2000
AIC PAINTINGS SPECIALTY GROUP POSTPRINTS

Philadelphia,Pennsylvania **June8 - 13, 2000**

The American Instiute for Conservation of Historic and Artisti Works

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Papers Presented at the Twenty-Eighth Annual Meeting
of The American Institute for Conservation of Historic and Artistic Works
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Compiled by Jill Whitten

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ERASING THE BOUNDARY BETWEEN THE ARTIST AND THE CONSERVATOR

by Joyce Hill Stoner, Professor and Paintings Conservator
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Since attending a conference on the conservation of contemporary art in Ottawa in 1980, I had been hoping to follow in the tradition of a number of the speakers and help to advise living artists about their materials and techniques. With the current enhanced emphasis on preventive conservation, consulting with artists about their materials during the creative process seemed to be a timely pursuit. Discussions among the 1980 conference participants emphasized some of the challenges and pitfalls of such collaborations. Do conservators really know enough at this time to provide authoritative answers about materials and their use? How much is it appropriate for conservators to interfere with creativity? David Bomford, Executive Director of the IIC and the first conservator chosen as a Slade Professor at Oxford, has brought the "Heisenberg Uncertainty Principle" into his discussions of conservation issues for his Slade Lectures on "Art and Uncertainty." This principle is again appropriate when working with living artists. Will the act of observing a phenomenon change the phenomenon? Some scholars have suggested that the pressure of having his techniques photographed by Hans Namuth caused Jackson Pollock to begin drinking again. Willem deKooning consulted in the late 1970s with a conservator in a major American museum who bemoaned the problems associated with treating his works. This included his use of safflower oil whipped into his paints in the 1960s, which caused some of his paintings from the 1960s to stick to the glassene paper. (I quote here from Susan Lake's excellent dissertation on the techniques of de Kooning.) According to his dealer Alan Stone, after de Kooning's consultation with a conservator, the artist was so discouraged that he stopped painting entirely for an extended period of time. Therefore, working with artists should be approached carefully.

I first met Jamie Wyeth in 1982 and Andrew Wyeth in 1997. I was asked by the Delaware Art Museum to prepare a catalogue supplement about the techniques of four generations of American artists, Howard Pyle (1853-1911), N. C. Wyeth (1882-1945), Andrew Wyeth (b. 1917), and Jamie Wyeth (b. 1946). The study brought out fascinating interrelationships as seen through brushwork, use of varying paint media, and the depiction of light. Howard Pyle was known as the "Father of American Illustration" and was praised in print by William Morris, Joseph Pennell, and Vincent Van Gogh. Pyle had over 100 students; his outstanding student was N. C. Wyeth, often considered the most successful American illustrator of the first half of the 20th century. N. C. Wyeth was the only teacher of Andrew Wyeth, sometimes known as the most famous or most popular living American artist. Andrew's first one-man show of watercolors in New York at the age of 20 sold out during the first day. He creates works of metaphoric and altered realism expressed largely in egg tempera on panels and watercolor or drybrush on paper. Jamie Wyeth, son of Andrew, student of his father's sister Carolyn Wyeth, also had his first one-man exhibition in New York at the age of 20. Jamie's works remain popular with numerous collectors; he has painted animals, portraits, and eerie dreamscapes in oil over a career of thirty-five years and counting.

All four of the artists listed above, in past writings or current interviews, have denied the importance of "technique" and resisted or resist discussing their materials. During the course of my studies and interviews, I have now treated about 33 paintings by Andrew Wyeth and six by Jamie Wyeth, and have carried out treatments on other paintings they own, especially by Howard Pyle, N. C. Wyeth, and Rockwell Kent. Betsy Wyeth (Andrew's wife, curator, and occasional model) told me that "artists do not like to hear what is wrong with their paintings"; this of course complicates the writing of condition reports.

At some point, a noted US conservator apparently chided Andrew Wyeth directly about his techniques; this did not aid future open dialogues between the artist and the conservator. Andrew Wyeth's tempera paintings on panel often present at least three issues for conservators that I will discuss: insecurities in the paint film, occasional varnish removal, and a white efflorescence from the egg medium. Andrew Wyeth learned the tempera on panel technique from his brother-in-law Peter Hurd (1904-1984), another of N. C. Wyeth's pupils. Hurd was from the southwestern US and began using egg tempera on gessoed Masonite panels in pursuit of a dry fresco-like surface cousin to that of the Mexican muralists. Hurd first began using this technique on a Brandywine Valley mural for a dining room in a Wilmington home in 1932.

In my first interview with Andrew Wyeth, August, 1997, Wyeth told me that he used the full traditional Cennino Cennini egg tempera technique complete with green underpainting for a 1938 portrait of his friend Walt Anderson. As he had done with many earlier interviewers, he gave me a handout of the Hurd version of Cennino

Cennini's method, but it didn't match what I had been seeing. I asked, "but you don't do this now, do you?" He smiled and said, "No, not anymore"! Wyeth has been repeatedly burned by the press and has no reason to coddle interviewers. He enjoys being elusive and perpetuating certain myths. His paintings reflect elements of himself—seemingly straightforward yet incorporating hidden messages that can be playful or lethal. A November 15, 1998 book review in the *New York Times* called the family style "the weirdly cryptic" combined with "the excessively plain spoken" and referred to the Wyeths as "The Pennsylvania Bruegels."

Wyeth works in both tempera and watercolor. He has said that watercolor "perfectly expresses the free side of his nature." A description from his biographer Richard Meryman recounts:

> Every watercolor has been like a battle, the outcome constantly in doubt. His breath fast, talking to himself, the glasses he wears paint-spattered with color, he attacks the paper with a frenzy, scratching it with the end of his brush, scraping it with a razor blade, dabbing at it with Kleenex. His watercolors often contain straw or grass, gouges from the assertiveness of his touch, splashes from temperas carried out nearby, or dog paw prints; he throws many works on the floor while he is working.

Andrew Wyeth sees a danger and deadliness in "technical perfection" and uses his tempera medium in nontraditional ways. He told Thomas Hoving, former Director of the Metropolitan Museum, "now and then I have to take something and push it just as hard as I possibly can." He sometimes builds his tempera paintings layer by layer, comparing them to tapestries or his wife Betsy's knitting.

This multiple layering, sometimes caused by changing the location of a compositional element, can cause tiny flake losses in the tempera. In the tempera painting *Tenant Farmer*, (1961, Delaware Art Museum), Wyeth changed the placement of the roofline. The thicker areas of the tempera applied on top of previously dried tempera are insecure. I have found these flakes to set down readily with heat and BEVA 371 or Aquasol 200 in isopropanol with a bit of water added for softening.

Another cause for paint insecurity may be the relative thirstiness of the preparatory gesso on the Masonite panels that have come from multiple sources over the last 60 years. In the tempera painting of Karl Kuerner's breakfast table, *Groundhog Day*, (1959, Philadelphia Museum of Art), Wyeth changed the location of a cup and saucer, scraping away the gesso in the pattern of a crater. The paint is secure within the scraped crater, but demonstrates cleavage around the edge of the crater; this may indicate that the thirsty gesso had robbed the paint of some of its necessary binding material. [Special thanks to Suzanne Penn, paintings conservator at the PMA, for her discussions with me with regard to this painting.] I brought this information to the artist who immediately asked if he should size the gesso before painting on it. My best guess was "yes, I think so" but of course my answer was an educated guess, especially considering the many variations among the panels from different sources. I have explained that as conservators we start the answer to almost any question with "it depends."

