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STAINED GLASS CONSERVATION: A FIELD IN FLUX

Mary Clerkin Higgins*

There are often interesting things to be learned from studying the losses in a work of art. Why did they occur? How have they been treated, if at all? What does that tell us about the function of a work and the value placed upon it? While lacunae are an important part of the history of a piece, they can interfere with the aesthetic functioning and appreciation of the work. This paper discusses loss considerations as they relate to stained glass conservation.

Jarrow

At Jarrow in England, fragments of unpainted glass were excavated in 1973 (Cramp 1975). The original method of setting these fragments is uncertain, though a few lead comes (H-shaped lead supports) were also uncovered on the site. Contemporary accounts indicated that window glass at the associated monastery in nearby Monkwearmouth had been leaded together in a glazing undertaken in 675 AD by the Abbot Benedict Biscop and the Jarrow windows may also have been glazed (leaded).

After excavation, the fragments were awkwardly fitted together in a completely conjectural configuration, crudely suggesting a human figure and placed in leads (fig. 1). The result was then put forward, by some, as the "earliest stained glass window."

This "earliest" window would be of great significance if it were true, because, while there are numerous early accounts of colored glass being used to glaze window openings, and several fragments survive, no complete window pre-dates the twelfth century. The edges of this glass are described as being carefully shaped, but the panel makes use of wide leads with significant gaps between the pieces. What we are left with is a group of fragments whose original pattern is not known, that have been placed together to complete some recognizable form.

If one were to accept this configuration of glass and lead, a comparison with comparable objects from the period would suggest that these early artists/craftspeople were not connected with the art of their time, nor were they at all accomplished. While it is very interesting that the fragments exist, it is extremely misleading to present them in their current pattern since what has been put forward would seem to bear no relation to any original configuration of glass or lead. This is an interesting illustration of some of the difficulties faced in the restoration and conservation of stained glass. It is a medium that is made up of discrete parts. Panels can be taken apart, glass can be replaced or re-ordered, and the casual observer may not be at all aware of it, for what they see is, to all appearances, a complete window. The challenge to the

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conservator and art historian is to first discern what has occurred, and then see what is necessary and possible in order to present a window correctly.

An Architectural Art

Stained glass is, traditionally, an architectural medium. In its original location, it is almost always an integral part of the fabric of a building, functioning not only as a work of art, but also as a screen, letting in light and keeping out the elements.

Of the three main components of stained glass - vitreous paint, glass, and lead - the glass and lead are essential structurally, while aesthetically all three play important roles. The loss of any one will impact significantly on the whole. There is not the option of leaving a window in its damaged state on philosophical or aesthetic grounds--a hole exists which must be filled, or soon there will be birds flying around inside the building, as well as light and rain flooding in. The question is not will the hole be filled, but rather, how will the hole be filled.

A variety of methods have been tried over the centuries, but there have proved to be only two reliable, waterproof alternatives in repairing breaks or losses in architectural glass: the replacement of the broken glass, or the insertion of repair leads.

The former means that original material is removed. The latter is unsightly, will begin to confuse the graphic legibility, and may result in glass being cut or ground away ("grozed") along each break line to make room for the insertion of the repair lead (fig. 2).

Modern adhesives have significantly expanded the alternatives, enabling one to achieve effective and unobtrusive repairs both in architectural settings and under museum conditions. Certainly, the function of some windows is purely architectural. They are neither works of art, nor are they historically significant. In these instances it is a matter of general building maintenance and any broken or missing glass would be replaced rather than conserved.

Glass Loss

Glass loss may be attributed to any number of causes -- vandalism, weather (for example, hailstones or hurricanes), various political or religious movements (such as the Reformation and, later, the French Revolution) -- or perhaps to a change in taste.

