



*Figure 1: The girandole before treatment.*

# The Examination and Treatment of an American Gilded Girandole, ca. 1830

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**ABSTRACT:** An American gilded girandole convex mirror, dating to approximately 1830, was examined and treated in the Philadelphia Museum of Art's furniture conservation laboratory. The girandole frame, gilded in contrasting matte oil and burnished water gilding, was in unusually well-preserved condition, although it was very dirty, had been liberally restored with bronze paint, and suffered several areas of substantial loss.

Technical examination of the piece was conducted using cross section fluorescence microscopy and X-radiography. Examination was focused on three subjects; the condition and originality of the gilding, the condition and originality of the gilded compo eagle surmounting the frame, and the original configuration of the now missing gilded balls and chain.

Treatment of the girandole fell into three broad categories; consolidation and cleaning (including the removal of bronze paint), filling and replacement of losses (including fabrication of replacement balls and chain), and ingilding and inpainting.

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## Background

**T**HE TERM GIRANDOLE HAS BEEN USED to describe several different types of object through the centuries. In the 17th and early 18th centuries, the term typically referred to any type of wall-mounted lighting fixture, with one or several candle arms, and a mirror to reflect the candle light back into the room. In the late 18th and early 19th centuries, the term girandole came to refer to a round, gilded frame, either with or without candle arms, holding a convex mirror. An American gilded girandole, dating to about 1830, was examined and treated in the furniture conservation laboratory of the Philadelphia Museum of Art (*fig. 1*). Stylistically, this girandole, which is one of a pair owned by the Museum, relates closely to the labeled work of Charles Robinson of Philadelphia (active 1811-1857), and a tentative attribution to Robinson has been made by the Museum's curator.

## Description

The girandole frame is constructed of wood, with an iron wire and nail armature supporting elaborate composition ornament. The round molded

frame section is of laminated wood construction, presumably lathe-turned to its final profile. There are thin pieces of wooden armature which run vertically from the top of the molding up to the base of the eagle, and down from the bottom of the molding to the lower pine cone finial. The heavy gauge iron wire and sizable cut nails have been anchored into the wood frame to provide support for the molded composition (a moldable putty, typically made of calcium carbonate or calcium sulfate, linseed oil, rosin, and hide glue). The composition ornament includes an eagle, grape clusters, pine cones, and elaborate scrolling acanthus forms. There is a candle arm with cut glass *bobèches* and turned brass candle holders extending forward from each side, near the bottom of the frame. The twisted decoration on these candle arms is also made of composition ornament, molded onto an iron wire armature. The entire girandole is gilded in contrasting matte oil gilding and burnished water gilding. The girandole would originally have had gilded balls and chains swagged across its front; however, neither of the pair of girandoles retained any balls or chain.

## Condition

In general, the girandole was in good condition. There was a significant accumulation of dirt and soil on the surface, and in a few localized areas, the gilding exhibited some minor flaking. The girandole had been liberally restored with bronze paint, which had since darkened considerably and was quite disfiguring. There were several areas of substantial loss, including a large acanthus leaf element just above the molded wooden frame at the center; a large section of the twist decoration on the proper left candle arm; and the total loss of the gilded balls and chain which would originally have hung on the frame.

## Examination and Analysis

### The Gilding

Six small samples were taken from the surface of the girandole for examination by fluorescence microscopy. These samples were embedded in polyester resin, polished, and viewed under the microscope by visible light and ultraviolet induced visible fluorescence. Sections revealed that, in water gilded areas, the wood and composition substrate had been coated with a moderately fine gesso layer, and then prepared with a medium-gray colored bole. In oil gilded areas, surfaces were prepared with a yellow pigmented size applied directly to the composition. Results supported the supposition that approximately 70% of the surface of the frame presented original surface and that much of the areas covered by bronze paint (about 20% of the surface) retained original surface below.