When the flaking is consolidated and losses inpainted, the dryness of the tempera surfaces should be maintained. Tempera as a medium is associated with dryness in the mind of Andrew Wyeth. He compares its quality to "a cocoon-like feeling of dry lostness—almost a lonely feeling," "an Egyptian mummy, a marvelous beehive, or hornet's nest." He has said:

> Oil is hot and fiery, almost like a summer night, where tempera is a cool breeze, dry, crackling like winter branches blowing in the wind. I'm a dry person, really. I'm not a juicy painter. There's no fight in oil. It doesn't have the austere in it. The difference is like the difference between Beethoven and Bach.

Both his subjects and his media have emotional and autobiographical associations.

The artist calls the dry, gray clapboards of the Olson house in Maine (site of the famous painting *Christina's World*, 1948, Museum of Modern Art) "a tinderbox, that crackling-dry, ancient, bones type of thing." A visit to the Olson house deepens the surrealistic, dry, dusty, lonely feeling. The house has been preserved with

distressed surfaces of torn, faded wallpaper, cracked grainy plaster, dog claw marks on the door, and worn wood grain floors on which sharp geometric boxes of sunlight and shadow are projected through the windows. Reproductions of the Wyeth paintings related to each room are on display; this also provides a clear lesson in how Andrew Wyeth re-constructs and simplifies what might be considered reality. There is a guest book for visitors to record impressions. Testifying to the importance of dustiness, one visitor wrote of the pleasure of having his dust mingle with the dust of Christina Olson and the dust of Andrew Wyeth.

Before his real assimilation of the dryness of tempera, Wyeth mentioned that he had varnished paintings such as *Night Hauling* of 1944; he has now requested that the shiny golden coating be reduced. (This painting had both wax and varnish coatings, and at this point, I understand from Thomas Branchick of the Williamstown Art Conservation Center, that the wax has now been removed, reducing the yellowness and the impression of shine.) *Toll Rope* (1951, Delaware Art Museum) had also been varnished, but apparently under the aegis of a dealer, and there was overpaint below the varnish. Wyeth approved my removal of varnish from *Toll Rope*. With varnish removal, the surface of *Toll Rope* changed from a slick surface resembling an art book color plate to reveal dusty topography of wood grain and rope fibers.

In the case of *Toll Rope*, Wyeth's signature had become embedded in the dealer-applied varnish; I had carefully cleaned around the signature under the microscope, leaving it as a slightly shiny plateau. Andrew's son Jamie visited the studio and said "oh just take that off, and Dad will put in a new one." My next adventure (carried out after lengthy consultation with the Director of the Delaware Art Museum who said, "make sure he's healthy and standing beside you") then involved the actual removal of this signature while the artist stood by and carefully replaced it. Of course, now a 1951 painting has a 1998 signature. For a time Wyeth had a conservator wax his paintings. He visited the paintings conservation studio at Winterthur almost once a month over the last year (1999-2000), and on one occasion told two of our Winterthur/UD Program in Art Conservation paintings majors how he had changed his mind about waxed surfaces and has asked me to remove wax from several paintings.

Conservators who work with living artists also learn never to generalize about their preferences and to proceed only painting by painting. In contrast to the above scenarios, Andrew Wyeth has requested that *Oil Lamp* (1945, an indoor portrait of Alvaro Olson, privately owned) remain varnished. This works well because the varnish provides a golden mellowing tone suiting the lamplight in contrast to the bright clear sunlit sky of *Toll Rope*. Andrew's father, N. C., varnished his temperas lending them a juicier surface, and this painting was in progress when N. C. Wyeth was tragically killed when his stalled car was hit by a train.

A third concern with Andrew Wyeth's works involves the periodic appearance of a powdery white efflorescence. Egg tempera paintings by Andrew Wyeth, Mark Rothko (1903-70), George Weymouth (born 1936) and the British tempera revival painters such as Joseph Southall (1861-1944) or Edward Wadsworth (1889-1949) all may occasionally exhibit this efflorescence on the surface of the paint. (We heard a very useful talk on analogous efflorescence on a Frank Stella oil painting at AIC 1999, St. Louis, from Bonnie Rimer and Inge Fiedler.) The white powder from Wyeth temperas has been analyzed (by Lucy B. McCrone of the McCrone Research Institute in 1986, Beth Price of the Philadelphia Museum of Art in 1994, and Janice Carlson of Winterthur Museum in 1997) to be a stearic or palmitic acid exuded as the egg medium matures and ages. There are variations in the form of the efflorescence, ranging from a powdery snow-like dust to a crystalline latticework. The efflorescence can be brushed away with silk or a dry paint brush or removed with Shell solv and silk, but it seems often to return. Wyeth paintings in various locations and museums have been waxed, varnished, or placed in a climate control boxes, but may continue to effloresce. One painting completed in fall of 1997 had been showing new efflorescence biweekly. Wyeth had previously been told this efflorescence was mold and unfortunately had some of his works needlessly and possibly excessively fumigated. (Other works have actually shown mold due to damp storage conditions, complicating the dialogue.)

We have now learned that the best way to prevent efflorescence is to coat the tempera; I am working with ways to do this and preserve the dry, dusty quality. Wyeth had given me a fragment of a tempera painting to test (*Off at Sea*, 1972) that became useful for this investigation. With his permission and often standing by, the artist has now had me put a 4% solution of Paraloid B-72® in xylene with a tiny admixture of wax on a few selected tempera paintings, and I have tried to do this as invisibly as possible. (It is usually entirely absorbed and invisible or imparts a slight "richness" that the artist likes.) The painting from 1997 that effloresced bi-weekly was coated in June 1999, and the efflorescence has been greatly reduced.

We do not entirely understand why some temperas effloresce often and some never do. Efflorescence is exacerbated by high humidity but not contained in low humidity. It is not pigment dependent. At first I thought it might be stearates in the panel support, but when the artist actually uses tempera in sections of a watercolor on paper, these areas may also effloresce. Clearly the source must be the egg in the tempera. Our best guess to date, with advice and consultation from Michael Schilling of the Getty Conservation Institute, is that the efflorescence is worse in a painting that undergoes severe fluctuations in climate in the first year of its life. Schilling suggested that the free radicals are formed early in the life of the tempera and then will exude out slowly. Wyeth took the painting that effloresced bi-weekly from Pennsylvania to Maine to finish. Schilling's explanation has proven the most likely to date.

The title, "Erasing the border between the artist and the conservator," was suggested by Richard Wolbers after he witnessed my treatment of an early tempera sketch on panel Wyeth made for the major tempera *Roasted Chestnuts* (1956, Brandywine River Museum). This small painting had apparently been in below-freezing temperature when the gesso was damp; about 30% of the gesso froze, expanded, and flaked off. (The exposed areas of loss revealed another painting below that the artist identified as an early study for *Groundhog Day*, PMA, discussed above.) Betsy and Andrew Wyeth had not expected that this painting could ever again be exhibited, but I am proud to report that it was on display at the Brandywine River Museum in summer 2000. A previous conservator had done some consolidation with wax. I followed this with BEVA 371 and filled the numerous losses. Using other sketches for the same painting and the large, final tempera as sources, I reconstructed the losses in the Eisenhower jacket, the knitted cap, the scarf around the neck, and the loosely (highly irregularly textured) painted brownish sky.