Restorers frequently take along extra glass (and sometimes glass fragments saved over the years) for emergency repairs on site. Such inserts are intended to be temporary, though they are not always replaced. A "stopgap" is a piece of old glass which is re-used to fill a loss. For example, the head of a figure was found placed backwards and on its side (fig. 3) in an Austrian canopy panel from about 1420 in the collection of The Duke University Museum of Art (1978.20.7). The head was originally from the same group of windows as the canopy, and it is not known when it was inserted here as a stopgap, or what happened to the panel it came from. During the last conservation treatment, the head was removed from the canopy and its gaps were filled where the glass had been grozed with a tinted epoxy resin and then inpainted (fig. 4).

Over time, windows mended using traditional methods can become a jumble of repair leads and glass inserts (fig. 5). While there may be a certain charm to the many insertions in these panels, their arrangement bears almost no resemblance to the original layout. For a number of windows there would be little point, at this stage, in trying to "restore" the glass and lead graphic since so little original material remains.

In Europe, many workshops make use of their glass fragments by piecing them together to fill in windows. The grisaille ensemble, known as *The Five Sisters*, at York Minster Cathedral, England, is composed of many small fragments of glass. It no longer resembles the original grisaille window, which would have had a very definite lead pattern with larger pieces of glass. What is left is actually an assortment of glass fragments which work quite effectively as a large shimmering field of grey.

However, the same approach is much less successful with a figure, and there are many examples of such windows. For instance, in another window at York, a wonderful fifteenth-century head has been glazed together with a body composed of hundreds of fragments of Medieval purple glass and a new border (fig. 6). The artist who created the head would never have drawn such a broken-up figure. While it is understandable that the caretakers would wish to have the head on view, this patchwork approach ultimately does not work since so much is compromised. Glazing together these fragments in this way shows a perfect disregard for the idea behind the original lead pattern. Just as many casual viewers consider it quaint that the Medieval and Renaissance artists drew lead lines across a face (which of course, they did not, as these later leads were used to cover breaks), they will not question this strange assemblage which is the antithesis of the aesthetic pursued by the original artists. Such a fabrication does much more harm than good in fostering an appreciation of the art of stained glass.

In The Field

While there is a growing understanding in the stained glass field of conservation approaches and philosophy, there are still many who would replace original material without a second thought, simply because this is what they have been taught to do in repairing architectural glass.

In one recent instance, a local studio was brought in by museum curators to work on a group of sixteenth-century panels. As the workmen took the glass out of its leads they broke some pieces, yet their attitude was not that they should change their procedures, but rather, that breakage was to be expected and altering their approach would entail a loss of time and money.

Though the conservation department pointed out that they were certainly willing to compensate the studio for the time necessary for a careful job, the workshop maintained that the breakage was not a problem - their glass painter could easily replace the sixteenth-century glass that had broken with newly painted pieces! There was absolutely no understanding of the inappropriateness of this approach.

This relates directly to the purely architectural outlook many studios have. They may not be aware of the conservation issues involved and they only implement the two traditional repair options: the replacement of the glass itself or the insertion of a repair lead. For some architectural glass this might be sufficient, but for much of it, and certainly for any glass in museum collections, this is not appropriate.

In the end, the museum's conservators went to the workshop to glue together the broken glass, since no one there had the skills to do it. The studio still re-ledged the previous breaks just as they found them, rather than eliminating or at least minimizing them. This particular studio's outlook is certainly not unique, but it is also not as pervasive as more and more studios are being exposed to the methods, materials and philosophy of stained glass conservation through articles, workshops, and other means of communication.

Fills

A significant part of any present-day restoration entails determining what glass is original, what has been inserted, and what the original lead lines were. This may involve re-ordering the glass after research and consultation with curators and art historians on the project. Replacement pieces and gaps are usually filled using glass, which is painted, if necessary, with vitreous paints which are then fired in a kiln. These glass inserts are much more stable over time than resin ones would be. They also enable one to better match the missing paint using the original

techniques which may involve the layering of traces, washes and mattes, and brushing and scratching away the dry powdered pigment, all difficult to achieve with "cold" (unfired) paints.

