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STAINED GLASS CONSERVATION AT THE ISABELLA STEWART GARDNER MUSEUM: PUTTING THE PIECES TOGETHER

Valentine Talland and Barbara Mangum

Introduction

In the Spring of 1994 the Gardner Museum began the conservation of nine medieval and Renaissance stained glass windows in its permanent collection. This collaborative project involved the participation of no less than six conservation professionals in addition to five art historians. It has been a rewarding but complicated project. It has taught us a great deal about the very specialized nature of stained glass conservation and about the benefits as well as the demands of collaborative projects.

Among the windows that were treated were: a 13th-century window from Soissons Cathedral in Reims, France; four 15th-century and two 16th-century windows from Milan Cathedral; and two 15th-century Austrian windows. This paper will discuss some of these windows to illustrate some key issues that arose during the project that called for a collaborative approach to their resolution.

Collaborators

Because the participants involved in this project are so numerous, they require a brief introduction. The art historians involved are as follows:

Hilliard Goldfarb, the Chief Curator at the Gardner Museum, was very involved with issues of aesthetic compensation and iconography.

Madeline Caviness, a Professor of Art History at Tufts University and formerly the President of the Corpus Vitrearum, the international organization of scholars formed after WWII for the purpose of cataloguing all European stained glass in Europe and North America.

Marilyn Beaven, is a researcher for the Corpus Vitrearum and Madeline's graduate student. She wrote her Master's thesis on the Gardner's Soissons window and knows the window better than any living scholar. Madeline was involved in all aspects of the treatment of all the windows. Marilyn was involved principally with the treatment of the Soissons window. Both reside in the Boston area and their proximity was a real asset in this project because it was relatively easy to meet with them with the windows to discuss the treatment.

Caterina Pirina, an art historian at the Duomo Museum of Milan, first published the Gardner's Milanese windows. Ernesto Brivio, the Director of the Duomo Museum, is very familiar with
the Gardner's Milanese windows. In contrast with Madeline's and Marilyn's proximity, the relative remoteness of our Milan consultants complicated the project. It was very difficult to discuss issues of aesthetic compensation and iconography when the key consultants had only photographs to work with.

A number of conservation professionals were also involved in the project:

**Barbara Mangum** and **Valentine Talland**, conservators at the Gardner, supervised and coordinated the project.

The work was contracted out of the museum to **Bill Cummings** of Cummings Studios, specialists in stained glass restoration. This was done in large part due to the specialized requirements of stain glass restoration and the difficulties in dealing with lead. Bill Cummings in turn, at the Museum's request, then sub-contracted the actual treatment to **Marie-Pascale Foucault**, an independent restorer of stained glass who had previously worked on contract for the Metropolitan Museum of Art and the Cloisters among other clients. She has expertise in the treatment of early glass, and, in particular, French glass as well as being a highly skilled glass painter. She did her work at Cummings Studios in North Adams, MA. Bill Cummings managed the project from his end, coordinating the schedule of completion, overseeing the accounting, and providing high quality and safe working conditions. One major advantage of this arrangement was that it kept the windows fairly close to the Gardner Museum. We could drive out to Cummings Studios on a regular basis to consult on the treatment and monitor its progress. This turned out to be critical during the course of the treatment, because it would have been impossible to make decisions about the scope of structural and aesthetic treatment without seeing the windows in person.

**Dieter Goldkuhle**, an independent stained glass restorer in Reston, VA, was brought in on Madeline's recommendation to consult on the structural treatment of the Soissons window.

**Gene Farrell**, a conservation scientist at the Straus Center at Harvard, was contracted for the compositional analysis of the lead cames from some of the windows.

Below is a diagram of how we had envisioned our relationship with our contractors and consultants at the beginning of the project. As the owner, we would manage the project and coordinate communication among all the collaborators. In this way we felt that we would be party to all important discussions and thus be able to make the most informed decisions.
As it turned out, the following diagram more aptly conveys how things actually worked. As the windows were being worked on, and specifically being taken out of their leads, there was a flurry of excited discussion between the contracted conservator and the consulting art historians. Although they were not deliberately excluding the owner, we had to work hard to be kept in the loop. Moreover, although the contractors were working for the Gardner Museum on this project, as stained glass restorers their relationship with the Corpus Vitrearum staff would long outlive the treatment of the Gardner windows. Although the contractors' commitment to the owner was never in question, their relationship with the Corpus Vitrearum staff did complicate our position as the project manager.
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Stained Glass Components

Leaving aside the collaborators for the time being and turning to the treatment of the windows, it may be useful to review quickly the various components of stained glass in order to facilitate the discussion. The Gardner windows are composed of individual pieces of colored glass; the color results from metal compounds added to the glass in manufacture. Most of the glass is further decorated with a vitreous dark paint, or grisaille, which is fired onto the glass surface. Some glass is also decorated with a fired yellow silver stain. Most of the grisaille and silver stain is original, although on many of the Gardner panels there are isolated areas of 19th-century grisaille and silver stain. The glass is held in place, or glazed, with lead came which were originally putted with an oil-based glazier's putty. After restoration, all the panels have been housed in rigid brass frames that are slightly over-sized to allow movement of the glass and lead. Finally, the panels of the Soissons window are installed in a structural stainless steel armature.