The tip of the nose of the figure of the boy (Allan Messersmith, who actually sold chestnuts outside the Delaware Art Museum for fun when this painting was first exhibited) had been intact before my treatment. However, when the artist visited Winterthur in the fall of 1999 to see the completed treatment, he approved what I had reconstructed but decided that he was not happy with his own drawing of the nose in this painted sketch. He redrew the end of the nose with pencil (Eberhard Faber 2 HB) over his original end-of-nose painting (which was not damaged) and re-defined the cheek and eye socket. He told me to use the same red paint that was on the nostril in the higher part of the cheek and to make the nostril larger, similar to a painted sketch of just the head of the subject. My goal was then to make his pencil lines permanent and my inpaint on top reversible and removable. I experimented on a small unfinished section of the panel from *Off At Sea* (mentioned above), and wrote out letters "A" through "I" in pencil, and coated "A, B, C" with Paraloid B-72® in xylene, left "D, E, I" uncoated, and coated "F, G, H" with poly(vinyl acetate) AYAA in toluene. I then inpainted out the letters "A" and "F" using Regalrez in benzine and dry pigments. Next I removed my inpaint with benzine from the "A" and the "F." The "A" was affected (B-72 proved to be too reversible itself, even in benzine), but the "F" looked exactly like the uncoated letters, so I sealed and isolated Andrew Wyeth's pencil on the *Roasted Chestnuts* sketch with the PVA and inpainted as he instructed me using the reversible Regalrez system. He looked at it again and approved.

Discussions with colleagues after I presented this as a talk at AIC, Philadelphia, brought up additional points that I can mention here. "Since I worked directly with the artist and the next conservator may not, *should* I have been so "reversible" as what I did had the artist's blessing?" Good point—perhaps I should not have been. "Was I now acting more as the artist's studio assistant rather than a conservator?" Yes, partly. I noted at the Association of British Picture Restorers conference on inpainting held at the National Gallery, London, September 22, 2000, that one of the speakers, Philip Young, said that as a conservator and advisor to contemporary artists he often temporarily became a "studio technician." But doesn't our conservation training prepare us to be useful in this context?

Other recent adventures with Andrew Wyeth include collaboration with Michael Podmaniczky, wooden objects conservator at Winterthur, to cut down the size and format of a tempera panel from in the early 1990s and a collaboration with Richard Wolbers to create a gel for me to remove an animal from a Wyeth tempera painted a year earlier. He wanted the animal to be present only by its footprints in the snow. On another occasion I was asked to look at a mural of vultures Wyeth had painted on a fireplace for a home in Chadds Ford about 40 years earlier. He cautioned me that if I was asked by the current owner to clean it, *not* to remove the black smudges at the top of the open plaster fireplace. He and the previous owner had burned a mattress in the fireplace to create that sooty patina. I had been hoping to be able to watch Andrew Wyeth paint; this happened unexpectedly in May 1999 when he asked

me to pose for a watercolor portrait. He actually gave the painting to me for the following Christmas. I am, of course, uniquely concerned about the preventive conservation of this work. And after seeing a watercolor preservation lecture by Leslie Paisley at the Williamstown Art Conservation Center, I ordered a special shade, usually kept drawn in the high light levels of our paintings conservation studio.

Jamie Wyeth uses oil paint on canvas or panel, charcoal, pen-and-ink or watercolor illustrations, and mixed media on toned boards. His choices of vehicles and subjects are distinctly different from those of his father. Jamie Wyeth's love of the medium of oil dates from oil paint tubes left in his aunt Carolyn Wyeth's studio. He noted:

> When I was six or something I would walk in and see it squirt—burnt sienna and raw umber, and I swear that is the only reason I got interested in oil. Just the consistency looked so wonderful. And then I tried them. My father works in tempera which I did try. All the properties he likes I dislike and vice versa. I like the moistest ones. He likes the dryness of tempera. I think these choices are purely personal.

To paint accurate humans and animals, Jamie Wyeth has dissected corpses in a NY morgue, collected taxidermy specimens, kept a wolf in his living room, studied sharks in a specially built tank, constructed a studio in his barn, and raised an abandoned vulture. He has recently devoted hours of study to ravens and gulls, luring them with carcasses to his island home. He has noted that when he paints outdoors, insects are often entombed in the paint; he feels they should be left as is.

In the 1960s and '70s he painted a number of paintings featuring the textures of latticework or wicker; these surfaces reveal copious scrapings and rubbings. The artist explained his "subtractive" methods for both oil and watercolor to me in 1982:

> To take it right down to either the canvas or to the paper, you lift off when it is wet, either with your finger nail or with a knife or with whatever tool you have at the time. And then of course it leaves some residue of color but it creates a sort of void that has been left. [He noted that restorers have sometimes retouched such intentional voids in his father's paintings such as highlights in a metal stove which he had gouged into the white watercolor paper.]

Accents in texture and variation in surface gloss are another unique attribute of Jamie Wyeth's work. For at least three paintings Jamie painted accents composed of essence of pearl; he has ordered a mixture of ground-up pearl in an oil medium which creates a pearly opalescence in the final surface. This unusual effect is visible in the stars and comet in *Comet* (1997, MBNA collection). On some of his recent works, the artist has added extra varnish to selected areas of the paintings, causing conservation concerns analogous to works by K. Malevich (1878-1935) or Juan Gris (1887-1927). The top of the lighthouse of *Comet* has enhanced varnish. Two paintings of the same troubled looking young woman of the 1990s, *Sunset, Southern Island* (1995) and *If Once You Have Slept on an Island* (1996), have intentionally glossy surfaces on the face of the sitter or the pane of glass over her face. Sometimes he varnishes just the eyes of his animal paintings for enhanced local gleam of expression. Such special effects are often changed by conservation treatments; a conservator might misunderstand the artist's intent and apply an overall varnish to homogenize the surface. Several earlier works by Jamie Wyeth that he had varnished only locally were later varnished overall; he described one looking like an "ice skating rink" or a "bug in ambergris."

I have recently had a collaborative treatment adventure with Jamie Wyeth. His 1972 portrait of Jean Kennedy Smith was vandalized while on exhibition in Ireland; each eye was punctured. Both the artist and the sitter/owner wanted me to do the structural work but have the artist do the inpainting. I set down the curled canvas and surrounding paint using BEVA 371, made reinforcements on the verso using "BEVA Band-Aids" of BEVA on Stabiltex, filled the (ca. 2-3 mm in diameter) pricks with gesso, and delivered the painting to the artist's Chadds Ford studio (about half a mile from the back gate of Winterthur). I was concerned that he might not keep his retouch within the bounds of the losses and asked Herbert L. Crossan, our Winterthur conservation photographer, to take ultra violet photographs of the eyes beforehand. Jamie requested enlarged details of the 1972 photographs from his curator, Lauren R. Smith. The painting was gone for two months, and he told me later that the retouching was much more difficult than he had anticipated. He did the retouching in oil, but examination under u.v. upon the return of the painting revealed that he has stayed precisely within the bounds of the losses.

After I presented this portion of the talk, colleagues made additional useful comments. (The remarks regarding my work with both artists reminded me how advantageous it is to discuss these issues openly.) "What happens in twenty-five years when another conservator has to treat this? Will they realize that the artist himself did the retouching of these eyes? It will appear under u.v. examination to have been a treatment by a conservator." Another excellent point. The curator mentioned above, Lauren Smith, a graduate of our program who has shifted to curatorial work, promised to write on the back of the stretcher that the artist had done the retouching in the year 2000 when the painting was exhibited at the Farnsworth Art Museum. [She was to co-author this paper with me, but her curatorial duties with regard to her August 2000 exhibition and catalogue on N. C. and Jamie Wyeth's works precluded her participation.]