Repairs on glass objects frequently make use of materials which are as transparent or translucent as the glass itself. Resin fills are fashioned to look like the missing area and are attached directly to the original glass. There has been some resistance by stained glass conservators to using this approach, especially when the new fill is of glass. Yet this is exactly what is done in other conservation specialties - a new fill is made, often of the same material used in the original, and joined in a way that is reversible and detectable.

The greatest difference is that glass is translucent and very unforgiving. Because of this, it may not always be appropriate to glue in a fill, but in those situations where it can be done, there is no reason to reject it outright. At times, one may wish to make a clear distinction between original material and later insertions (fig. 7). Here the curator wished to retain the later insertion at the neck of the figure, but not to glue it in. In this instance, the two pieces were copper foiled together.

Glass

The glass itself has many characteristics - color, texture, density, bubbles, striations, to name just a few. While it is not true that Medieval or later glass cannot be duplicated, it is true that it may be difficult or impossible to find in one replacement piece all of the necessary characteristics of the missing glass unless the replacement is custom-made - a very expensive proposition if one can even find a glassmaker to work with who is skilled in blowing and color matching. For the most part, the manufacture of sheets of glass is an industry not tailored to producing small amounts of custom glass.

From the earliest times, stained glass craftspeople have rarely manufactured their own glass. Normally, one group of artisans manufactures the sheets of glass, either hand-blown or machine made, while another transforms the material into stained glass windows. Artists such as Tiffany and La Farge were able to work with small glass factories to produce very unique glass for some of their windows. They passed the considerable cost of this on to their clients. Replacing a glass loss often means going through many dozens of sheets of available glass to find a good match and, as is often necessary, manipulating the replacement with paint or additional layers of glass. Glass may exist that is similar to, but not exactly like the original, which is one compelling reason not to remove original material.

Some losses are due to the composition of the glass itself. In some John La Farge (d.1910) windows, for instance, there are now holes because over time some of the glass developed

numerous cracks which gradually joined together, causing the glass to crumble and fall out of its leads. This particular deterioration cannot be stopped since it is inherent in the glass. The remaining material must be stabilized to prevent more loss and new glass found to match that missing.

Windows composed of more than one layer of glass are said to be plated. One complication in a plated window is that it can sometimes be difficult to know when plating (additional layers of glass) has been eliminated or by whom. The John La Farge window, *Peonies Blown in the Wind* (30.50), made between 1878 and 1881 for Henry Gurdon Marquand's Newport, Rhode Island, residence, and now in the collection of The Metropolitan Museum of Art, had several places where it seemed probable that plating had been removed, since there was still physical evidence on the window of removed plating leads.

One pink cast-glass peony was exceedingly bright and glaring, and from the leads on the back one could see that a piece of plating had been removed. One small petal of the flower still retained its piece of plating behind it. From that petal it was possible to make at least an educated guess that the larger plate had been similar, and then to put on a new plate. In other areas there was no such information, and they were left as they were. It is not known why some of the plating was removed, though there are a number of accounts of plating being taken off American opalescent windows which were considered at some point to be too dark.

Paint

The vitreous paint used on stained glass windows is composed of a low firing glass flux and various metallic oxides, generally iron or copper. After being applied to the glass it is fired in a kiln to approximately 1200° F, at which point the glass flux fuses to the base glass, holding the opaque metallic oxides in place. The paint is used both to control the light and to provide details. Colored glass enamels consist of a lower firing glass flux in which various metallic oxides are either dissolved or held in colloidal suspension, imparting the color. They are usually not as durable as vitreous paints, though the vitreous paint can also fail, due either to a poor composition of the paint, or of the base glass, or to underfiring. Aging and loss are expected, to a certain extent, and have their own aesthetic contributions to make. However, certain losses make a panel very hard to read, at which point one must consider compensating for that loss. The intent is not to make the piece look new, but to make it cohesive where a lack of painted detail is disfiguring. In one panel there may be sufficient information to determine what the missing areas looked like, while in other panels such a determination might be difficult, or impossible.