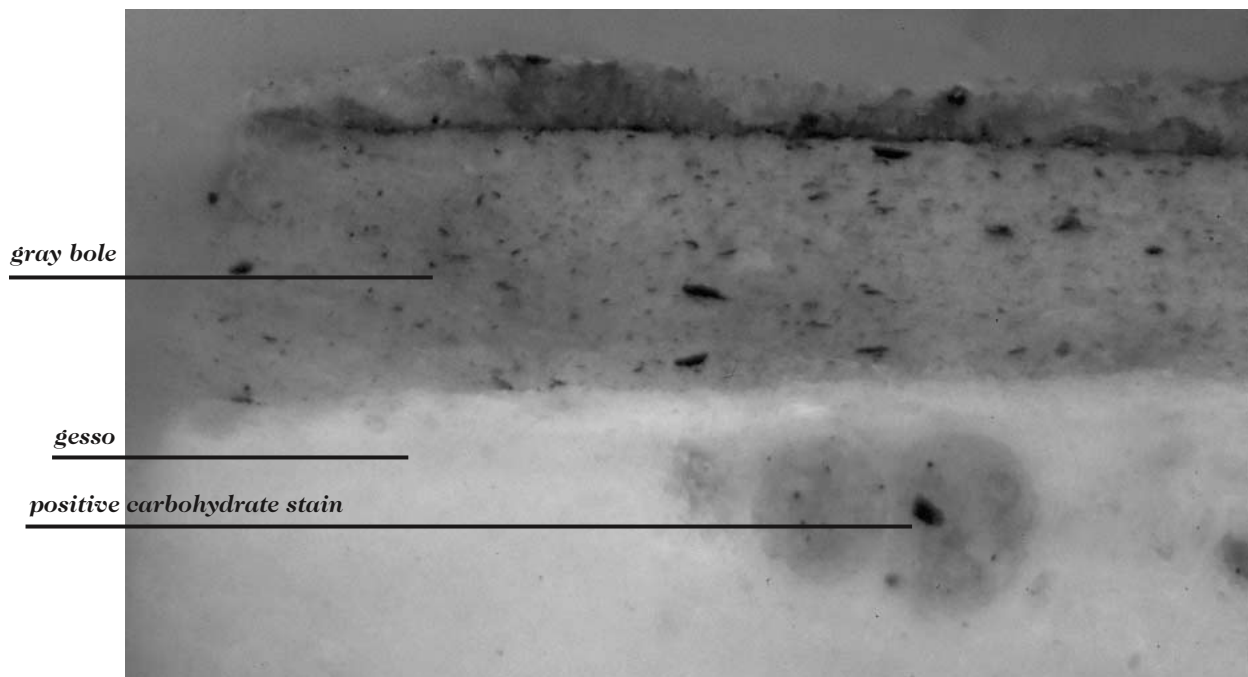
### The Eagle

The only area of the frame which appeared to have been heavily reworked was the eagle. Examination of the sample taken from a water gilded area of the eagle revealed at least one complete re-gilding of the eagle in the past. At this time it was noted that the gray bole from the uppermost (presumably restoration) gilding layer on the eagle was quite similar to the (presumably original) bole found elsewhere on the frame. Furthermore, it was noted that the preparatory layers for the lower gilding layer (presumably original) on the eagle were a dark green, almost black color which was not observed anywhere else on the frame. Some consideration was given at this time to the possibility that the eagle might have been purchased in a gilded state from a specialist ornament maker

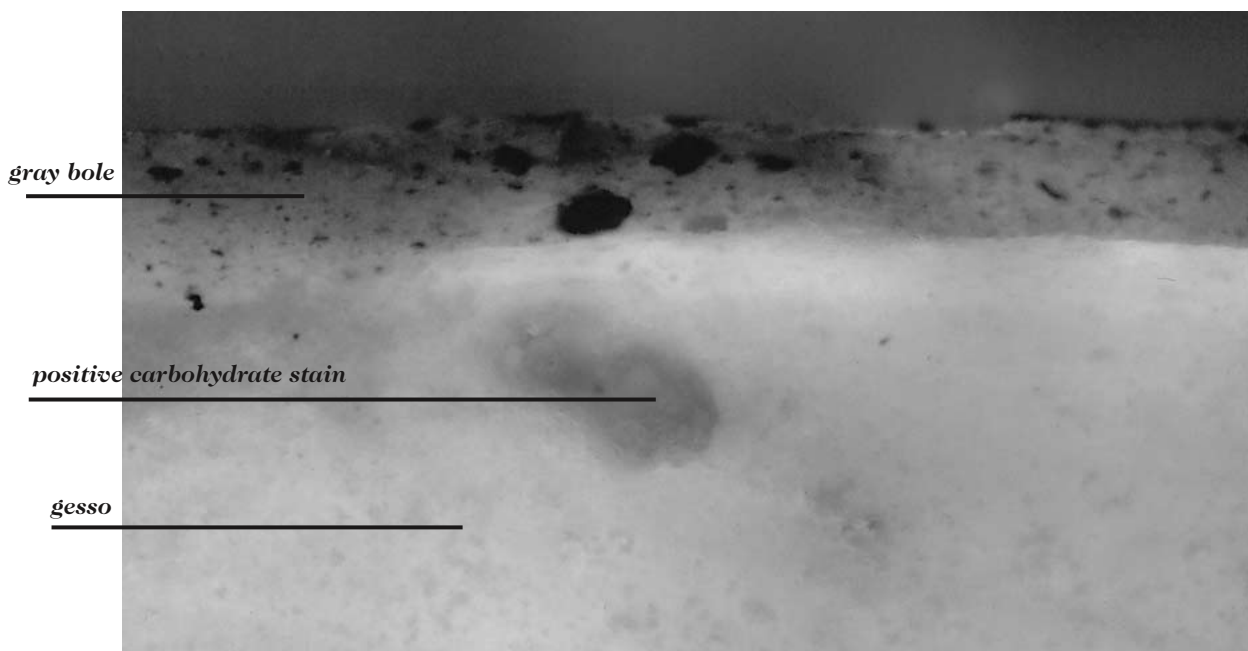
and then re-gilded at the time the frame was made, to give a consistent tone and finish to the final work. However, a distinctive dirt layer was visible between the gilding layers in this sample as well, and a test removal of the top gilding layer revealed an abraded and crazed gilding layer below. Both of these observations led to the conclusion that the top gilding layer was added significantly after the lower layer and thus represented a restoration. The similarity of the gray bole between original layers on the body of the frame and the restoration layers on the eagle was attributed to a restorer who had carefully matched the original bole color in his restoration.