Both Andrew and Jamie Wyeth are artists who have attained exceptional commercial success, but both continue to get up before 6:00 a.m. and spend most of each day painting, seven days a week. Known as reclusive and elusive, at first neither artist would answer direct questions or openly discuss longevity of their works, but Lauren Smith and I have worked to establish an open exchange with the artists, their wives, and other colleagues about materials, storage, and shipment. Both Andrew and Jamie have given us panels to test for them at Winterthur. Jamie quizzed me about the longevity of cardboard; he has painted marvelous portraits of Andy Warhol and Rudolph Nureyev on large sheets of brown corrugated cardboard. With the advice of paper conservator Betty Fiske we recommended Dieu Donné in NYC, a paper maker who could make archivally sound cardboard for his mixed media works. (He was pleased that this supplier could make archivally sound cardboard that resembles regular cardboard.) Lauren has actually worked with Jamie at the press to tailor-create paper for certain of his works and regularly answers his questions about adhesives and varnishes.

I also prepared a slide lecture on the work and techniques of Andrew Wyeth to accompany exhibitions at three museums and was able to give the artist and members of his family and staff a private preview. His reactions to the talk deepened my understanding of how an artist views our world, our language, and our thought processes.

Lauren Smith and I have been privileged to be among the first viewers to see new works by both artists, a situation when one is acutely aware of the artists' antennae, finely tuned for the smallest reactions. Sometimes, after contemplating his own reactions and the reactions of others, either artist may adjust a work. On an afternoon in Maine in August of 2000 Andrew and Betsy Wyeth decided to change the color of the frame for his newest tempera and asked me to repaint the frame at that instant. I ended up mixing and painting tempera with him in his Cushing studio which gave me further insights into his methods. Will the act of observing the phenomenon change the phenomenon? Possibly. This reminds us all, "be careful what you wish for."

THE MATERIALS AND TECHNIQUES OF MARTIN JOHNSON HEADE

Elizabeth Leto Fulton, Assistant Conservator of Paintings*
Jean Woodward, Associate Conservator of Paintings*
Jim Wright, Eyk and Rose-Marie van Otterloo Conservator of Paintings*

Introduction

The following paper focuses on the results of technical research on 37 paintings by 19th century American artist, Martin Johnson Heade (1819-1904). This study, funded in part by the Samuel H. Kress Foundation, has taken place at the Museum of Fine Arts, Boston, which houses the largest collection of Heade paintings and drawings. The paintings came mostly from the permanent collection, as well as from other institutions and private collections. From September of 1996 in the first half of the study, Heade paintings were brought into the paintings conservation studio for a systematic examination and extensive photodocumentation. The examination also included ultraviolet light examination and infrared reflectography whose images were captured and saved when appropriate.
The goal of the project was to describe and document Heade's painting techniques and materials with the hope of establishing a chronology of undated paintings and to help the art historians distinguish Heade's paintings from other artists of the time.

The second half of the research that began in March 1998, consisted of a review of 22 of the initial 37 paintings. The 22 paintings were chosen largely because they were dated, or they were of particular interest, i.e. pivotal paintings or anomalies from the normal trend found within a given period. These paintings were analyzed at the MFA under the supervision of Richard Newman, Head of Scientific Research and Michele Derrick, Contract Research Scientist. The diagnostic techniques electron microprobe analysis, FT-IR spectrometry, and polarized light microscopy were used for pigment identification.

Historical Background

Heade used materials for painting which were widely available during his day. Although he apprenticed with Edward Hicks, he was largely self-taught incorporating into his repertoire the methods he admired most in other artist's work. He was a cautious, calculated and steady painter judging by his working methods. Not relying on extensive underdrawings, he was very precise about his final compositions making small changes in contours, or completely moving major compositional elements in the upper paint layer. Once he perfected the desired form of the compositional elements, he would add that particular motif to his repertoire repeatedly using them in other paintings. This method of repeated motifs was found to be especially true in his still lifes, beginning with the orchid series, cherokee roses, and ultimately in his magnolia still-lifes in his later work.

One of the most notable influences on Heade's work was the work of the American and English Pre-Raphaelites. Heade had possibly seen their work in a show in either New York or at the Boston Atheneum in 1858. Seen in the comparison of Heade's *Lake George* 1862 and Charles Herbert Moore's *Rocks and Water*, 1860s, these early landscapes depicting rocks in the foreground demonstrate the influence on Heade in the use of high-key colors, crisp painting, and equal emphasis of foreground and background details. Another major contribution to the methods and style of Heade's work was the influence from the artists in the 10th Street Studio, NYC where Heade had a 3-year stint. It was there he was in contact with his neighbor Frederic Edwin Church whose studio he initially used until he had his own. Another neighbor's influence, that of John Frederick Kensett, can also be noted in Heade's *Approaching Storm*, 1861-2 and Kensett's *Seascape, Newport* 1857.

Very few records are extant indicating Heade's technique or purchase of artist materials, so most of the following information is taken from the paintings themselves.

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Supports

Most of the canvases examined during this study were medium-weight, simple weave, linen-type canvases most commonly used by artists of the mid to late nineteenth century. The majority of examinations of the supports were done in areas of paint loss or occasionally through thinly painted areas. A few examinations were performed from the reverse or along the tacking margins when they existed, since the majority of paintings were lined with their tacking margins removed. In these cases where the tacking margins existed, seen from the reverse, in the four corners, small "tabs" of preprimed canvas were folded over and tacked on to the reverse as in *Woodland Sketch* from 1863. This method of stretching is not unique to Heade's work, as these tabs are frequently found on other paintings contemporary to Heade's, by Boston-based artists.

Heade also occasionally used a double-threaded, simple weave canvas seen in *Mary Rebecca Clark*, 1857 in addition to simple weave with single threads in one dimension and double threads in the other found in *Stranded Boat* 1863. Twill canvas was also found on *Rocks in New England*, 1855, in addition to a few examples of artist board in other paintings.

The landscapes and seascapes were painted on canvas typically stretched on 4 or 5-member, expandable key stretchers as seen in *Off Shore, After the Storm* from 1861-3. Stretcher type was usually limited to standard dimensions. However, it is likely that Heade special ordered his prestretched canvas in non-standard dimensions, emphasizing the horizontal dimension which he preferred for his landscapes and seascapes as in *Newburyport Marshes*, 1866-76. This 1:2 format, which is not unique to Heade's work was also found in some of Heade's still lifes both in the horizontal and vertical orientation seen in *Orchids and Spray Orchids* , 1875-90.