In a John La Farge panel from the Detroit Institute of Arts (59.170), approximately half of one inscription, "Write me as one that loves his fellowmen," was missing (fig. 8). It was known

precisely what the inscription was and there were still some ghost indications on the glass to guide the layout. A new backing plate of clear glass was cut and painted with the missing half of the inscription. This was fired and then inserted behind the original glass to complete the inscription (fig. 9). The original half of the inscription was then consolidated using Acryloid B72.¹

Lead

The lead has both a functional and an aesthetic role to play. It is used not only to hold the glass together, but also to relate important information concerning the overall graphic design. These lines are usually planned out by the artist and drawn with great care. Losing the pattern or the scale of the original lead network will significantly detract from the effect of the window. As repair leads are inserted to cover breaks in the glass, the original lead pattern is lost and it becomes very difficult to recognize the iconography.

Lead is, in so many ways, the ideal material to hold the glass pieces together, but it has the disadvantage of needing to be replaced every 100 years or so, due to natural deterioration (eg. cracking and fatiguing). At this critical step it is important that the replacement lead be of the same width and profile as the original so that the scale of the window is not adversely affected and painted details along the edges are not covered or obscured.

The fourteenth-century grisaille panel from St. Ouen, Rouen (fig. 10), in *The Cloisters Collection* (1984.199.1-11), had been re-leaded at some point with a wide flat lead which altered the scale of the lead pattern to the overall design of the window and also covered important details. A band of yellow silver stain runs parallel to the leads, but this effect was completely lost with the wide replacement leads. In the most recent re-leading this was rectified (fig. 11).

Conclusion

The traditional architectural approaches to the compensation of losses in stained glass windows - glass replacement or the insertion of a repair lead - are still in frequent use but are often at variance with basic conservation principles. Glass compensation is not the only concern, the glass paint and lead came network have their own compensation considerations. While some windows are strictly functional, none would be harmed, and many would benefit substantially, from a greater adherence by craftspeople in the field to the methods and philosophy of conservation.

Bibliography

Cramp, R. 1975. Window Glass from the Monastic Site of Jarrow. *Journal of Glass Studies* (V17): 88-96.

Endnotes

1. Acryloid B-72 is manufactured by Röhm and Haas Company, Philadelphia PA 19105, and is available from Conservation Materials Ltd., 1165 Marietta Way, P.O. Box 2884, Sparks NV 89431, (702) 331-0582.

Figure 1. Map of "conjectural" leadlines. Glass excavated from Jarrow, England.