During the treatment phase of this project, removal of the upper gilding layer on the eagle was begun. As the removal process began in an area of oil gilding, a definite similarity was noted between the yellow pigmented size used in the upper gilding layer on the eagle and the apparently original size on the rest of the frame. This raised further concerns that the upper gilding layers on the eagle might be contemporary with the original gilding on the rest of the frame. At this point removal was halted and a further sample was taken from the oil gilded body of the eagle. Microscopic examination of the upper yellow size layer confirmed its similarity to that found on the rest of the frame. While not precisely identical in appearance, similarities included particle size, color (bright yellow under UV), and distribution (the layer appeared stratified, as if poorly miscible components of the size had partially separated).

Up to this point, no fluorescent staining of samples for media analysis had been carried out. It was assumed that the oil and water gilding layers were of traditional composition and more detailed information did not seem necessary. Later, however, fluorescent stains were used to assist in the qualitative comparison of the upper gilding layers on the eagle with the original gilding on the rest of the frame. Four stains were used: triphenyl tetrazolium chloride (TTC) for carbohydrates, fluorocein isothiocyanate (FITC) for proteins, and dichlorofluorocein (DCF) and Rhodamine B (RhoB) for oils. When the oil gilding layers were stained and examined, the size used in the upper gilding layer on the eagle and the apparently original size on the rest of the frame both reacted



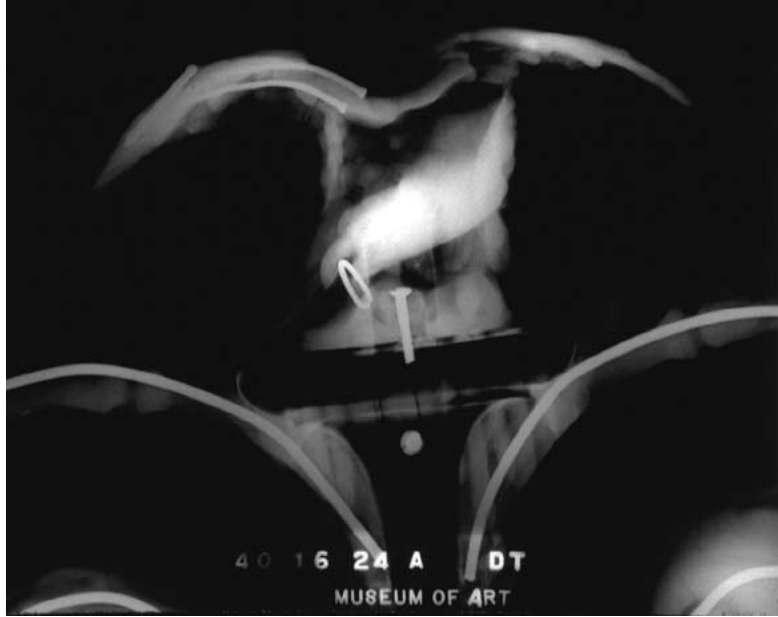
*Figure 2: Cross section of gilding layers from the eagle showing gray bole and unusual positive stain reaction for carbohydrates in gesso.*



*Figure 3: Cross section of gilding layers from the lower frame showing similar gray bole and carbohydrate reaction.*

negatively with TTC and FITC, and reacted positively, with a very similar intensity, with DCF and RhoB stains. While the general reaction results were not unexpected, the extremely similar reaction intensity indicated that the layers *could* be contemporaneous.