Treatment of the Soissons Window

In many respects, the real cornerstone of this project was the monumental Soissons window made in 1205. It is known as the Lives of Sts Nicasius and Eutropia window and it depicts part of the legend of the martyred brother and sister saints whose cult was local to the region of Reims. This window has been identified by the Corpus Vitrearum as probably the largest, most complete medieval window in an American museum collection. It was installed around 1910 by Mrs. Gardner in her Chapel gallery.

At the beginning of this project the glass and paint in the Soissons window were in remarkably good condition. However, this window was in urgent need of conservation because it was structurally unstable. The lead came had buckled severely out of plane. Figure 1 is a schematic graph of the window. It illustrates the actual measured deformation of the window in 1993. In one area of the window, the maximum deformation was 3.6 cm. In short, the window had buckled substantially out of plane and was severely at risk.
One cause for the planar deformation was the weakened condition of the lead in the cames. The cames are of the 19th century; the entire window was reglazed in the mid-19th century by a French restorer named Didron. On the surface of the lead there was extensive white pitting. It turned out that the corrosion, rather than being just on the surface, had penetrated throughout the cames causing them to be very weak and brittle, and raising the question of the need to re-lead the entire window.

It seemed likely that the degradation of the cames was related to the lead alloy composition. Our collaborators had observed that 19th-century lead cames are frequently much weaker than their medieval counterparts. One explanation for this may be too low a percentage of silver and/or copper in the 19th-century lead composition; that is, there is a critical minimum
percentage of silver and/or copper essential for the long-term stability of lead cames. It is thought that in 19th-century Europe, silver, naturally present in lead ore, was extracted from the baser metal for other uses in order to exploit as fully as possible the value of the ore. We thought it would be useful to look at the composition of the Soissons window cames. Gene Farrell at the Straus Center did the analysis. As a side note, we have had the leads of most of the Gardner's windows analyzed and hope to begin sometime soon a preliminary study of antique and 19th-century lead cames.

The table below on the left shows the percentage by weight of some of the metals present in the 19th-century Soissons window cames. The table on the right shows the standard specification for copper-bearing lead cames provided by the American Society for Testing Materials. These are specifications for lead predicted to have a lifetime of more than one hundred years. The ASTM standards indicate that silver should be present up to 0.02% by weight and the minimum copper present should be 0.04% by weight. In the Soissons window samples, however, there is no silver present and the copper is present in percentages less than 0.04%. The 19th-century cames in the Soissons window contained below the minimum recommended percentage of copper and silver, they were also visibly very weak and we had serious reservations about their stability.

<table>
<thead>
<tr>
<th>Soissons Window lead composition (%)</th>
<th>ASTM lead composition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lead</td>
</tr>
<tr>
<td>sample #1</td>
<td>99.58</td>
</tr>
<tr>
<td></td>
<td>lead</td>
</tr>
<tr>
<td>sample #2</td>
<td>99.79</td>
</tr>
<tr>
<td></td>
<td>lead</td>
</tr>
<tr>
<td>sample #3</td>
<td>99.09</td>
</tr>
</tbody>
</table>
A critical aspect in the treatment of the Soissons window turned out to be the decision to remove the 19th-century lead camees and re-lead the entire window with more structurally stable camees. Prior to making the decision, however, we brought in an additional expert stained glass restorer, Dieter Goldkuhle, to examine the leads and consult on the decision. It was extremely important that all possible alternative treatments be explored because of the risks associated with re-leading the window. Re-leading puts the glass at risk for damage and possibly being misplaced; also, each re-leading takes the window one step further from the original; and the appearance of the re-leading might not have been aesthetically as successful as the 19th-century work which was very good. On the other hand, there were also corresponding benefits. There was no question that re-leading the window in high quality lead camees would extend not only the life of the window but also the efficacy of a conservation treatment that in all likelihood the museum could not afford to repeat in the near future. Moreover, it gave the Corpus Vitrearum scholars the opportunity to examine the cut edges of the glass, which resulted in two major discoveries: first, it lead the scholars to increase their estimate of the number of pieces of original 13th-century glass and second, their examination allowed them to ascertain the original conformation of the structural armature.