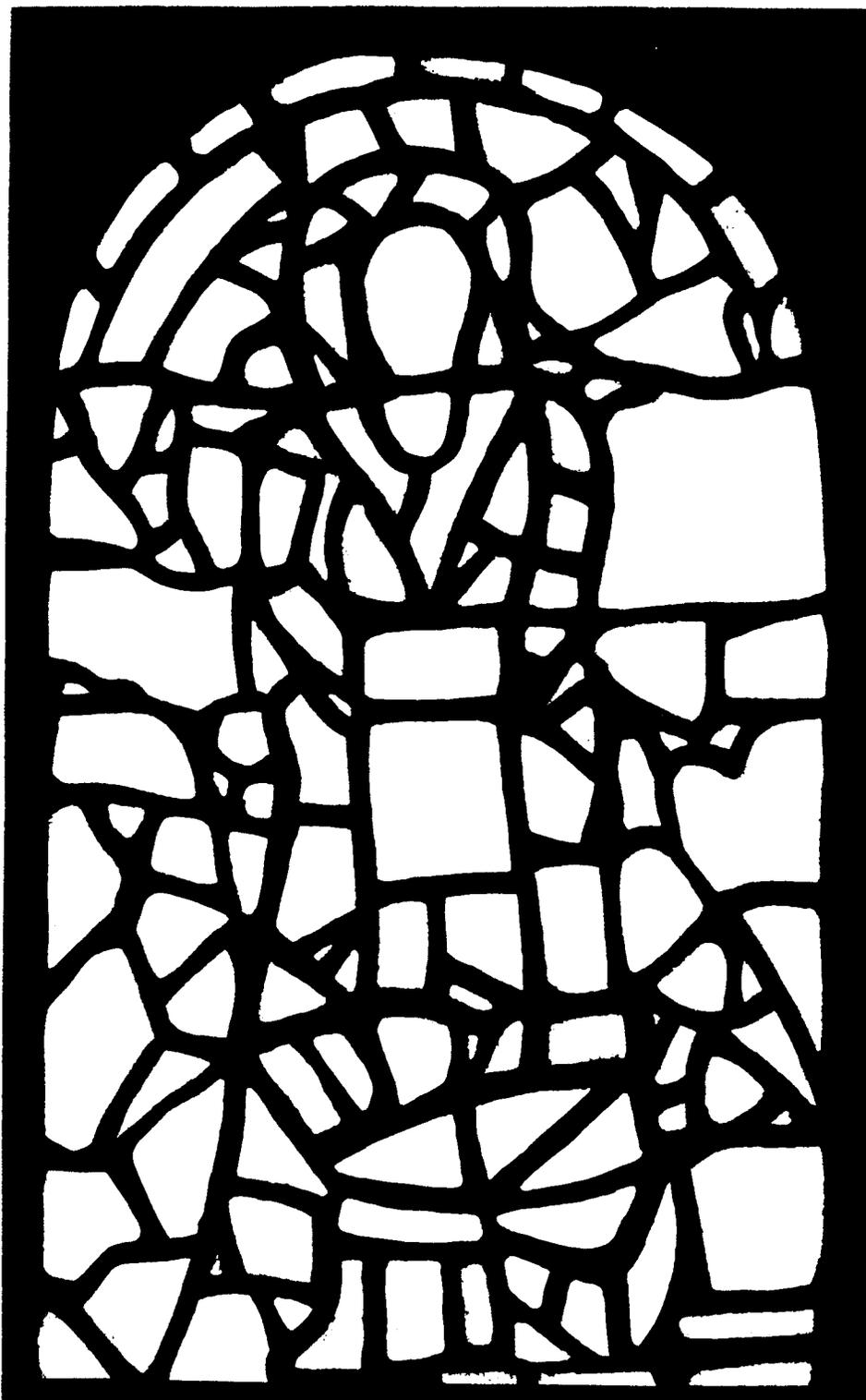




Figure 2. Silver-stained roundel after gap filling, before complete inpainting. The white lines of the fills show how much glass removed after it had broken in order to make room for the insertion of the repair leads. *Ben-Hadid and the Siege of Samaria*, 1525. (MMA, The Cloisters Collection, 32.24.30)



Figure 3. Head of a man inserted on its side and backwards into an architectural canopy section (c.1420), Waasenkirche, Austria. (The Duke University Museum of Art. 1978.20.7)



Figure 4. Inserted head from Figure 3 after cleaning, gluing, filling, and inpainting.