The sample of the upper water gilding layer on the eagle was re-examined and compared again to samples from original water gilding on the rest of the frame. As noted earlier, the gray bole had initially appeared similar across the samples when viewed through the microscope under visible and



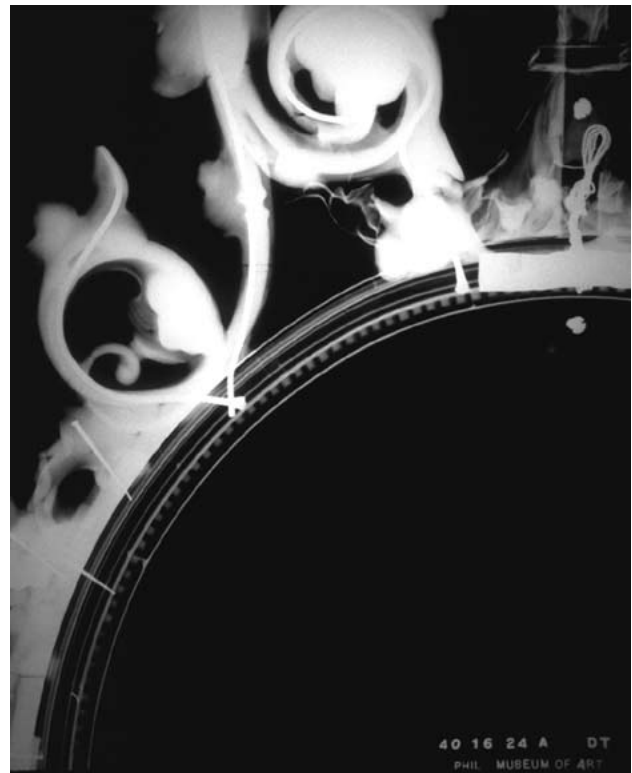
*Figure 4: X-radiograph of the eagle showing the nails used in prior wing repairs.*

UV light. The gesso layer beneath the bole also appeared similar but had few distinguishing characteristics. While the layer thicknesses varied considerably between all samples, the bole in all samples contained a small amount of a coarse black pigment particle of highly variable size (possibly a charcoal black) as well as a very few isolated red particles of uniform size and morphology. Because of the sparse and somewhat uneven distribution of colored pigment particles and disparate size of black particles encountered, some doubt remained that the two boles were the same. This uncertainty was greatly reduced when the samples were stained with TTC. The upper gesso layer on the eagle (applied directly over the underlying gilding) showed unusual, isolated round zones of strong positive reaction for carbohydrates. The original gesso layers in the water gilding from other areas of the frame reacted to TTC in a very similar manner; the shape, size, distribution, and intensity of the reaction zones was nearly identical. While the precise nature of the gesso additive presumably responsible for the positive reaction is not known, the staining certainly suggested that the gesso layers were contemporaneous (*figs. 2 and 3*).

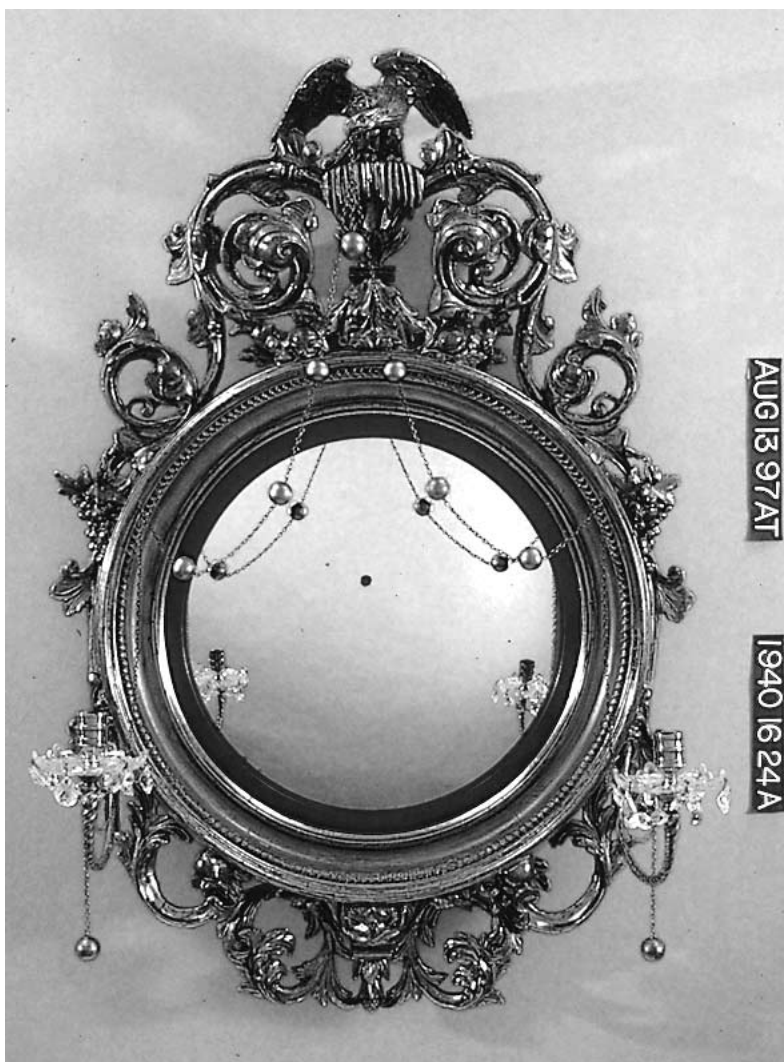
The entire back of the girandole frame is covered with a yellow ochre-colored paint which appears to be original. A close inspection with a stereomicroscope was made of the areas where the yellow

