Conservation of the Darnault Mirror: An Acrylic Emulsion Compensation System

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Abstract: This paper will discuss the evolution of the treatment for a 1751 French *boiserie* mirror retaining approximately 30% of its original gilding. In the first phase of the treatment, the mirror had been thoroughly analyzed and documented, tests were undertaken and cleaning and compensation method testing had commenced. This philosophical discussion was presented in a paper in the general session last year. Ultimately, the conservators were not pleased with the results. A reevaluation resulting in redesigning of a barrier coat and compensation to the gilding losses were decided upon using different materials than were previously tested. In devising this alternative system, one of the many interesting challenges before us was that the original goals of the project remained constant. Of primary concern to the curators was the interpretation and display of the mirror within the gallery setting in relation to the other gilded objects around it. The conservators' chief concern was a desire to preserve the physical integrity of the object itself without permanently transforming it should reinterpretation come up in the future. Aware of the strong craft tradition influencing the treatment of European eighteenth century gilded wood objects, we were faced with the choice of introducing nontraditional materials onto this surface. In getting them to compliment the remaining original gilding, we were challenged by the application of the materials. Our curatorial staff required a restored surface, therefore this application needed to satisfy that aesthetic.

This paper will give a brief overview of the work done previously and the revised treatment to the Darnault mirror including manipulation of the acrylic emulsion medium, the mica pigments and gold leaf. This technique was inspired by Jonathan Thornton's work at Buffalo State College and we found it served our purposes very well. Perhaps this system could be useful applied to other gilded objects which have the same requirements.

Introduction

This paper is the result of an evolving treatment initiated by Nancie Ravenel and Gordon Hanlon at the J. Paul Getty Museum in 1992. The first part focussed on the technical and aesthetic considerations taken into account in determining a course of treatment, particularly a cleaning and a loss compensation system, for a badly degraded, water gilded, 1751 French Rococo period mirror frame in the collection of the J. Paul Getty Museum (*U.86.4)*, which originally had been part of a *boiserie* or panelled room.[1] This paper draws on that initial materials analysis, testing and sampling and elaborates on a reevaluation of those results. That initial work provided a foundation for further cleaning tests and ultimately, a decision as to how to ingild and compensate the surface losses. This paper brings to light those conclusions.

As we set out on this phase of the treatment, we grappled with the two initial main goals. The first goal, which is applicable to all conservation treatments, was to preserve the material integrity of the object, especially in this case, what was left of the twenty to forty per cent of the delicately recut gesso and the water gilding

layer. By opening the search to materials not considered in the first phase, we were able to devise an alternative cleaning system and surface loss compensation system which achieved the appropriate aesthetic, accomplished with what we've come to describe as an acrylic emulsion inpainting mordant system. The second goal was to satisfy the curatorial requirement that the mirror be integrated into the display within a gallery setting with other gilded objects which were in far more preserved and restored condition. An important requirement of the appearance of the mirror frame was to have it harmonize with the other giltwood objects to be displayed in the new Rococo gallery installation at the new Getty Center in West Los Angeles, scheduled to open to the public in 1997. This includes the Contant d'Ivry designed, giltwood, Rococo period console table, circa 1750, which is to be displayed below the Darnault mirror panel ensemble, and the Rococo period Tillard bed, circa 1750, which is water gilded in both lemon and deep colored leaf. Both the console table and bed have dissimilar, but nevertheless restored, surfaces. Though the console table was restored in England, the bed was treated in Paris. There remains a strong emphasis within the European gilding community to restore degraded gilded surfaces with traditional materials. Giltwood pieces of French origin in the Getty collection have been treated in Parisian *ateliers* for restoration or regilding in the past. The craft tradition there remains strong with many talented gilders in residence and training and apprenticeships in traditional gilding techniques still available, as they have been for centuries.