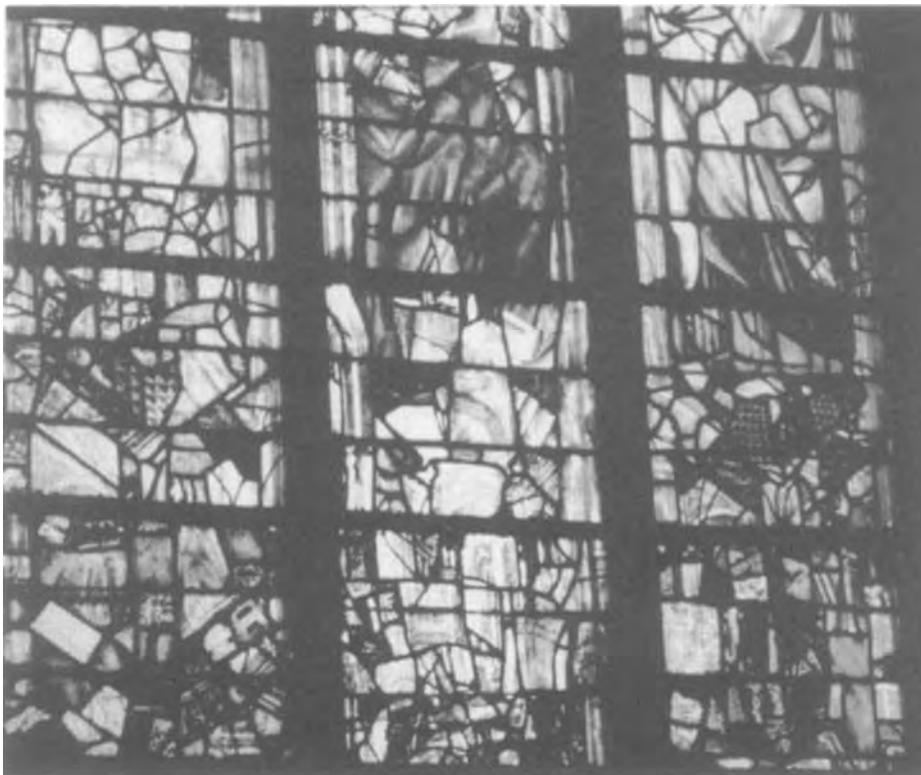


Figure 5. Window made up of glass fragments. Saint Maclou, Rouen, France.

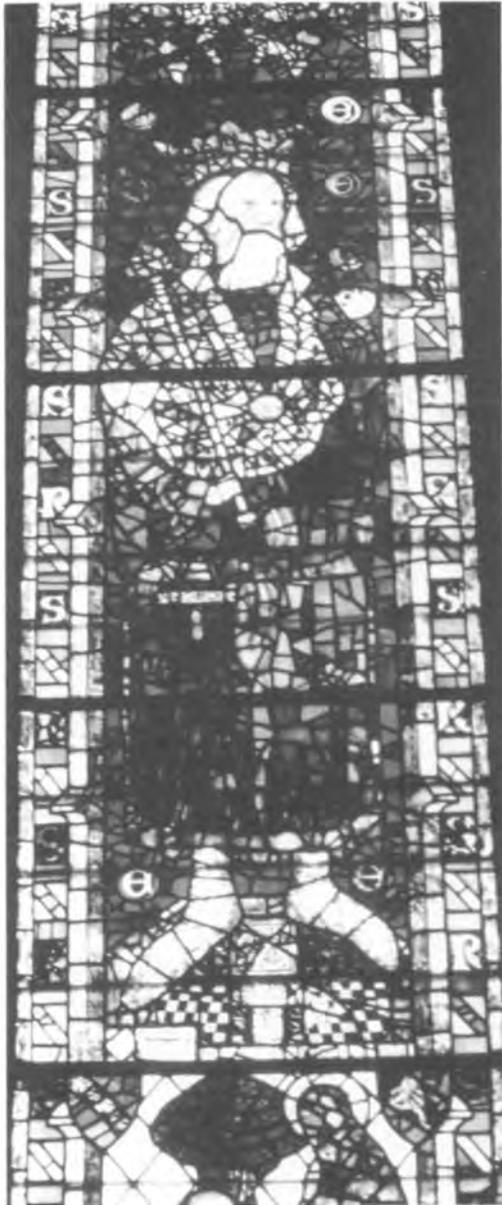


Figure 6. *Edward the Confessor*, York Minster Cathedral, England.



