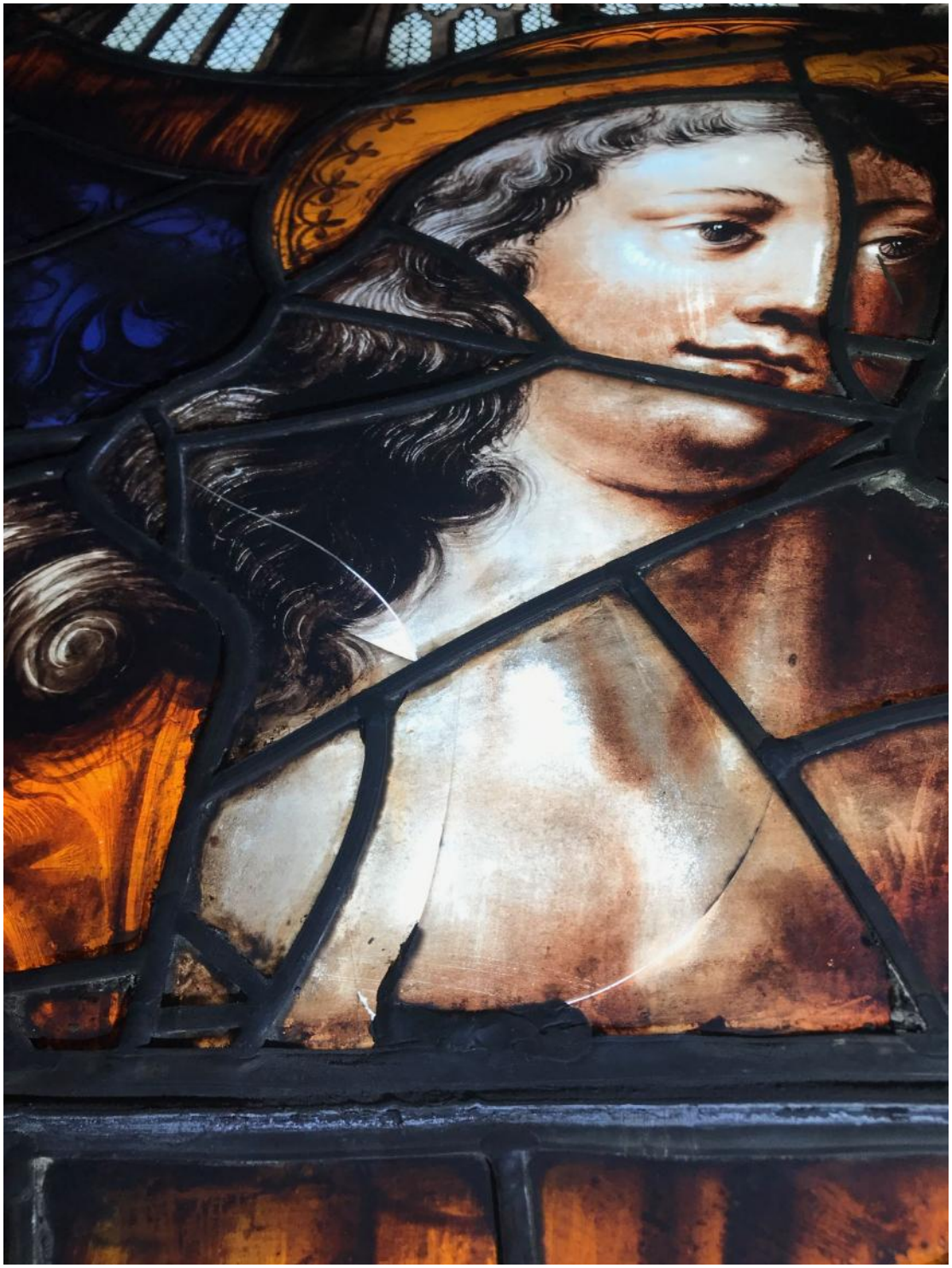

Figure 19. Fractures and repair leads to panel 4d.

Glass Repair:

Single tight breaks with no movement within the lead may be left as they are, especially as with a protective glazing system they will no longer be exposed to wind pressure. Larger areas of damage, areas where there is the threat of losing glass, or instances where the edges of broken pieces rub together causing the glass to shale are all issues that will require further attention. The installation of protective glazing would enable the use of conservation grade

adhesives, and therefore in the aforementioned circumstances, an epoxy resin may be used to stabilise these breaks. In many instances it is possible to undertake this without removing the glass from the lead, but in some cases glass pieces may require 'stopping out' of the lead in order to repair them. This is a localised treatment and would not require the dismantling or re-leading of the panels.