In this paper, we'd like to first describe some of the provenance history concerning the mirror frame's attribution and provide a physical description of the mirror. The next section is a review of the first phase of the treatment, followed by an overview of the specifics of the second phase, which includes describing the condition of the mirror between the two phases and the continued cleaning and compensation with the materials we tested and ultimately used. The paper ends with conclusions describing the attributes and potential drawbacks, as we see them, of this system.

Art Historical and Physical Descriptions

The mirror, as purchased, is comprised of three panel elements of a Rococo period boiserie, two of which bear paper labels of the *marchand-mercier* Francois Charles Darnault, whose shop was on the Rue Grenier St. Lazare in Paris in 1751. From the information on his label we know that he dealt in a variety of "fancy goods"; carved, giltwood and ormolu objects including mirrors of all varieties, decorative items such as lustres and wall lights, and all types of furniture, such as console tables with marble tops, secretaries, gaming tables, writing desks, and screens, some with chinoiserie type decorated surfaces, others with chased, gilded hardware, and even overdoor paintings, much like his father who operated a separate shop on the Rue de la Monnoie. Research continues to be carried out at the Archives Nationales in Paris on the Darnault family and their dealings.[2] Perhaps one day, we will know in what building these boiserie elements would have been installed, but at this time we do not.

The boiserie mirror we treated, which is long and narrow (eleven feet tall and only four feet, six and a half inches wide) is thought to have been originally designed for placement over a *soubasement* panel (rather than a mantel) within the context of an entire panelled room.[3] The Darnault mirror's two narrow, flanking *parclose* panels have not yet been treated at the time of this writing. The central panel, which is the focus of this paper, is composed of thirteen separate, water gilded moldings, carved in basswood (or limewood), fastened with brass screws and applied to a white painted, oak, panel and frame constructed back board. One of the paper labels is located in a central floating panel on the backboard facing into the room under the glass plate. The flanking parcloses are also water gilded, carved limewood moldings on a white, painted oak panel. The other paper label is on the reverse of one of these narrow panels. The central panel's uppermost frame would have originally surrounded a canvas painting, no longer part of the ensemble. The lower frame surrounds the mirror plates. The carving above is characterized by a broad, burnished, scrolled band with a central shell at the crest and styl-

ized *rocaille* at the corners and sides. Flowers, in the forms of marguerites and roses, punctuate the perimeter. Palmette carved moldings support this frame and the center shell from below, and floral garlands spiral down the sides to rest on symmetrical volutes, which flank a delicate, Régence style molding at the base, entwined in ribbon and ornamented with gadrooning and an inverted central shell. The thirteen, carved limewood elements which comprise this double frame were originally, traditionally water gilded with an ochre size on the matte areas and a red brown bole on the burnished areas.[4] The palmettes which are used on the sides and lower crest moldings are composed of entirely different design motifs than the base molding. The top frame with its scrolling bands is different yet again. These three disparate carving themes represent a stylistic transition from the Régence period in 1725 through the Rococo. Different volumes of matte and burnished surface areas and dark and light areas between them draw the eye to the area of the frame above, no doubt to emphasize the painting which had originally been displayed in this upper frame, but is no longer part of the ensemble.

First Treatment Phase

Samples were taken from areas of carved wood, gilding and paint. Sample tangential and radial wood fragments were analyzed microscopically resulting in the identification of the species *Tilia* spp., or basswood. Fluorescent microscopy was used to determine the nature of the gesso, grounds, gilding and paint. It helped to determine the nature of both residual overpaint on the giltwood moldings from the backboard's repeated overpainting while the moldings remained in place, as well as the stratigraphy of the color campaigns on the oak backboard itself, numbering ten in all. The analysis of the nature of the degraded gesso, of the gilding and the coatings with fluorescent microscopy included staining the samples with fluorochrome dyes, consulting with Richard Wolbers during his stay as a guest conservator in 1992.[5]

The initial condition of the moldings and the gilding on both the main panel and the two parcloses was thoroughly documented with photography and diagrammatic descriptions in the form of Mylar overlays and hand colored Xeroxes. These pointed out areas of repair and loss to the wood carvings as well as the patterns of the burnished and matte passages on the gilded surfaces.