paint of the back met the gilding. On the body of the frame, the yellow paint overlapped the edges of the gilding on the front, indicating that the gilding had been executed first and the yellow paint applied subsequently. On the eagle, the yellow paint covered both the first *and* second gilding layers. This observation was confirmed by additional cross section sampling and lent further support to the idea that the re-gilding of the eagle occurred at the same time as the original gilding of the rest of the frame.

An X-radiograph was then made of the eagle and its perch (*fig. 4*). The film showed two repairs to the proper left wing. One of these repairs, located near the body of the eagle, utilized two cut nails as supporting elements which were embedded in composition putty. The yellow paint on the back of the frame appears to



*Figure 5: X-radiograph of the upper left quadrant of the frame showing very similar cut nails used as original armature (figures 4 and 5 are not to scale).*



**Figure 6: The girandole after treatment showing the final arrangement of balls and chain.**

be continuous over this repair. These nails appear to be the same size and shape as those seen in another X-radiograph of the body of the frame (*fig. 5*) where they were used as part of the original armature for composition ornament (in contrast, the second repair to the wing utilized a wire nail as a support and has been overpainted with what appears to be the same bronze paint used to restore the gilding on the front of the frame).

The most plausible explanation for all the evidence described above would seem to be that the eagle was taken from another, older artifact and reused in the construction of this frame. The evidence would suggest that the eagle (and presumably the rest of the artifact) was in poor condition, with dirty, crazed and abraded gilding (with a green-black ground) and

a broken wing. The eagle's wing was then repaired at the time the new girandole was being assembled, in a manner consistent with the overall construction of the frame (i.e., using a cut nail armature with compo). The new girandole, with the old eagle, was then gessoed and gilded with a yellow-pigmented oil size and a gray bole. Finally, yellow ochre paint was applied to the back of the frame, slightly overlapping the gilding on the front.

### The Balls and Chain

Girandoles of this period and general description were frequently ornamented with gilded balls strung on fine brass or iron chains. It seemed clear that this girandole was intended to have some arrangement of balls and chain hung from the frame. The eagle had a small iron ring in its mouth which was assumed to be a point of attachment for chain. Just behind the candle arms there were small composition florets mounted on twisted iron scrolls. These florets had fine iron wire loops on either side that were also apparently attachment points. Neither of the existing pair of frames retained any of its original balls and chain, so curatorial research and technical

examination were conducted to determine an appropriate arrangement. The Museum's library and the Decorative Arts Photograph Collection (DAPC) at Winterthur were consulted for images of similar girandoles with balls and chain. It appeared that the most likely configuration for this girandole would include: one or two balls suspended directly from the eagle's mouth; a single ball suspended from the outside of each of the composition florets behind the candle arms; and a string of several balls on each side, swagged from the eagle's mouth across to the upper left and right quadrants of the molded frame, and then down to the inside of the candle arm florets (*fig. 6*). There did not, however appear to be any visible evidence of attachment points on the upper quadrants of the inner frame where stylistic research suggested they should



*Figure 7: Detail of cove molding showing an area cleaned with triammonium citrate gel surrounded by areas cleaned with saliva.*

be. Considerable effort was given to finding an appropriate arrangement of balls and chain using only the five clear attachment points, but no satisfactory solution could be reached.

A series of eight X-radiographs was then made of the two matching frames to determine if any original attachment points might have been covered over by prior restoration. The upper left and right quadrants of each frame were imaged separately; one image made perpendicular to the frame from front to back, and another made laterally (radially) across the profile of the molded circular frame. In each film a small area of relatively high density fill was seen on the inside of the outer torus molding of the frame, in the “ten o’clock” and “two o’clock” positions. These areas (in fact, the entire torus molding on both frames) had been heavily restored in the past, with a layer of red paint, followed by bronze paint completely obscuring the original surface. While it was not entirely certain that the fills represented original attachment points, their consistent and symmetrical placement made it seem likely. When replacement balls and chain were temporarily arranged using these attachment points, the overall appearance correlated well with related examples.