By examining existing windows in the Soissons Cathedral, we had observed a number of armature conformations, but these armatures are not all original. Thus, without the examination of the glass we could not have known conclusively the original shape of the armature of the Gardner window. Since part of the treatment included building a new structural armature at the cost of some $10,000, we were glad to have as much information as possible. Ultimately, all the collaborators were satisfied with the decision to re-lead and agreed that the necessary investigation of choices had been pursued.

Treatment of the Milan Cathedral Windows

In 1865, Mrs. Gardner purchased six windows from Milan Cathedral. Many windows had been removed from the Cathedral in the 1830's in order to be restored. The contracted restorer, Giovanni Bertini, painted some 48 panels de novo to replace the originals while they were being restored. However, Bertini ended up restoring very few panels, preferring to paint new ones. In 1869, the Cathedral stewards called upon Bertini's sons to make an inventory and to restore the original windows which had been piled up in a warehouse for some 40 years. They did complete much of this work, but many of the windows were never re-installed and it is presumably from this cache that Mrs. Gardner's windows emerged.

While studying stained glass windows, the Corpus Vitrearum scholars identify and mark what is original glass and what is restoration. To do their documentation, they take a black and white photograph of the window and then overlay onto each piece of glass various patterned markings. Each patterned marking indicates whether the glass is original or a restoration (see Figure 2). The various restorations are subdivided by type (each has a different patterned
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marking). During our project we were particularly concerned with three types of restorations: first, nineteenth century glass fills with nineteenth century paint; second, the so-called "stop-gaps" which are fills of antique glass contemporaneous with the panel but probably originating from another panel; third, palimpsests that are the same as "stop-gaps" - that is, they are spurious pieces of antique glass - but they have additionally been repainted in the nineteenth century.

![Corpus Vitrearum Restoration Charting Symbols](image)

Figure 2. Corpus Vitrearum Charting Symbols.

One of the Gardner windows to be treated was a sixteenth-century window titled *Ruth and Boaz*, attributed to Corrado Mochis. However, the title is a bit of a red herring because the narrative is still unidentified. Figure 3 shows a before treatment view on the left and after treatment on the right. Note the piece identified with the arrow. This piece of glass is an antique piece contemporaneous with the panel, but it did not originally belong in this position and very probably not in this window.
This piece of glass had been identified as a stop-gap and it had the unfortunate effect of turning this female figure into a bearded lady. Madeline Caviness from the *Corpus Vitrearum* was very opposed to removing any stop-gaps during the treatment of the windows. She feels that this stop-gap is a part of the history of the window, that it is contemporaneous with the window and may come from an unidentified panel in the same narrative series, and that it has informational value in its place in the window. The Gardner is respectful of these considerations but at the same time has an obligation to its visitors to make the windows readable, as presumably they originally were. Much effort was made to determine what the original iconography was. It was posited that it might have been a scene of Jacob about to put on the animal pelt given him by Rebecca in order to deceive the blind Isaac. Thus, the central figure would have to be interpreted as a young man; in this case the piece of hair glass might make some sense in the composition. In consulting with the Milan scholars they were unable to concur with or reject this interpretation. They found no parallels by the same painter that might belong to the same narrative series.
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At this point the Gardner's Chief Curator decided that the stop-gap was too confusing in its current position and that there was no reason to believe that the piece of glass belonged in the window. So we began to investigate how this part of the window could be reconstructed if the offending piece of glass was removed. Using computer graphics software, several mock-ups of proposed reconstructions were made. These mock-ups were circulated to all the collaborating art historians. Some modifications were made were in order to arrive at the after treatment state shown here. The museum is very happy with this treatment. We feel confident that the museum can provide a safe and permanent home for the removed piece of glass where it will be available to scholars for study. Madeline Caviness is less satisfied with the compromise. Incidentally, we offered to give the stopgap to the Duomo Museum in Milan in the event that they might find the panel to which it originally belonged. Their response was that they would be happy to receive the piece of glass and that they would probably use it as a stopgap in another panel. In light of this, the Gardner chose to keep the glass.