To determine the selection of a barrier coat, a test sample was fabricated to simulate aged gesso. The degree to which various percentage viscosities of a dyed synthetic resin, in this case Arkon P-90, would penetrate the surface of this simulated aged gesso layer coated with rabbit skin glue were tested.[6] Sample moldings from the object were then treated for comparison in the following manner:

After initial cleaning, the middle central shell, M, was coated with Arkon in areas of severe gesso loss beneath the fills only. A traditional gesso and water gilding system was used to compensate the burnished areas. Gouache inpainting was used for the matte water gilded passages. Two other carved sections from the upper frame, T (the top section) and CR (the center right section), which had greater degrees of loss to the gilded surface, were treated differently. After cleaning, they were first coated with the rabbit skin glue consolidant, then a 45% Arkon P-90 barrier coat. Finally, after filling, they were completely coated with yellow ochre bole, selectively coated with deep red bole, overgilded and selectively burnished. These two ranges of compensation carried out on elements M, T and CR were examined carefully, but their appearance as compared to the original gilding proved to be unsatisfactory.

The conservators felt that the initial approach to the final aesthetic of the Darnault mirror, as attempted by the compensation on the middle central shell, M, would have resulted in too many non-reflective, matte areas due to the great number of surface losses compensated in gouache. On the other hand, when scrutinizing the surface compensation samples of molding elements T and CR, which were completely overgilded, the conservators found that the barrier coat of Arkon P-90 with its underlying double layer of rabbit skin glue consolidant proved to be too inflexible to yield the appearance of a burnished gilt surface adjacent to a matte surface. In addition, the multiple coating layers on top of the original surface

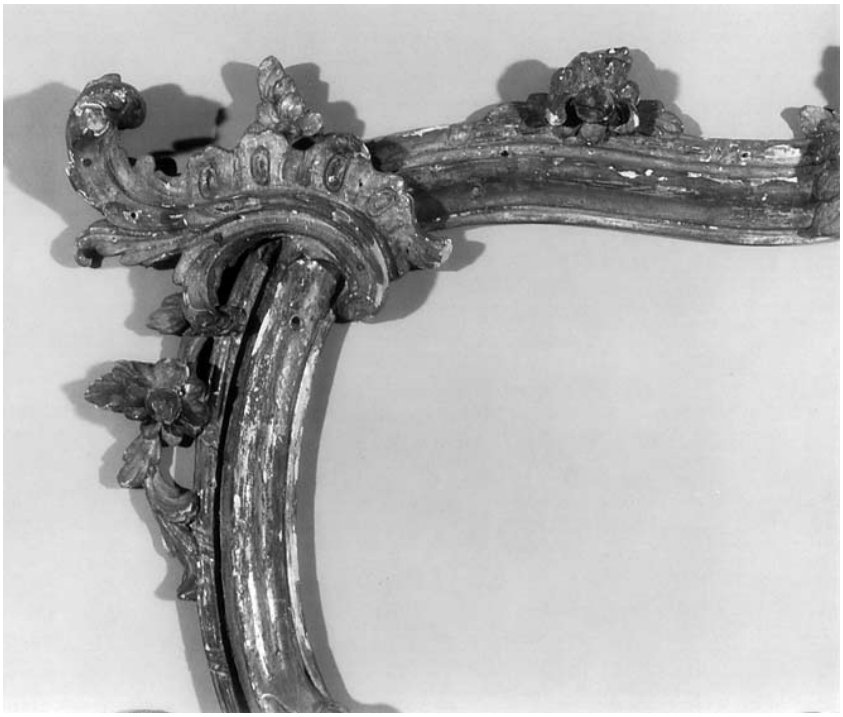

Figure 1. Pretreatment photograph. Detail at the upper left of the frame where segments T and LT intersect. Darnault mirror. U.86.4. J. Paul Getty Museum.

clogged the recutting in the gesso, obliterating its delicate sculptural quality. This confirmed one of the original fears about this type of compensation, which includes many additional layers. In comparing the two systems, the conservators sought a compromise between the two sample compensation methods but had not yet come up with a solution in the fall of 1993.