The York Glaziers Trust has extensive experience in the use of epoxy resins for bonding breaks. Conservation grade adhesives such as Araldite 20:20 or HXTAL NYL-1 would be recommended, depending on the condition and fragility of the glass and the complexity of the break.

Documentation:
Full photographic, written and diagrammatic documentation would be undertaken before and after conservation. This provides a record of treatment and both digital and hard copies will be given to the client and will also be archived by the conservation studio. Photographic records will be produced at ultra high resolution using medium format Hasselblad photographic equipment (see Figure 20). Documentation records will also be produced to publication standard as digital files (see Figures 21 & 22).

Figure 20. Studio based photographic recording at the YGT using a medium format Hasselblad H5D camera, and Broncolor lighting equipment.

Additional comments:

Condition and Conservation Record
YORK MINSTER
Eastern Arm Clerestory

Window: **SXI**	Panel No: **4a**
View: **Interior**	

Before conservation

Glass	Lead
Glass crack	Lead tie
MC Multi cracked glass	**Copper tie**
SP Support plate	**Broken or weakened solder joints/lead**
Old adhesive	**Strap lead**
Missing glass	Missing solder joint
S **Stopgap**	Missing lead
S? **Potential stopgap** requires further investigation	**Putty repair**

Surface decoration

Graffito in glass or lead	UP Unstable paint - not flaking
PF Paint flaking	CP Cold paint

Panel Dimensions: Height: 725mm Width: 773mm

Date: October 2019

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Figure 21. An example of a YGT documentation record diagram, before conservation.

Additional comments:

Condition and Conservation Record
YORK MINSTER
Eastern Arm Clerestory

Window: **SXI**	Panel No: **4a**
View: **Interior**	

After conservation

Glass	Lead
A Cracks bonded with Araldite 20:20 resin	**New lead**
Hx **All cracks bonded** with Hxtal NYL-1 resin	New lead flange
Sil All cracks bonded with silicone	Lead infill
GIP Glass infill - painted	**New strap lead**
GIU Glass infill - unpainted	**Lead repair**
SP Support plate (unpainted)	**Lead pared back**
ESP Enhanced support plate	**Strap lead removed**
1 **Glass removed and archived**	SM Stainless Steel Mesh

Surface decoration

CP **Cold paint applied to resin bonds**	GS Gold size cold paint - applied to large areas for tonal purposes

Panel Dimensions: Height: 715mm Width: 743mm

Date: November 2019

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Figure 22. An example of a YGT documentation record after conservation.

APPENDIX

The York Glaziers Trust Studio Profile

The YGT is currently the oldest and largest specialist stained glass conservation studio in the UK.[7] It observes and respects the principles of ethical and technical good practice set out in the International Corpus Vitrearum's Guidelines for the Conservation and Restoration of Stained Glass (Nuremburg, 2004).[8] The YGT team is highly qualified and experienced. Three members are ICON accredited conservators; the studio director is Chairman of the national committee of the Corpus Vitrearum, an expert member and general secretary of the ICOMOS International Scientific Committee for the Conservation of Stained Glass, of which two of the studio team are associate members. Conservation remains at the heart of the YGT's activity. In addition to being the glazing studio for York Minster, the Trust offers its conservation expertise to a broad range of other clients including other Cathedrals and Minsters, Parish Churches, museums, and both private and public institutions. The team has also recently made a number of new commissions for external clients (including Tate Britain) and also has specific experience of integrating historic glass into new designs; two windows made for New College, Oxford have created sympathetic award-winning settings for a collection of historic fragments. The Trust has extensive experience working on windows by the van Linge brothers, having undertaken work to the Bernard van Linge East Window at Wadham College, and the Abraham van Linge windows at Balliol College and Lincoln College.

The YGT adheres strictly to health and safety protocols and follows the guidelines as set down in its Health and Safety Policy (August 2007, with revisions). The staff continue to be well briefed in matters of legal obligation, risk assessment and COSHH. The YGT believes that the safety of the individual goes hand in hand with the safety of the glass.