## **Treatment**

### **Consolidation and Cleaning**

Areas of loose and flaking gilding were consolidated with isinglass glue, applied warm by brush or syringe. Dirt and surface soil were removed from oil gilded areas using a gelled solution of:

- 100 ml deionized water
- 2 ml triethanolamine
- 1 g citric acid
- ammonium hydroxide to pH 7.5
- 3.5 g Methocel A4M methylcellulose

The gel was brushed on and allowed to sit for between 30 seconds and one minute. It was then removed using cotton swabs and cleared well with deionized water. This chelating solution, based on triammonium citrate, was found to be significantly more effective than saliva at removing surface soil (*fig. 7*).

The bronze paint, used liberally to restore the girandole in the past, was found to be virtually insoluble in water or in any of a wide range of organic solvents including acetone and methylene chloride. Some method of safe removal was cer-

tainly desirable, as the paint was applied directly over original gilding. Solvent removal was, in any case, not an option on oil gilded areas because of the solvent sensitivity of the original oil size. Due to the extremely darkened and corroded state of the copper alloy pigment in the paint, it was thought that a strong aqueous chelating solution might be able to disrupt the bronze paint layer by attacking the corrosion at the pigment-binder interface. Several formulations were tested and two formulations were found to be quite effective. The first, used on most areas of bronze paint over oil gilding, contained:

- 100 ml deionized water
- 1 ml triethanolamine
- 2 g citric acid
- 1 g tetrasodium EDTA (ethylene diamine tetracetic acid)
- three drops Triton-X 100
- ammonium hydroxide to pH 5.5
- hydroxypropylcellulose, sufficient to make a very thick gel

In areas of particularly stubborn paint, a stronger formulation was used, containing double the amount of citric acid.

First, the bronze paint was mechanically reduced with a 0000 steel wool swab, working under magnification. The chelating gel, though effective, acted fairly slowly on the bronze paint, and this initial mechanical reduction allowed the removal to proceed more quickly. The gel was then brushed on and allowed to sit for between two and ten minutes, agitating periodically with a soft brush, until it became quite green from absorbed copper compounds. Using these solutions in gel form allowed them to sit for long periods of time on the surface without the risk of spreading onto water sensitive areas of water gilding. The bulk of the gel was then removed with the brush and the residue was cleared with deionized water. The process was



*Figure 8: Detail of the girandole before treatment showing darkened bronze paint.*



*Figure 9: Same area as figure 8, with chelating gel applied.*



*Figure 10: Same area as figure 8, after bronze paint removal.*

repeated one or more times as needed. Since it was thought that the oil size might be softened slightly by prolonged exposure to water, any given area of surface was allowed to dry for at least several hours before retreating. In fact, no new damage to the underlying gilding was observed during this treatment (*fig. 8, 9, and 10*). It is not known what the binder of the girandole's bronze paint was. Media analysis by staining and fluorescence microscopy was inconclusive since the layer was entirely non-fluorescent under ultraviolet light.

Areas of bronze paint lying over water gilding could not be removed with aqueous gel without damaging the gilding. As mentioned earlier, standard organic solvents, including proprietary methylene chloride-based paint strippers such as Strypeze™, were ineffective at removing the paint. Acetyl acetone is an organic solvent with some chelating properties. It is also extremely toxic and should be used only with the utmost care. A gel was prepared containing equal volumes of acetyl acetone and Strypeze™. After initially reducing the bronze paint with 0000 steel wool swabs, the gel was brushed on and allowed to sit for between two and ten minutes, agitating periodically with a soft brush. The bulk of the gel was then removed with the brush and the residue was cleared with acetone on cotton swabs. The process was repeated one or more times as needed. All work was carried out in a spray booth while wearing a respirator and neoprene gloves. This treatment effectively (if slowly) removed the bronze paint from the water gilded areas. In several areas, a water soluble red paint had been applied directly over the original water gilding prior to application of the bronze paint. In these areas, the bronze paint was simply abraded away with steel wool to reveal the paint below. No way could be found to remove this paint without disrupting the underlying gilding, and the decision was made to simply re-gild these areas without removing the red paint.

As discussed in detail above in "Examination and Analysis," removal of the upper layer of gilding on the eagle had begun before the determination was made that the upper layer of gilding was in fact original to the ca. 1830 assembly of the frame. A substantial portion of the water gilding had been removed from the fore-edge of the wings and from the eagle's head. A start had also been made on

reducing the upper layer of oil gilding on the eagle's body before work was halted and further examination was conducted. This was an unfortunate and, in hindsight, avoidable error. It can only be hoped that, as a cautionary tale, this paper may help other conservators avoid similar mistakes (see "Conclusions").