Second Phase of Treatment

When the treatment project resumed in January, 1994, we were dealing with a partially cleaned, partially filled (in terms of gesso losses) series of carved molding sections. Much of the degraded glue size, which had initially presented such cleaning difficulties, remained on the surface and discolored the gilding. This dark toner was resistant to the gel systems recommended by Richard Wolbers.[7] A fair amount of thick glue size was still on the surface of the moldings, proving to be too intractable. With further testing we found this glue size coating was not remotely susceptible to acetone gel but overly reactive to ethanol gel, which also softened the water gilding. Upon closer examination of the surfaces, it was felt that trying to continue the cleaning would reveal more original gilding. It would also dictate a compensation approach that would satisfy the compromise we sought between the two test samples of gilding restoration campaigns on the central shell, M, and the two top moldings, T and CR. More bright original gilding would be revealed and ingilding, rather than overgilding would be warranted.

Before continued cleaning, we recorded the status of the thirteen carved elements as to whether they'd been: a) simply cleaned with methylene chloride paint remover, which had been used to remove overpaint, b) the above and, consolidated with rabbit skin glue, c) both the above and, had a barrier coat of Arkon P-90 applied, d) all the above and, been overgilded with a traditional water gilding system including ochre and red bole or e) none of the above.

While the uppermost frame which includes molding elements T (top), LT (left top), RT (right top), ML (mid left), MR (mid right), CL (center left), CR (center right), SR (side right), and M (middle central shell) retained almost 40% of their original gilding , they had been coated with rabbit skin glue and Arkon P-90. On the other hand, we found that elements L (left), R (right), B (base) and SL (side left), which comprise mostly the lower frame, had only been partially cleaned, and not coated with either rabbit skin glue or Arkon P-90. These responded very well to a cleaning with a Triton X-100: Xylene: Water emulsion system cleared with xylene. Though their gesso surfaces and gilding were the most severely degraded, (L and R retaining only approximately 20% of their original water gilding, B and SL retaining 30%), the remaining surface, with its gilding and thin glue size coating intact, provided a standard to which we attempted to clean and compensate the other nine elements. We were able to easily reverse the overgilding on elements T and CL with warm water soaked cotton swabs. The Arkon P-90 could easily be reversed with naphtha. What provided the greatest

challenge was reversal of the two coats of rabbit skin glue consolidant and barrier coat which did not penetrate the degraded gesso on some of the molding elements, particularly SL and SR, but sat on the surface, obliterating the delicate channels of recutting and forming a stubborn bond with the underlying original water gilding. Because, in several instances, the glue consolidant had cooled and gelled when it came into contact with the surface, it did not penetrate into the friable, powdery gesso as was the intention in the original treatment goal. Instead, it lay on the surface, locking in the degraded glue size coating and its incumbent grime, giving the degraded gilding a grey cast. We could remove this glue only by soaking it to its gelled state and peeling it off mechanically. Though carried out on three moldings, ultimately this proved too time consuming so we elected to bring the cleaning part of the treatment to a close and work on compensation methods for the existing gilding remaining.

Based on the extent of the pretreatment, by January 1994, we had to develop a system which would be expedient. It would need to satisfy the minimum requirements of a simple gouache inpainting method to unify the surface as a whole, but be able to serve as a mordant should the application of leaf be required. It would need to be reversible and distinguishable from the original gilding and be able to adhere to the barrier coat. We felt an inpainting mordant, a colored size, would be ideal and initially discussed a pigmented or dyed oil-type size. The issue of a matte appearance to the surface was of particular importance and was a major consideration in our decision making process. We found that the Arkon P-90 barrier coat had been too glossy in appearance for the matte water gilded passages. Initially, Jonathan Thornton's article on alternative gilding methods was helpful.[7] We then considered an acrylic emulsion medium as a possibility and tested a number of products. We narrowed our testing down to the Instacoll system, the Rhoplexes and the Liquitexes. The Liquitexes had the most desirable properties, particularly because they offered a pre-mixed matte medium. It was this product, applied to a barrier coat of Soluvar matte medium diluted 1:1 with petroleum benzine, which gave us the non-glossy surface which all the other synthetic resins did not.