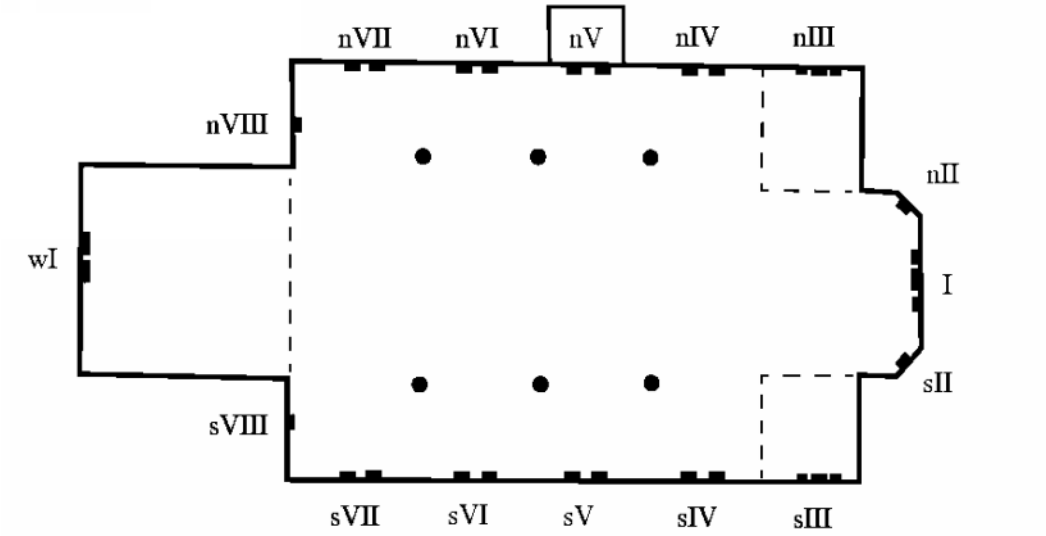
The International Corpus Vitrearum Numbering System

This system for describing the position of a window within a building is widely recognised. It works as follows (see example diagram). Letters are used to indicate position north, south, east or west: in lower-case for lower windows (n, s, e, w) and in upper-case for upper windows [e.g. clerestory level] (N, S, E, W). They are then numbered consecutively, in upper-case Roman numerals, counting from the east window (which counts as I), in

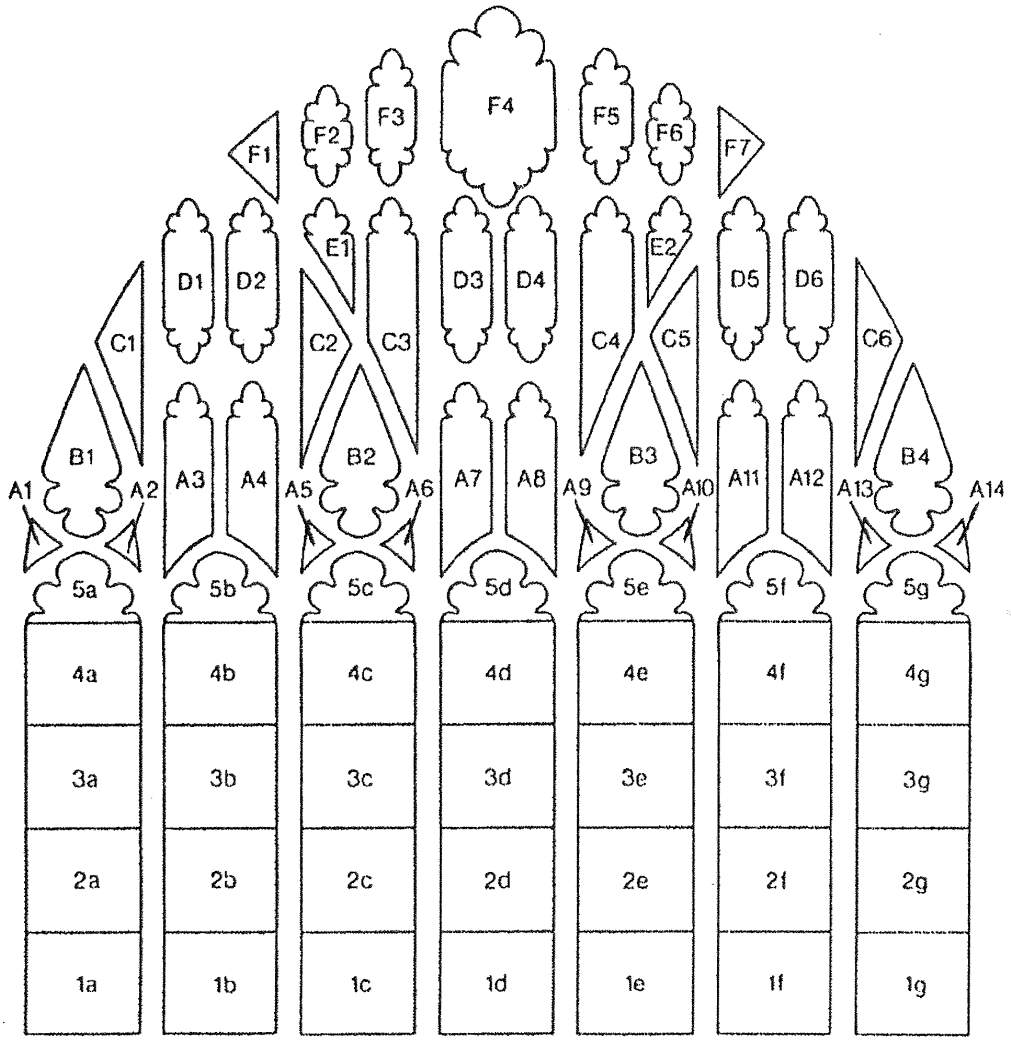
[7] 'The York Glaziers Trust', http://www.yorkglazierstrust.org/?idno=987