Ground

Heade must have been aware of the importance of the aesthetic role of the ground in luminist paintings as he exploited these effects rendering brilliant colors in his paintings. Heade generally used commercially available preprimed and prestretched canvases. Of the 22 that were thoroughly analyzed, it was noted that 2 early portraits, *Portrait of a Man* 1840 (Fig. 1) and *Portrait of Ruth Scarborough* 1841, appear to have been primed by the artist. In the case of the *Ruth Scarborough*, the ground appears to be a red earth color which in selected areas received an underlayer of white paint before upper blue paint layers of the sky were applied. With the exception of the above-mentioned paintings, the majority of the paintings in this study illustrated by the tacking margin of *Sunset on Long Beach* 1867 (Fig. 2) are painted on smooth, light-colored grounds which were commercially applied in two layers. This two layer-type ground is similar to the type referred to by Joyce Zucker in the Spring 1999 JAIC article, "From the Ground Up" as the recipe "most commonly encountered commercially prepared ground structure in19th-century American paintings". According to microprobe analyses exemplified by *South American River* 1868 the grounds were applied as mixes of calcium carbonate and lead white with the bottommost layer having a higher percentage of calcium carbonate and the uppermost layer having a higher percentage of lead white which appears brighter, with lead being more prominent in that layer. The earlier portraits, *Portrait of a Man* and *Mary Rebecca Clark* appear to have one ground layer only, a mix of calcium carbonate and lead white. In some paintings, zinc was present in the ground and in others small amounts of commonly found commercial "fillers" included kaolinite, and barium sulfate as these were also detected using the electron microprobe. Traces of calcium sulfate were also found.

The texture of the ground is generally smooth and even, with each of the layers of the double grounds having approximately similar thickness. An exception is found in *Dawn* 1862 and *Vase of Flowers* 1872 (Fig. 3). In these paintings, Heade experimented with a ground that was pebbly and reticulated. In another painting called *Hunters Resting*, 1863 the ground or underlayer appears to be striated and impastoed which can be detected through upper paint layers when viewed through a microscope at 6o x magnification.

A notable phenomenon seen on Heade paintings appears to be a result of aging or drying, and it originates from the ground. It is an "oozing" effect as seen in *Heliodore's Woodstar and Pink Orchid* 1875-90, coming through the through cracks of upper paint layers. Upon sampling the oozing layer, analysis shows the presence of zinc and barium sulfate unlike paintings which do not have the "oozing" problem, and it is possibly originating from the ground or underlayer of paint. The oozing may be associated with zinc since its presence would have had a slow

drying effect. Therefore, it is possible that the underlayers were not completely dry before the upper layers were applied making it susceptible to oozing through cracks in the quicker-drying upper layers.

A final interesting aspect of the ground layer, certainly not unique to Heade, is the problem of what's been termed by paintings conservators as "ground staining". As noted by many conservators and researched by Joyce Zucker in her article, "From the Ground Up" previously mentioned, this phenomenon has been found to be in commercial ground preparations of the mid-nineteenth century. It manifests itself in dark striations, usually running vertically in the ground, seen in *April Showers*, 1868. Other paintings from the study afflicted with this problem were *Approaching Storm*, *South American River*, *Vase of Flowers* and *Stranded Boat.* This problem still remains unresolved although the Zucker article gives good insight to possible causes.

Underlayers

Underlayers of paint which set an atmospheric tone overall in the landscapes and seascapes also appear to play an important role for Heade. In some of his work, Heade chose to use underlayers selectively or continuously in one layer depending on the effect he wanted to create. One of the more prominent and illustrative points made can be seen in the eerie atmosphere created in *Approaching Storm* (Fig. 4). This painting was sampled for cross-sections on all four edges of the painting in search of a continuous underlayer. An acid green-yellow underlayer was present overall loading the painting with a feeling of tension. When analyzed with the electron microprobe technique, it was revealed that this layer mostly consisted of lead chromate. In other paintings, such as *Hunters Resting*, 1863, a warm pink undertone imparts to the painting a restful feeling of comfort in the glow of autumn sunlight, as seen by the subjects after a day of hunting outdoors.

Underdrawing

Few sketchbooks or drawings by Heade exist, so it is difficult to say how much preparatory sketching Heade preferred doing before painting. Heade did not rely heavily on complete underdrawings for his compositions. Where they existed, more frequently in the flower paintings, we found a variety of underdrawing materials and techniques that he used. The "dry" underdrawing techniques (ie pencil, charcoal, chalk/crayon) seen in the black underdrawing in the throat of the orchid from *Heliodore's Woodstar and Pink Orchid* at 60 x, seems to be the most commonly used underdrawing type throughout his career. In the seascapes and landscapes when dry media was used and detected with the Vidicon camera (Hammamatsu), it is most commonly found in the horizon line and outlining hill and mountain silhouettes only, with a lack of details as seen in *Shore Scene* 1863 in an infrared reflectogram. In addition to underdrawings in these seascapes and landscapes, are pentimenti. Changes have been noted in other paintings as well, as Heade finely adjusted the size and contours of haystacks, hummingbirds and orchids.

In some paintings, when pencil or crayon could not be found as the underdrawing medium, it seems that Heade would do an underpainting in a liquid-type medium in a carbon-based ink or in a thin dilute paint, sometimes detected as black or an umber color through the microscope. This is seen very clearly in the palm frond from *Gems of Brazil, Snowcaps* 1864-65. Given the beaded line quality in this painting, one would suspect the possible use of ink or another liquid medium.

In some still lifes and orchids, we also found a red crayon-like underdrawing material seen through the microscope and sometimes with the naked eye. The red underdrawing has only been observed in the flower paintings. Later in his career the red underdrawing became increasingly exposed and seemed to have evolved into a design element, sometimes resulting in a pinkish cast in the petals.

The flower paintings pose a unique underdrawing question since many of the orchids, magnolias, apple blossoms and cherokee roses from various paintings are almost identical in size and format. Given their similarity in size and shape, one might assume that some type of transfer method was used to replicate them from one painting to another. However, until this time, no concrete evidence can support this claim because of the difficulty in gaining access to

underdrawing media between paint layers, or lack of evidence of a transfer method, either in the form of cartoons, pouncing or incisions.

Technique

Heade painted mostly with a paste vehicular paint in a simple structure of one or two paint layers at the initial stages of his career. The paint layer is generally smooth with slight impasto in more thickly painted areas. Later on as he became more accomplished by the late 1850s and into the 60s, Heade began to experiment more with his use of impasto, even to the point where he becomes almost impressionistic, using a stippling technique as in *April Showers*, 1868. It was during this period in the sixties when Heade added to his repertoire a vocabulary of technical language not previously seen in his paintings prior to 1858. His paint structure became multi-layered during this time as his style became more sophisticated. In addition, there were many characteristic brushstrokes and techniques Heade experimented with which became his hallmarks in the 1860s.

One of the most characteristic techniques he developed was glazing over bright reflective impasto to imbue his subjects with light well illustrated in *Sunset on Long Beach* (Fig. 2) In using this device to paint areas that served the purpose of emanating light, Heade applied a thick impastoed underlayer of a bright, reflective white paint. As seen in the photomacrograph of the sun, Heade applied thin, transparent glazes on top of the bright white impasto which is poking through the peaks seen clearly in a cloud. The reason these luminist effects work so well is because of the bright white underlayer reflecting light through the glazes much like light passing through stained glass giving a luminosity and intensity of color not achievable by opaque paints mixed with white on the palette. This technique was first noted in our study in *The Swing: Children in the Woods* from 1858, a year that Heade was exposed to the pre-Raphaelites, who were known to work with these "stained glass" effects. This effect became further refined and reached it's pinnacle in the 1860s and 70s which Heade transforms into a device all his own, giving intensity to the clouds, sunsets/sunrises, orchids and hummingbirds.