In another of the Milanese windows, *The Washing of the Feet*, a 19th-century restoration raised a perplexing conservation issue. The piece in question is a 19th-century piece of glass with 19th-century paint. It was probably done by Pompeo Bertini sometime between 1869 and 1875. Bertini was an exponent of "historic restoration" and is well known for his efforts to reproduce as best as he was able the style of the 15th and 16th-century painters whose glass he repaired. Indeed, Mrs. Gardner's panels have been praised by stained glass scholars as illustrating "the most important moments in the history of the cathedral's stained glass, from its origin in the 15th century to its wholesale restoration by the Bertini family in the 19th century." ¹ So there is clearly historic value to this piece of restoration glass. Unfortunately, when this panel was re-leaded and the original glass re-aligned, this restoration piece of glass no longer fit. The dilemma was as follows. On the one hand, we could have removed the glass and stored it *in toto* safely at the museum with the treatment documentation for the window. Then we would have had Marie-Pascale, a highly talented glass painter, cut a new piece of glass that fit and have her paint it in the style of the original or perhaps in the style of the Bertini restoration. On the other hand, this 19th-century piece could be cut down to fit and remain in the panel thus preserving the Bertini restoration, albeit no longer complete, in its historic position. Neither was an ideal solution. In this incidence we bent to the strong urging of Madeline to keep the piece in its historic context in the window, so it was cut down a full inch along one side in order for it to fit.

Treatment of the Austrian Windows

The last two windows in this project are two Austrian panels (Figure 4) which were made to commemorate the marriage of Lienhart Jochl to Dorothea Hungerhausen on the right. They were painted around 1490. They are inscribed along the bottom, "Lienhart Jochl 1490". The photograph below was taken before treatment. The issue of cold-painting in stained glass
Cold-painting had been carried out throughout the treatment of the windows to inpaint epoxy fills. The medium selected was Acryloid B-72 because it is easily reversible, and, although a new medium to Marie-Pascale, one she found easy to use. Moreover, in the Gardner Museum ultraviolet light is filtered by the exterior storm windows, so the B-72 medium can be expected to be relatively stable. In approaching the Austrian windows we knew we would not inpaint areas of damask pattern, because these patterns can be critical in establishing date and provenance. There is an example of one such painted damask being discovered in an actual 15th or 16th-century fabric in a cope from Burgundy. So the damask patterns have to be treated as a document.
The inscription along the bottom, however, was an area that the Gardner Museum had hoped
to recover as a decorative element with some cold-painting. We felt it was important for
visitors to be able to interpret this worn area as script. We even have an excellent document
of how the inscription looked earlier in the history of the museum: a photo taken in 1959
shows that at that time the original grisaille in the inscription was virtually intact. However,
according to the Corpus Vitrearum standards, were we to cold-paint in the loss on this
original piece of glass - even in a reversible medium - they would reclassify the entire piece
of glass as a restoration. Their system has no way of distinguishing between inpainting and
repainting on an original piece of glass. Madeline is adamantly opposed to inpainting on this
glass. She would prefer using a plating technique in which a modern piece of glass is painted
and then is glazed in with the original piece. We at the Gardner are opposed to plating
techniques because of the risk of forming a micro-climate including condensation and
promoting more damage to the paint and glass. At some point, plating had been put onto
these windows in a misguided attempt to protect the glass. In 1990 we removed the plating
and discovered severe damage to the back of the glass and paint as a result of moisture that
had been trapped behind the plating.

We have not yet fully resolved the issue of cold-painting the inscription. For the time being,
we intend to re-install the window without any inpainting and see how it looks. It no doubt
will look much better simply as the result of its cleaning and treatment which has, among
other things, removed unsightly repair leads.

Conclusion

It is clear that in order to achieve the best possible treatment for the stained glass it was
absolutely necessary to consult all the appropriate experts and to make an effort to assure
each that their opinions would be respected. On the surface this had seemed simple; after all,
we all shared the same objective: the preservation of the windows. On a more profound
level, however, it emerged that we did not always share a view of the means by which the
objective would be achieved.

We discovered that we had very different perspectives on preservation. Our Corpus
Vitrearum colleagues were much more interested in maintaining things as they were and we
were interested in making the windows beautiful as well as stable. They treated the windows
as information and we regarded them as fine art. Moreover, prior experience with a long
history of stained glass restorations had made them very wary of all restoration and
conservation, and they tended to lump the two together. There was a real communication gap
when it came to discussing modern conservation materials and techniques. This perhaps
points to a need for our profession to engage in more communication with our affiliated
fields. At one point, our Corpus Vitrearum colleagues presented us with a copy of the
Charter of Venice. It seems that they assumed that we were not already familiar with it. We
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should probably provide them with a copy of the AIC Code of Ethics.

As the owner in fact of the windows we also had to allow that all our collaborators made a claim to an "ownership" in spirit of the project. The positive side of this is that it indicated a real vested interest in the project and a sense that each of us was leaving a permanent legacy to these windows. On the other hand, it also meant that everybody's reputation was also vested in the treatment. Sometimes this attitude resulted in a certain rigidity of position when difficult treatment choices had to be made. In the end, we were able to meet somewhere in the middle on most issues, but it meant addressing each question as a unique situation, opening it up for discussion, and ultimately being very patient.

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Endnote