[8] Corpus Vitrearum, *Guidelines for the Conservation and Restoration of Stained Glass*, Nuremberg, Second Edition, 2004, Available at http://www.cvma.ac.uk/conserv/guidelines.html

sequences along both the north and south sides. Where there is both a lower and an upper east window, they are denoted eI and EI, respectively; where there is only one east window, this is denoted (exceptionally).



Every stained glass window is made up of one or more panels. The CVMA has a system for describing the position of these within a window. It works as follows: Panels in the main lights of each window are numbered by row in Arabic numbers from the bottom to top, and the light is indicated by Latin lowercase letters from right to left (see diagram, for a sample window). Below is a schematic diagram of a 7 light window with the CVMA numbering of panels.



Additional Illustrations

Figure 23. Tracery sections D1 & D2 as viewed from the exterior, showing existing metal casements.

Figure 24. Tracery panel B3, viewed from the exterior. Note the inscribed position marks, which are possibly original to the panels.

Figure 25. Tracery panel B3. Note cracks and losses of glass in the border section.

Figure 26. Panel B8, exterior view. The crizzled appearance of the glass demonstrates the de-lamination of the blue enamel painted layer from the base glass, which has been exacerbated by environmental damage. Note also that the previous application of shelter-coat to the stone surround has coated the glass edges in places.

Figure 27. Panel B6 exterior view. Mending leads across the heraldic medallion as repairs for previous damages. It may be possible to reduce the profile of these leads to allow greater legibility during the conservation process.

Figure 28. External polycarbonate sheet protection at the apex of lancet “a”. Note the cracking to the stone above the fixing point.

Figure 29. The external ferramenta viewed through the external polycarbonate sheeting.

Figure 30. Panel 2a, viewed from the interior, showing fractured glass and loss of glass. Adhesive residues are visible indicating previous attempts to repair the pieces in situ.

Figure 31. Panel 3b. Paint splashes visible on the stained glass surface.

Figure 32. Panel 5d viewed from the interior, showing extensive mortar repairs to the stone cusps.

Figure 33. Panel 3c, showing glass fractures and strap lead repairs, now loose.

Figure 34. Panel 3c, showing severe enamel pigment losses to the spine of the book and mending leads to the hand.

Figure 35. Mending leads to the medallion in tracery panel B7.

Figure 36. Panel 4b, showing a painted repair to the central section of the face of St Andrew, likely to date from the 1920's restoration.