There were other typical Heade technical devices used to further emphasize certain qualities of his paintings. In his landscapes, illustrated in *Newburyport Marshes* which were extra horizontal in format to give the feeling of a lowland estuary, Heade used long, blended horizontal brushstokes of complementary colors (usually dull reds and greens) to add interest to an otherwise "flat" area of painting. He contrasted the horizontal, flat middleground with detailed vegetation in the form of stippled or spikey plants. Sometimes he punctuated the foreground with flecks of bright colors, a technique most likely borrowed from Church, seen in *South American River*. He added bright flecks of colors in dark or neutral areas learning the power of the relativity of colors. This technique is later on fully expressed in paintings such as *Passion Flowers and Hummingbirds* (Fig.5) from 1870-83 in which the flower is also surrounded in the background by muted, neutral colors to further strengthen its intensity. Other techniques found in his landscapes include strokes of pure primary colors seen in a detail of the reflection in the water from *Lake George*. Lastly, worth mentioning are examples from *Hummingbirds with Nest* 1863, the use of distinctive hooked branches which are commonly found in his landscapes and hummingbird pictures.

Palette

Heade's palette in his early career was very limited to what was available in the second quarter of the nineteenth century. This is exemplified in *Portrait of a Man* where his palette consisted of lead white, bone black, red ochre, yellow ochre, and Prussian blue. Browns were mixed out of the above stated pigments. The greens in the painting, as commonly found in other paintings, were a mixture of yellows and blues rather than distinct green pigments. The choice for green may have been a result of limited availability of green pigments in the early nineteenth century.

By the 1850s we see evidence of Heade becoming more adventurous in his use of new synthetic pigments. In our study, we found that new blues are introduced to his palette when he painted landscapes such as *Rocks in New England* 1855, his choice for blue here was artificial ultramarine. In addition to mixing his greens for this painting, Heade used the relatively new 19th century pigment, emerald green, seen in a photomacrograph at 60 x magnification. One of the more curious pigments that we came across during our study was a transparent, resinous brown which is referred to as a "Van Dyke Brown", although this resinous, organic pigment is very difficult to confirm analytically. This pigment appears on his palette around 1855, the year of this painting.

Cadmium yellow is found in the gold crucifix necklace in *Mary Rebecca Clark* (1857) for the first time in our group of paintings. Also in this painting, vermilion appeared on his palette as well as a zinc containing pigment (probably zinc white).

By 1858 in *The Swing: Children in the Woods*, we see in our study Heade's first use of glazes with the transparent pigments natural rose madder and Prussian blue (already mentioned earlier in the early portraits as a mix). Also in this painting, we have found evidence of Heade's use of the "newer" chrome pigments widely used in his greens and yellows of later paintings: barium chromate, strontium chromate, lead chromate, and zinc chromate. This painting also revealed the first use of a pigment containing Tin (Sn), and it is deduced that this pigment is possibly cerulean blue.

A later painting, *Heliodore's Woodstar and Pink Orchid*, from the period 1875-90 tested positive for cobalt yellow which was mixed with Prussian blue to produce a cool green seen in some details. Heade continued this practice of mixing blue and yellow even after a variety of synthetic greens became available on the market in mid-century which he also used. Another pigment found in the study although not commonly found was viridian.

Lastly worth mentioning is that by 1861, and illustrated in *A Vase of Flowers* 1872 (Fig.5) Heade wanted to exploit all the new paints on the market seen in this painting which demonstrated the widest variety of pigments in one painting in our study. He also continued the practice of glazing rather than mixing to produce odd color combinations seen in the cross-section of the purple-brown background.

The results of all the analyses for the pigments will not be presented here, as we hope to publish the entire study soon. Analyses of paint media and surface coatings were not conducted in this study, since the majority of time was spent on grounds, paint layers and methods of paint application.

Conclusion

In closing, we'd like to emphasize that the study was made from a very limited group of Heade paintings of which about 720 are known to exist today. The results presented here can only highlight the trends that we observed to be true, but remain nonetheless a random sampling of what variety exists in his vast body of work. The study, very fortunately, coincided with the Martin Johnson Heade Exhibition that opened at the Boston Museum of Fine Arts, went to the National Gallery in Washington and ultimately closed at the Los Angeles County Museum of Art. Because of the show, we had the great opportunity to augment and confirm our findings by having so many Heades together at once, an occasion so rare, to compare to the MFA's largest public collection of Martin Johnson Heade paintings.

Acknowledgements

The authors would like to express their gratitude for having the opportunity to work on such an important collection and being so fortunate to have been funded largely by the Samuel H. Kress foundation. They are also grateful to Arthur Beale, Director of Conservation and Collections at the MFA without whose support, the study could not have happened. The importance of working collaboratively with a great team of experienced and knowledgeable conservators, scientists and curators who brought years of expertise and insight to this technical study cannot be overstated, and cannot go without mentioning. From the conservation division, many thanks to Richard Newman and Michele Derrick, in addition to seminal research which began with Jim Wright, Jean Woodward, Richard Newman with Kate Duffy, and Rita Albertson at the MFA in 1990. They would also like to thank their preparator Andy Haines and Leane Delgaizo their Collections Care Specialist for their help in the transportation of paintings. Also, with much gratitude to the art historians from the department of Art of the Americas with former chair Ted Stebbins whose has brought to the study 35 years of Heade expertise in addition to his exhibition catalogue and catalogue raisonne. And finally to Karen Quinn and Janet Comey who were contributing authors to these catalogues bringing their own unique and insightful perspectives on the study of Heade paintings.