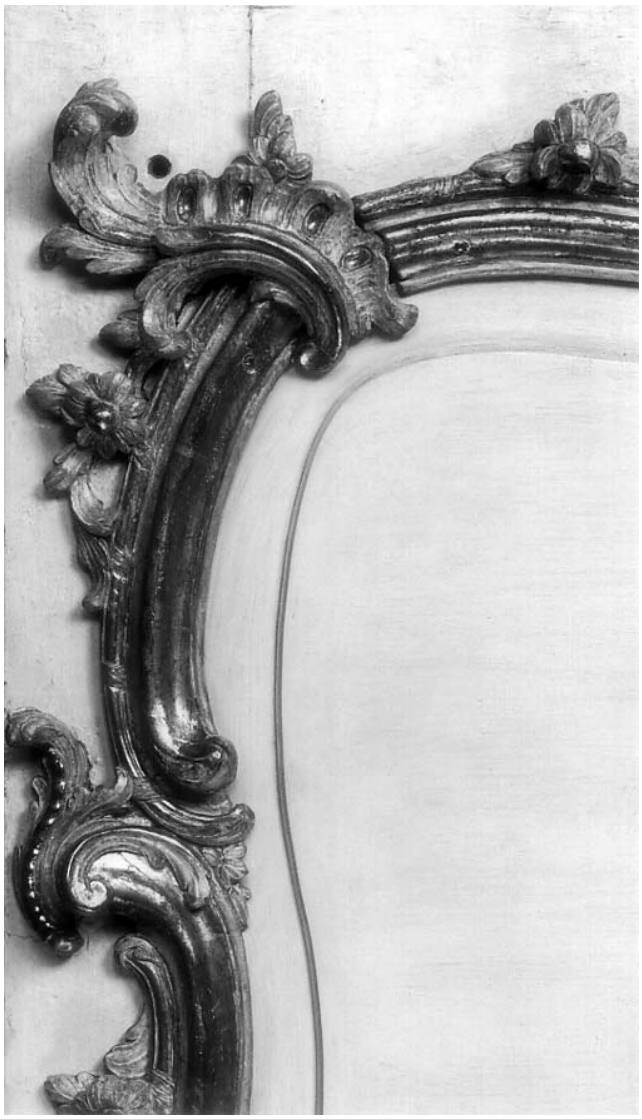

Figure 2. After treatment photograph. Detail at the upper left of the frame where segments T and LT intersect. Darnault mirror. U.86.4. J. Paul Getty Museum.

The acrylic resins are available through several manufacturers in a range of properties which included those which dry quickly and hard, to those which dry more slowly and with a softer film. They can be mixed together and adapted to achieve the desired effect and degree of tackiness. By re-wetting the emulsion, it becomes tacky for a short period of time, and leaf or powders can then be applied to selected, re-wetted areas.

We conducted a number of tests with acrylic emulsion mediums and paints and finally settled on using Liquitex matte medium mixed with appropriate hues of ochre watercolor paint added

to simulate the losses in the matte water gilded areas. This inpainting mordant could be made suitably transparent or opaque and served to join the islands of original gilding still exposed on the moldings. In turn, areas of loss to the burnished areas were inpainted with Liquitex gloss medium tinted to a reddish brown with water color pigment.

The inpainting alone served to integrate the surface as a whole, yet it remained non-reflective. After allowing it to dry overnight, any impasto brush strokes in the dark red areas were flattened by "burnishing"—gently rubbing the areas with an agate burnisher, ever so slightly oiled. These areas had French manufactured, "Versailles" colored gold leaf applied to them, adhered by re-wetting them with water and cutting and laying the leaf to fit just over the burnish losses, much like traditional water gilding techniques. The edges were then feathered with an oil free steel wool swab and afterward, the adhered leaf was burnished to impart a smooth surface. The proud edges and tips were distressed mechanically with a scalpel or a steel wool swab.