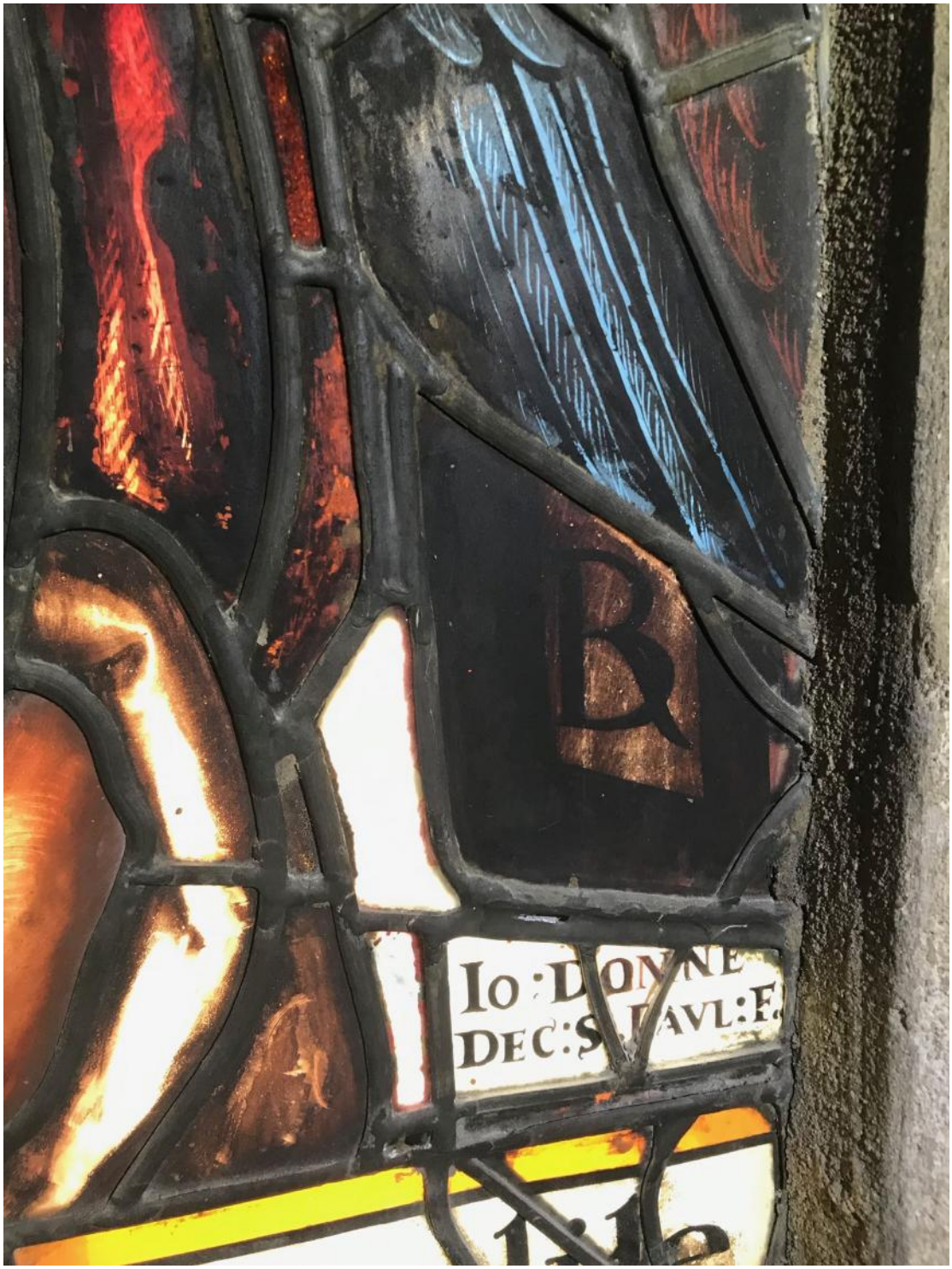


Figure 37. Panel 1d, showing the painted monogram of Richard Butler

Bibliography

Becherini, F. et al, 'Thermal Stress as a Possible Cause of Paintwork Loss in Medieval Stained Glass Windows', *Studies in Conservation*, Vol. 53, No.4 (2008).

Bernardi et al, 'Conservation of Stained Glass Windows with Protective Glazing: Main Results from the European VIDRIO Research Programme', *Journal of Cultural Heritage*, (2012), accessed 21 August 2020: https://www.sciencedirect.com/science/article/abs/pii/S1296207412001896

Corpus Vitrearum, *Guidelines for the Conservation and Restoration of Stained Glass*, Nuremberg, Second Edition, 2004, accessed 21 August 2020: http://www.cvma.ac.uk/CVConservationGuidelines2004.pdf

Georgi, Nancy, A study to assess and evaluate the performance and effectiveness of the recommended protective glazing system for the west window of Beverley Minster: commissioned (unpublished) report, York Glaziers Trust, 2020

Lane, Geoffrey: A world turned upside down: London glass-painters 1600-1660, The British Society of Master Glass Painters Journal, Volume XXIX, 2005

Oidtmann, Stefan, Leissner, Johanna and Römich, Hannelore. "Protective Glazing" (published as 'Schutzverglasungen', in A. Wolff (ed.), Restaurierung und Konservierung historischer Glasmalereien, Mainz, 2000: 167–209), accessed 21 August 2020: http://www.cvma.ac.uk/conserv/glazing.html

Pender, Robyn, et al: Stained Glass Windows: Managing Environmental Deterioration. Historic England, 2020: accessed August 21 2020: https://historicengland.org.uk/images-books/publications/stained-glass-windows-managing-environmental-deterioration/heag195-stained-glass-windows/

Teed, Nick: Bronze Framing for Historic Stained Glass: A New Case Study from the York Glaziers Trust; 2015 published online at https://vidimus.org/issues/issue-88/feature-ygt/

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