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Fig. 1

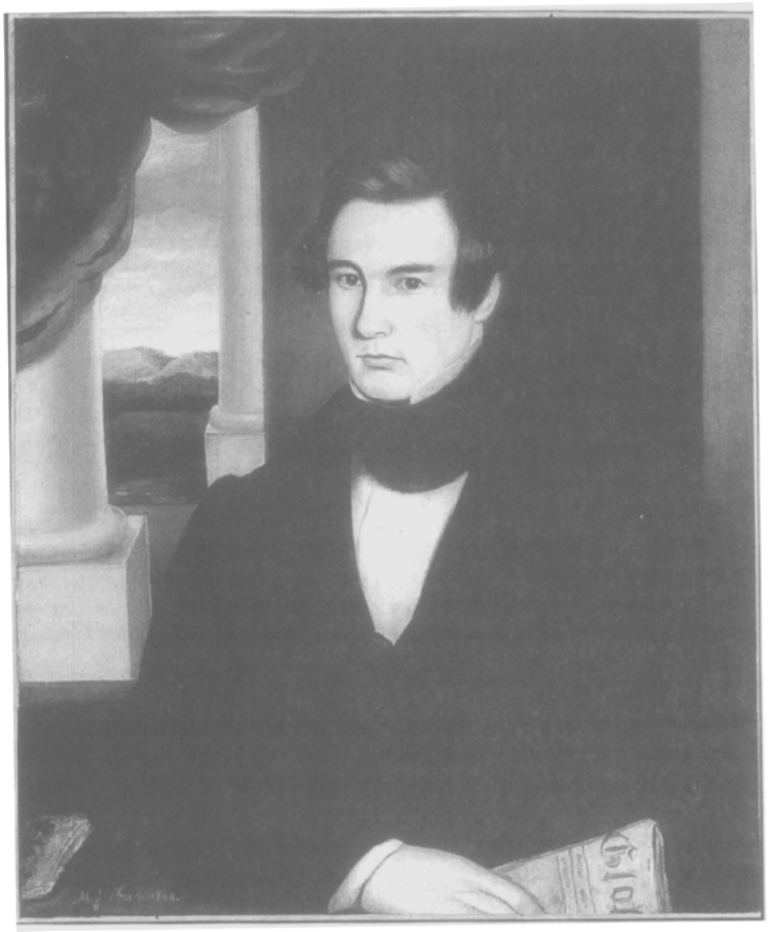

Fig. 2

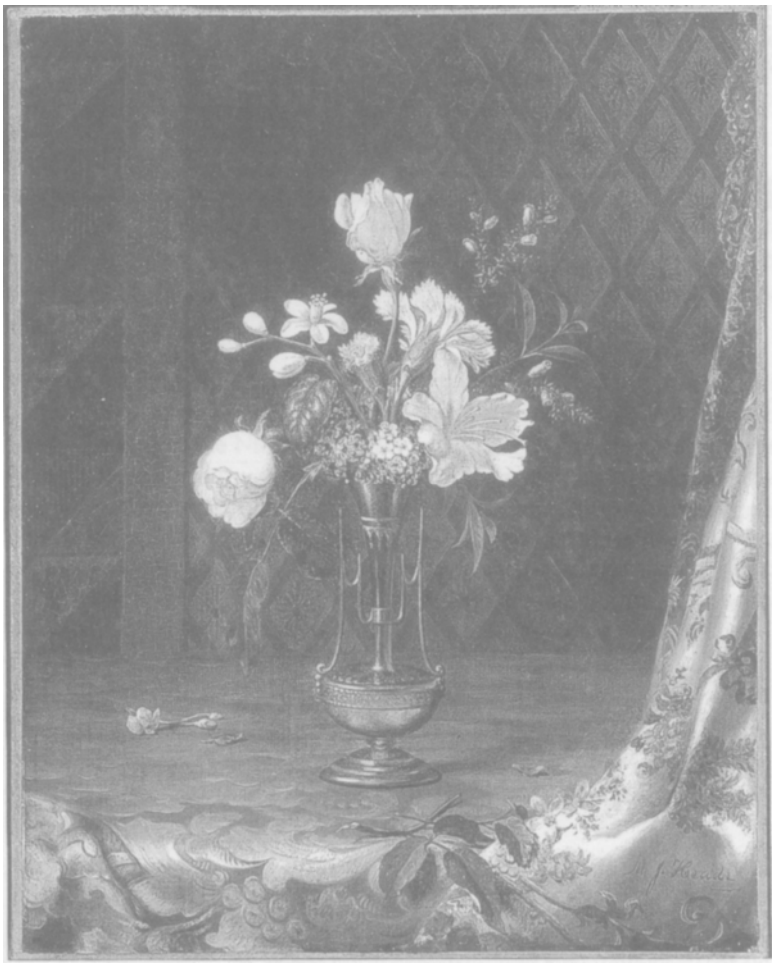

Fig. 3

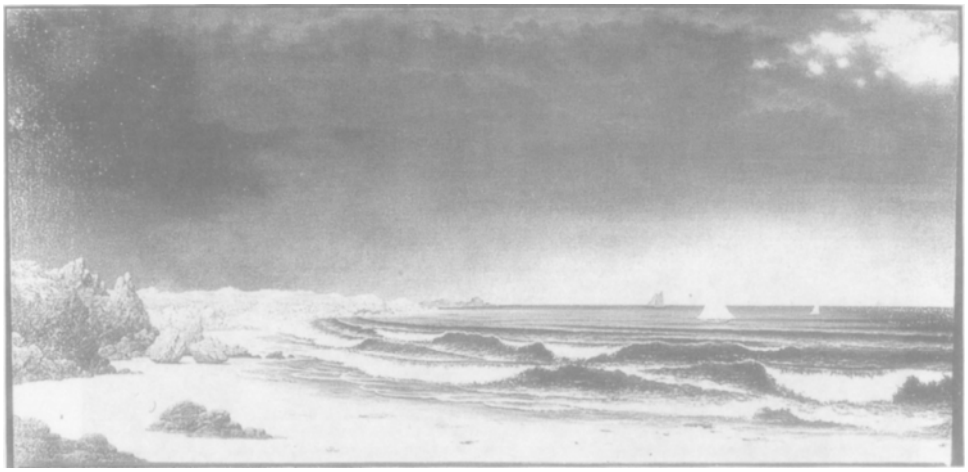

Fig.4

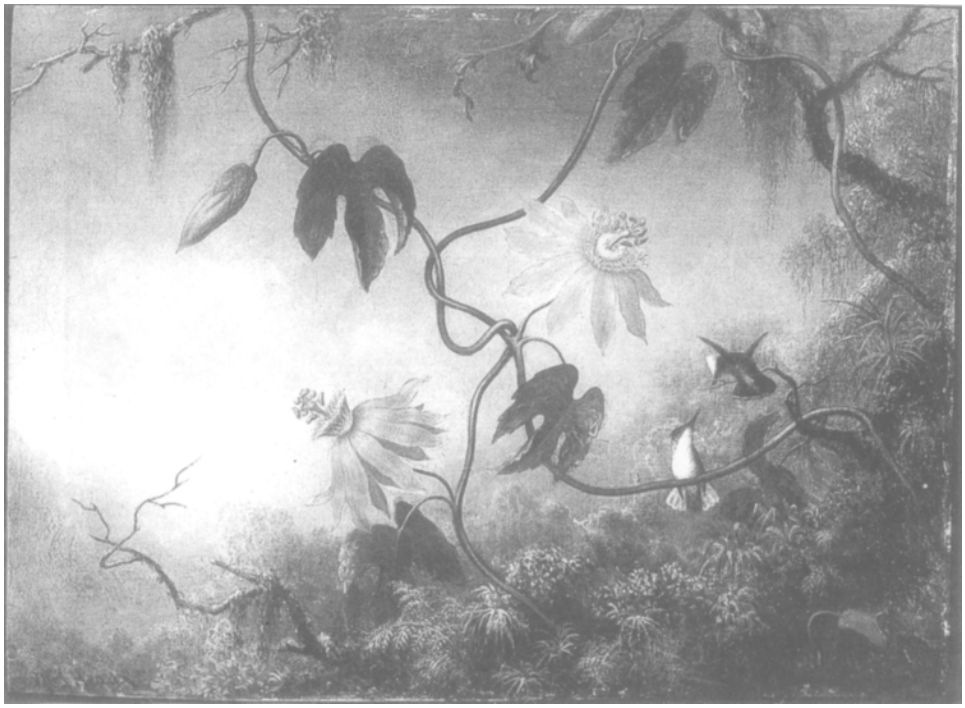

Fig.5

THE KRESS COLLECTION OF PICTURE FRAMES AT THE NATIONAL GALLERY OF ART

Nancie Ravenel
Associate Objects Conservator, Shelburne Museum

When five and dime store magnate Samuel H. Kress began collecting European paintings in the late 1920's he made an effort to share his wealth with the American public by organizing traveling exhibitions of his collection and through donations to arts institutions. To ensure that these activities would continue, he chartered the Samuel H Kress Foundation in 1929. Rather than create his own museum, Kress and his Foundation added a collection of 416 Italian paintings and 35 works of sculpture to Andrew Mellon's gift of a building and 152 masterpieces to create the National Gallery of Art in 1939.

Under the stewardship of Samuel's brother, Rush, the Kress Foundation continued to enlarge its collection in order to expand the Gallery's collection while simultaneously distributing works of art to museums all over the United States in the 1950's. In addition to purchasing paintings and sculpture at this time, the Foundation acquired approximately eight hundred antique picture frames. Each was labeled by the Foundation with a number, an attribution, and the dimensions of the frame's rabbet.