### Loss Compensation

Small areas of loss were filled with traditional gesso, modified by the addition of barium sulfate to increase X-radiographic density and distinguish these fills from the original material. Several larger areas of loss were replaced by making molds from existing elements on the matching frame with Accoec® silicon tray material, a quick-setting dental molding compound. Araldite® 1253 paste epoxy was cast into the molds to produce replacement parts. Elements replicated in this fashion included: three of the four florets behind the candle arms; the twisted composition ornament covering the lower portion of the proper left candle arm; two leaf tips behind the proper left candle arm; and the central acanthus leaf ornament below the eagle's perch. The curled end of this leaf ornament was also missing from the matching frame, so this portion was cast from a mold of the *lower* acanthus leaf ornament and subsequently attached to the partial casting of the upper ornament. These Araldite™ fills (with the exception of the florets) were given a thin coat of gesso and smoothed in preparation for re-gilding.

A set of seven balls of approximately 7/8" diameter were turned from yellow poplar to replace the missing gilded balls. This size was thought to be in sympathy with the arc of the cove molding as well as with several of the quasi-spherical composition ornaments. Two small, gilded wooden turnings were missing from the candle arms, just below the glass bobêches. These were also replicated in poplar, based on a partial original turning on the matching frame. The balls and turnings were given a thin coat of gesso and smoothed in preparation for gilding.

After an unsuccessful search for appropriate, commercially available replacement chain, approximately six feet of chain was fabricated from 3/64" solid brass rod. The rod was annealed, twisted onto a figure-eight jig, clipped into links,

and assembled. The conformation and weight of the chain was based on period chain from objects in the museum's collection, photographs of related girandoles, and the opinion of the curator. The chain was then patinated with proprietary solutions, partially re-polished, and waxed to provide a pleasing and sympathetic appearance. With an effective jig and simple tools, the chain was completed in about a day, less time than one might think for such a tedious operation.

### **Ingilding and Inpainting**

Araldite™ and gesso fills in areas of oil gilding were sealed with shellac mixed with yellow ochre pigment and then oil gilded in the traditional manner. The wood replacement balls and candle arm turnings were gilded in the same manner. This method was intentionally different from that used originally (and should be distinguishable to future conservators), but yielded a similar appearance. These areas were then toned to match with powdered pigments and dyes in Soluvar™ gloss picture varnish.

Areas of water gilding which could not be safely cleaned of the restoration red paint, as well as the eagle's head and forewings (where the original gilding had been mistakenly removed) were prepared for re-gilding with Kohlner system "Glanzgold" bole. A mixture of prepared colors was used to imitate the gray color of the original bole. This preparation is soluble in polar solvents such as ethanol and acetone, allowing it to be removed safely in the future from the underlying water gilding. The Kohlner bole was kept as thin as was practical, to minimize alteration of the underlying forms. The Kohlner bole was then gilded with double weight gold leaf, burnished, abraded, and toned to match the surrounding original water gilding.

Areas of badly abraded original oil gilding were inpainted using a combination of earth pigments and mica pigments in Soluvar™ gloss picture varnish.

### **Other Treatment**

The replacement balls and chain were attached to the frame in an arrangement agreed upon with the curator (*fig. 6*). To attach the chain to the torus molding in the "ten o'clock" and "two o'clock" positions, very fine stainless steel "insect pins"

were bent and clipped into a figure "P", with the opening just large enough for a link of chain to be inserted. Two very fine holes were then drilled into the frame 1/2" above the locations indicated by the X-radiographs. The site was shifted slightly to avoid disturbing the site of possible original attachment in case further investigation should be carried out at a later date. The insect pins were then glued into the holes with B-72 acrylic adhesive and the new chain was attached.

The brass candle holders were soaked in deionized water for approximately one hour to soften metal polish residues. They were then steam cleaned and polished with Silvo™ metal polish. After cleaning and degreasing in acetone, they were coated with microcrystalline wax. The cut crystal *bobêches* were cleaned with deionized water and cotton, and all elements of the candle arms were then reassembled.

Finally, the mirror and black liner were reinserted into the frame and secured.

### **Conclusions**

The removal of bronze paint from oil gilding is often desirable, but frequently difficult to accomplish. In this case, the complete removal of bronze paint was possible using chelating agents. The effectiveness of this treatment seems to be directly related to the highly corroded state of the metal powder particles in the paint. While chelating agents such as triammonium citrate and EDTA could be effective on uncorroded metal particles in a well preserved paint, they are much *more* effective and will act more quickly on corrosion products, such as were found in the girandole's degraded bronze paint. In this case, the chelating agents presumably broke down the cohesion of the paint layer by dissolving the corroded surface of the metal particles and thus undermining the adhesion between the binder and the particles. This action was fairly slow, even on corroded paint. On an uncorroded bronze paint, the action of chelating gels such as those used here could be prohibitively slow. It is worthwhile to note though, that preliminary removal of the bulk of the paint by mechanical means minimizes the amount of paint to be removed by chelating agents.