The matte areas were treated differently. Gold leaf was felt to be too reflective for these matte passages, so instead, gold colored mica pigments were applied by selectively re-wetting the acrylic inpainting and stippling mixtures of dry mica powders to areas of loss. Paler powders were used for areas of transition on the deep, red brown emulsion inpainting mordant. Deeper colored mica powders were used for ochre areas which simulated the toned, matte water gilding. Too uniform an application of the powders had to be avoided and due to the powders' transparency, the ground color had to be carefully matched. No toner was applied over the gold or the powders, except in the case of the upper frame, whose broad band of burnished molding had a layer of Liquitex gloss medium, tinted with water color, applied to areas of gold leaf ingilding. With this system, the surface was unified for display.

Carving losses were replaced with traditional limewood, adhered with hot hide glue, coated with traditional gesso, recut and ingilded with the acrylic emulsion system. Gesso losses were filled traditionally over the barrier coat of Soluvar

Figure 3. Pretreatment photograph. Detail showing the central shell in segment T. Darnault mirror. U.86.4. J. Paul Getty Museum.

matte medium and with particular focus paid to losses on the lower portion of the frame. We found toning fresh gesso with water color prior to ingilding provided a ground color better resembling the period gesso surface color.

The backboard surface was analyzed in cross section, which revealed it had been painted white originally. We decided to simply clean the existing white paint coating, though it was not the original layer.[9] Quite thick, any fractured, unstable paint was consolidated with rabbit skin glue and then a gelatine barrier coat was applied to areas of loss. Polyfilla, pigmented with acrylic paint to match the underlying blue and green layers was used to bring the surface flush with the top paint film. The fills were smoothed and Liquitex matte acrylic medium was mixed with white acrylic paint to simulate both the transparency and impasto of the white surface coating. When dry, the white was toned with a water color wash and sealed with Liquitex gloss acrylic medium to visually tie it into adjacent areas, and to protect it when handled.

The upper panel insert, a twentieth century addition, was isolated with gelatine, inpainted with an acrylic ground and a final water color wash was added to simulate the white backboard.

Finally reassembled, the central portion of the Darnault mirror is currently installed in Gallery 213.

Conclusions

We feel that this system fulfills many of the requirements we initially sought. It is distinguishable from the original water gilding chemically but physically, only upon very close inspection. It is entirely reversible should reinterpretation of the object be necessary in the future. It is a compensation method to which one can add varying degrees of gold leaf and/or mica or gold powders, depending on the requirements. A perfectly smooth gesso surface is not imperative for this system, which reduces preparation time and the introduction of additional gesso on original gesso surfaces. This system does not require a toner over the leaf or pigments. After the barrier coat application, only one layer in two colors is applied prior to the application of leaf or powders, establishing a very thin surface layer addition. As a result, recutting details are not lost.

Some of the difficulties and criticisms of the acrylic emulsion inpainting mordant that arose in practice and may present themselves in the future are these: Color matching was a challenge because the acrylics dry darker than they do when mixed wet. They tend to be rubbery to work with, not flowing enough to provide the impeccably smooth surface sought in gilding grounds. Some of the mica pigments are more metallic, more "glittery" looking and only the very finely ground powders are suitable in this application. Though a desirable quality in

Figure 4. After treatment. Detail showing the central shell in segment T. Darnault mirror. U.86.4. J. Paul Getty Museum.

terms of reversibility, the Liquitex forms a poor bond with the Soluvar matte medium. In application, it may bead on the surface of this barrier coat when thinned with too much water. The question of the cross linking potential of an acrylic in the future and its continued reversibility in the long run should be kept in mind.[10] Presently, the system can almost be peeled off the Soluvar but otherwise, the acrylics are soluble in xylene or toluene, and the Soluvar in naphtha or petroleum benzine. We question also whether the Xylene:Triton X-100:Water emulsion is fully cleared from the porous gesso and to what degree the Soluvar matte is intractable from these areas. However, in spite of these concerns, the system fulfills both our material and aesthetic requirements for displaying the mirror frame, both in context in the Gallery and in its own right, on its own. Like any conservation treatment it is a choice, based on many factors. We feel we have, however, indeed, struck a balance.