Figure 7. The Virgin's right shoulder is a later replacement. In order to clearly distinguish between the two pieces, they were joined using copper foil rather than an adhesive. *Virgin Kneeling at a Prie-Dieu*; 1552; French. (The Metropolitan Museum of Art, 07.287.12)

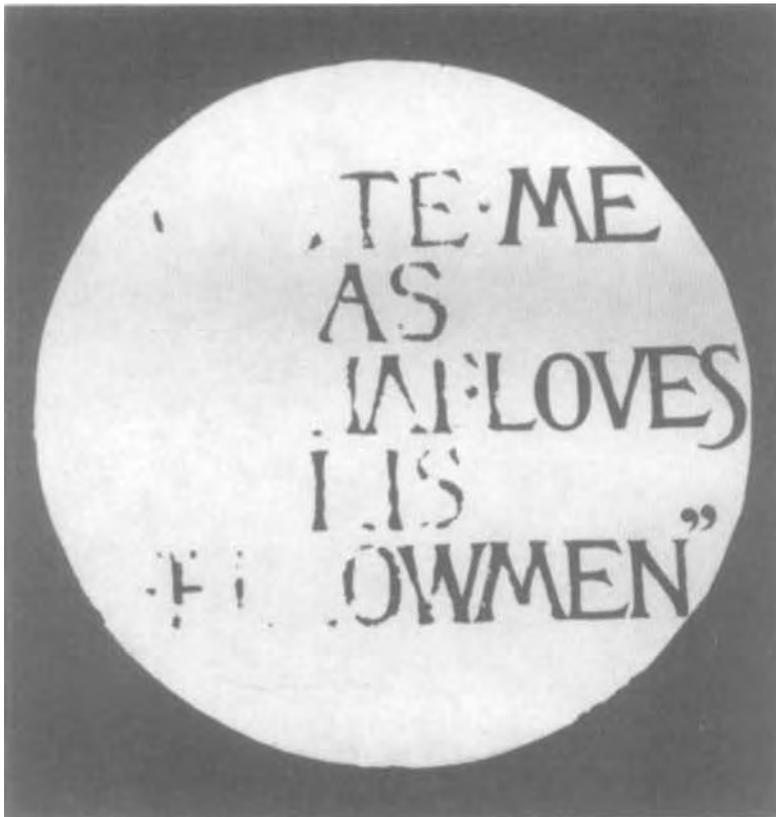


Figure 8. The inscription showing paint loss. *Write Me As One Who Loves His Fellowmen*, John LaFarge; 1889. (The Detroit Institute of Arts, 59.170)



Figure 9. The original inscription together with the backing plate which completes it.