This treatment provided a good example of the use of cross section microscopy and fluorochrome staining for comparative layer analysis. From

initial microscopic inspection, it was not readily apparent that the re-gilding on the eagle was contemporaneous with the original gilding on the body of the frame. The use of ultraviolet microscopy with fluorochrome stains was very helpful in establishing this connection.

Finally, a personal note: I (the author) learned a hard lesson from this treatment. Preliminary cross section microscopy had shown that the original gilding on the eagle was markedly different from that on the rest of the frame. It had also shown that the upper “restoration” layer of gilding on the eagle was superficially similar to the original gilding on the rest of the frame. In retrospect, it seems obvious that removal of the “restoration” gilding on the eagle should have been delayed until thorough comparative analysis had made sense of this seemingly anomalous situation. In fact, however, I proceeded with the removal of the upper gilding layers on the eagle, and was nearly half done before alarm bells went off and a more thorough investigation revealed the truth of the situation. Looking back on the situation, I have tried to understand how I made the decisions I did, and where I could have made key decisions differently.

First of all, it is clear that I proceeded before I really had a sound understanding of the gilding history on the girandole. That is not to say that I hadn't thought about it a great deal. As I mentioned above, I had considered the possibility that the re-gilding of the eagle was contemporaneous with the rest of the frame; but, at the time, the only scenario I could imagine to explain such a situation was that the eagle had been fabricated and gilded by a specialist and then sold to the frame maker who attached it to his girandole and then gilded the whole. Aside from seeming unlikely in the first place (why would a carver gild an ornament knowing that it would have to be re-gilded to match after installation?), this hypothesis was rejected because the original gilding was clearly dirty and degraded at the time it was re-gilded. In hindsight, I was very close to understanding the real explanation and to seeing that the eagle was already old when the frame was made. The fact remains that I did not take that next step, and instead I looked for possible scenarios to explain why the original gilding on the

eagle was different from other areas of the frame. I thought perhaps that the eagle was *intended* to contrast in tone with the rest of the frame; or that the eagle *was* made and gilded by a specialist, but *not* re-gilded by the framemaker. Neither of these (nor any of several other) explanations seemed convincing to me at the time. Nevertheless, I made the decision to proceed with removal of the upper gilding on the eagle, knowing that I didn't have a complete understanding of the history. Why?

I think there were two primary factors that contributed to my decision. First, I boiled down my reasoning (wrongly) to this: the lower gilding was old when it was re-gilded, therefore, whatever the specific circumstances were, the upper gilding must be a later restoration and therefore should be removed. Second, the mate to this frame (remember, it is one of a pair) had been treated in the past, and the “restoration” gilding on its eagle had been removed from it at that time. Of course, past treatment shouldn't necessarily be a guide to present treatment, but at the time, it made me feel more secure in my decision.

So what was the lesson learned? Even though I understood the situation well enough to proceed safely, I have come away from this experience with the determination to pay more attention to any nagging doubts. I can only hope that sharing this cautionary tale may help us all avert similar mistakes in the future.

### **Acknowledgments**

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### **Materials**

Accoe™ Silicon Tray Material  
GC America Inc.  
Chicago, IL

Araldite1253  
carvable paste epoxy  
Ciba-Geigy

B-72  
a copolymer of ethyl methacrylate and  
methyl acrylate  
Rohm and Haas  
Philadelphia, PA

Chemical reagents, including;  
ammonium hydroxide  
citric acid  
dichlorofluorocein  
fluorocein isothiocyanate  
Rhodamine B  
tetrasodium EDTA  
triethanolamine  
triphenyl tetrazolium chloride  
Available from Sigma Chemical, St Louis, MO

Kohlner System Bole  
Kohlner-LandzGold-Grund  
Germany

Merlin Luster Pigments  
interference pigments containing mica, iron  
oxide, and titanium dioxide  
The Mearl Corporation  
New York, NY

Methocel, A4M  
(and other cellulose ethers)  
premium grade methylcellulose  
Dow Chemical Company  
Midland, MI

Silvo™ Polish  
Duraglit - Reckitt Coleman SA  
Bilbao, Spain

Solovar™ Gloss Picture Varnish  
a proprietary mixture of poly(isobutyl meth-  
acrylate)  
and poly(n-butyl methacrylate)  
Binney and Smith  
Easton, PA

Triton-X 100  
a non-ionic detergent, water soluble reaction

product of octylphenol with ethylene oxide.  
Available from conservation suppliers.

Strypeze™  
a proprietary methylene chloride based  
paint stripper  
Savogran Co.  
Norwood, MA