Acknowledgments

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Endnotes

1. Ms. Ravenal published the results of the first part of the treatment in the publication entitled "Loss Compensation: Technical and Philosophical Issues", the Objects Specialty Subgroup Postprints from the 1994 AIC meeting in Nashville, calling it "Conservation of the Darnault Mirror; Striking a Balance".

2. Further research on the Darnault family is forthcoming in the soon to be published book on the eighteenth century Parisian

Figure 5. After treatment. Darnault mirror. U.86.4. J. Paul Getty Museum

marchands-merciers by the scholar Caroline Sargentson, to be co-published by the Getty Museum.

3. For illustration, please see Figure 174 from Fiske Kimball's *The Creation of the Rococo Decorative Style,* 1980. London: Dover, showing an elevation from the "chambre de la Reine" at Versailles dating 1730, with a mirror above "soubasement" panelling with a console table in front, much the way the Getty Darnault mirror would have been displayed. Another illustration, Figure 232, also from Kimball, shows another elevation from Versailles from the "chambre de Louis XV". In addition, two illustrations from volume I of Jacques-Francois Blondel's 1737 book *De la Distribution des Maisons de Plaisance, et de la Decoration des Edifices en General,* 1967. England: Gregg Press, show in Plate 67 on p. 73 a design for a mirror with a painting above, which is flanked by two narrow parcloses and in Plate 64 on p. 72, an illustration for a mirror with a similar palm frond motif as the Getty Darnault mirror.

4. The palm frond mirror currently in the *salon ovale du prince de Soubise* from the Hotel Soubise in Paris, which is now used by the Archives Nationales, has recently been restored and looks as the Darnault must have originally looked.

5. Test results showed the gesso to be an emulsion, containing both protein and traces of oil. The overpaint on the carved moldings was found to be protein based. Recommendations for cleaning included trying an acetone gel and a xylene gel. R. Wolbers notes, 8/21/92.

6. The mock up was made of a gesso made with overcooked glue soaked in water and heated in a microwave oven. Arkon P-90 in 15%, 45% and 90% strengths colored with yellow pigment was applied to determine depth of penetration of the coating. The rabbit skin glue added prior to the Arkon prevented this low molecular weight resin from penetrating too much.

7. Equal parts of mineral spirits and water are shaken together with a few drops of Triton X-100 and the top half is decanted and used to clean the water gilding. It is mostly mineral spirits with very little water. R. Wolbers notes. 4/94.

8. Thornton, J., "The Use of Nontraditional Gilding Methods and Materials in Conservation". In *Gilded Wood: Conservation and History,* ed. D. Bigelow, et al. Madison, CT: Sound View Press. 217-228.

9. Between the topmost white layer and the original were more than eight layers of paint campaigns including light blues and greens, some bound in oil and/or protein with one water soluble.

10. Horie, C.V.,1987. *Materials for Conservation: Organic Consolidants, Adhesives and Coatings.* London: Butterworth's, p.103-112.

Suppliers

Liquitex Acrylic mediums
Binney and Smith, Inc.
Easton, PA 18044-0431

Soluvar Matte Acrylic resin
Binney and Smith, Inc.
Easton, PA 18044-0431

Instacoll
Kolner-GlanzGold-Grund
West Germany
Available from Sepp Leaf Products
381 Park Avenue South
New York, NY 10016 (212) 683 2840

Rhoplex AC-33, Rhoplex N-580
Rohm and Haas Co., Philadelphia, PA
Distributed by Conservation Materials, Ltd.
240 Freeport Blvd., P.O. Box 2884
Sparks, NV 89432

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