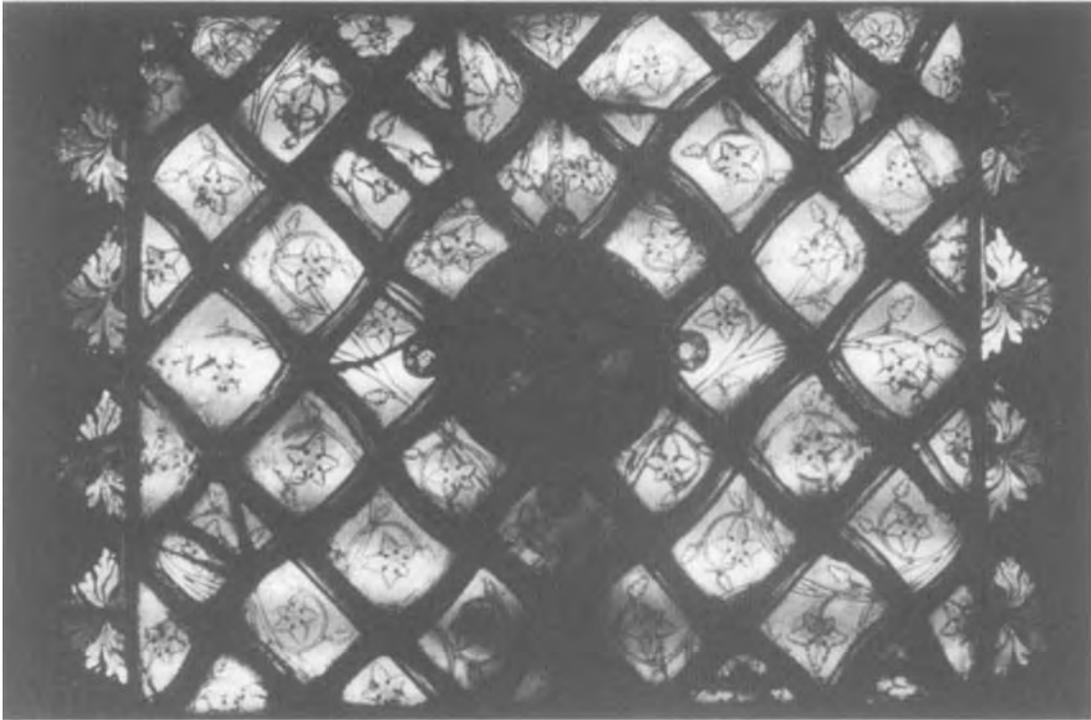


Figure 10. The panel in wide leads before conservation. Note the borders had been attached upside down. Grisaille Panel; 1325; The Abbey of St. Ouen. (MMA, The Cloisters Collection, 1984.199.1-11)

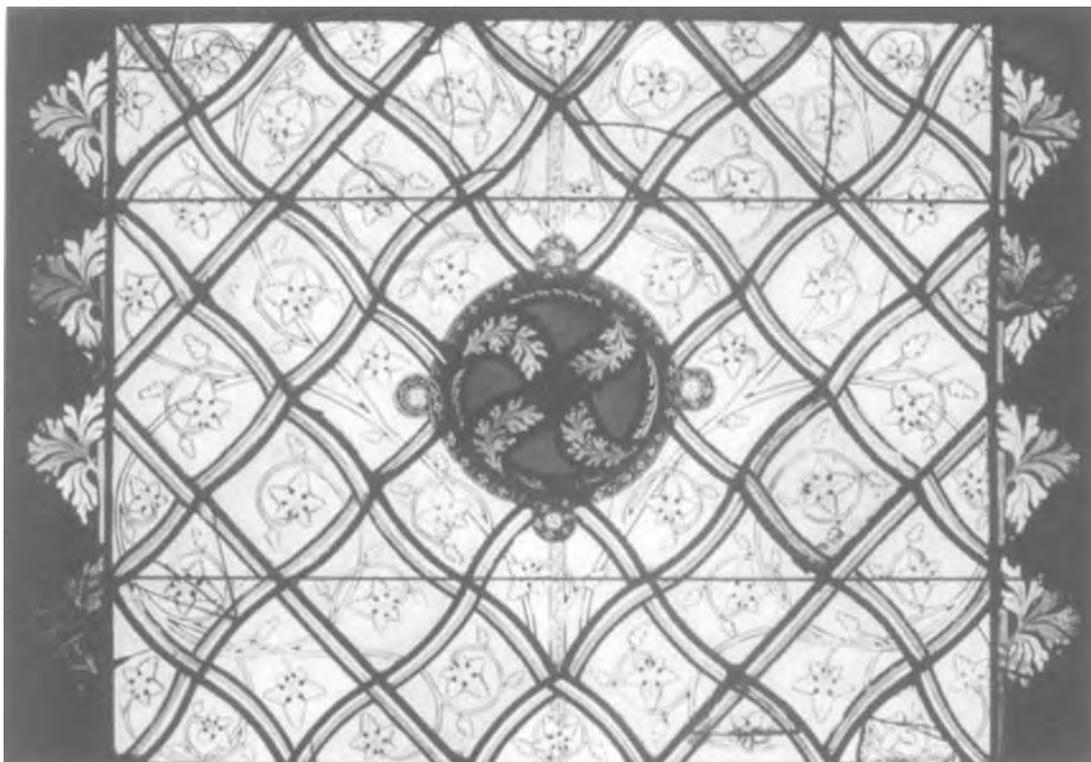


Figure 11. The panel after conservation. It is now possible to see the vitreous and silver stain banding running parallel to the lead lines.