Many of these frames were restored at the Foundation's conservation facility in Pennsylvania for use on their paintings. When the Great Kress Giveaway was over, frames without paintings were given to museums to be used as they saw fit. Two hundred were donated to the National Gallery in 1961. The majority of this collection is Italian frames from the sixteenth and seventeenth century. These are primarily *cassette* and reverse profile frames but there are a few tabernacles and *tondi*.[1] Although most of the frames donated by the Kress Foundation are simply water gilded, approximately one-quarter are painted. They roughly can be divided into three types of decoration. Some are painted to imitate other materials such as tortoise shell or marble or to suggest a carved relief. Others are painted a solid color and decorated with gilding attached with a mordant such as a drying oil. The third group of painted frames is decorated with sgraffito, a technique in which paint has been applied to a water-gilded surface and then is mechanically removed in a decorative pattern that reveals the gilding below.

From 1993-1996, as a joint project of the Conservation and Design departments at the National Gallery, a database of this frame collection was begun as part of their reframing project. The database includes physical information about each frame, including attribution, joint type, and description of the frame's decoration as well as the frame's history of use on paintings at the Gallery and alteration.

Dating frames can be difficult unless provenance can be established. For the Kress frames, while individual provenances are not known, the Kress Foundation archive indicates that in the 1940s nearly five hundred frames were purchased from Alessandro Contini-Bonacossi, an Italian art dealer, who had sold Samuel Kress most of his collection. Coincidentally, Count Contini-Bonacossi had purchased about one hundred frames from Mario Modestini, who was hired as the Kress Foundation's paintings conservator in 1949.

Evidence such as labels from dealers, or previous collections, or the occasional signature can help provide clues to provenance. Other helpful markings include coats of arms branded into the back or painted on the front, and the occasional signature.

With regard to the possibility of using technical analysis as an aid to dating frames, gilding materials have remained fairly consistent over the centuries, but painting materials and their manner of application have changed. Over the course of the frame inventory and database project, the painted surfaces of a small number of frames were examined from a technical point of view.[2] While attribution is not possible at this point, the findings serve as a beginning for future work or for comparison to results on similar objects studied at other institutions.

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Where possible, frames from the Kress collection given to the Gallery in 1961 have been applied to paintings in the collection. The frame conservators consider structurally unaltered frames from the Kress Collection to be historical documents. They are great resources for making accurate historical reproductions. Copying joinery and duplicating the surface decoration, these reproductions are fabricated so that the document frame will remain unaltered. Unlike other institutions with strong collections of frames without paintings, like the Lehman collection at the Metropolitan Museum of Art and the Art Museum of Ontario, there are no plans to display frames without paintings at the National Gallery at this point. The balance of the Kress frames that have not found their way into the galleries remain in storage, where they can be accessed for future study.[3]

NOTES

[1] The following definitions of frame types were adapted from Newbery. 1990.
[2] The results of these analyses on four frames from this collection can be found in Ravenel. 1998.
[3] Inquiries regarding the frame database and collection access should be directed to Stephen Wilcox, Frame Conservator, National Gallery of Art, Washington, DC.

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HELL VS. RUHEMANN: THE IMPACT OF TWO GERMAN CONSERVATORS ON U.S. PAINTING CONSERVATION THEORY

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Conservators say that whatever we do is reversible; however, cleaning a painting may be one of the least reversible activities a paintings conservator is called upon to do. Sadly it is the most visible, most discussed, and the activity most practiced by amateurs. Cleaning controversies have been with us for quite some time. Sheldon Keck lectured on this topic at the Baltimore AIC meeting in 1983 and published his research as an article in the *Journal of the AIC* in 1984. He told us that

> complaints of damage to works of art allegedly resulting from restoration were recorded through the 15th, 16th, and 17th centuries. . . . Toward the end of the 17th century a theory emerged and continued to gain currency through the 18th, that "Time" improved and mellowed paintings, increasing their beauty, harmony, subtlety, and mystery. . . . Sir George Beaumont, a British artist who died in 1827, concisely states: "A good painting, like a good violin, should be brown." . . . John Seguier, employed at the National Gallery, London, since its founding in 1824, coated the paintings with "gallery varnish," a solution of mastic resin in boiled linseed oil, and periodically oiled them with linseed oil as they became dull or dried out. It is quite likely that by 1844 all of the pictures in the collection had acquired the mellow brown patina so much admired by Sir George Beaumont.

A number of British conservators believe that the 19th-century cleaning controversies were caused by this "gallery varnish." Charles Eastlake became the Keeper of the National Gallery, London, in 1844 and initiated a policy of picture cleaning. A controversy raged intermittently from 1846 to 1853, eventually reaching the British House of Commons. Notices appeared in the press that paintings had been "flayed," "scoured," and "scraped." Eastlake resigned in 1847. Keck reported that an investigation was launched in 1853, a 1,000-page report issued, gallery varnish was condemned, and Eastlake was appointed Director in 1855. Other similar controversies arose in England, France, and Bavaria, locations we will mention again below.

One hundred years later, a controversy raged again in Britain, intermittently from 1947 to 1963. Letters appeared in the London *Times* regarding paintings then on display in the "Exhibition of Cleaned Pictures" in 1947, in which 75 paintings cleaned during the 1936-1947 period (treatments largely by Helmut Ruhemann) were displayed with supporting records and visual material. Norman Brommelle noted in his history interview that the controversy

> gripped the entire country—everybody talked about it. People talked about it in pubs, reading the latest letters in the *Times*. The Guinness brewery ads had a laughing cavalier—one side of his face was brown with dark varnish on it, and his mouth was drooping, and the other side was clean and his mouth was smiling. The unvarnished, cleaned part was what happens when you drink Guinness. [Note: Timothy Lennon of the Art Institute of Chicago graciously contacted Teresa O'Donnell, archivist of the Guinness Brewery, to help trace this ad. As of 26 October 2000, she has been able to find only a 1934 poster with a stone statue of a strong man with a cleaner seated underneath taking a break and drinking Guinness, captioned "Guinness for Strength." We are often reminded that oral histories may be important to record legends and cherished beliefs along with verifiable facts.]

A panel was appointed and "The Weaver Report" was released in 1950 noting that the paintings had not been damaged. However, discussion continued in *The Burlington Magazine* in the early 1960s. In one of the articles published in 1962, Stephen Rees Jones of the Courtauld noted, "The controversy is not between those who favor cleaning and those who do not but rather over how far cleaning should proceed."

There seemed generally to be two camps in *The Burlington Magazine* discussion: supporters of Helmut Ruhemann and the National Gallery and colleagues of Dr. Johannes Hell, a private conservator in London. Both were important German conservators who had worked at the Kaiser Friedrich Museum in Berlin and came to London as Hitler rose to power in Germany.

An editorial in *The BM*, no. 707, 1962, noted, "Are there not cases when distortions caused by discoloured varnish are preferable to distortions caused by disparate ageing of the colours?" The editorial went on to note that Ruhemann and the National Gallery "did not think so." Twenty years ago at the Winterthur Museum, I examined an 18th-century painting by John Hesselius of a woman holding a flower with bright blue leaves. This seemed to be the phenomenon often observed in 17th-century Dutch still life paintings—the fading of a fugitive yellow pigment which leaves once-green leaves a surprising blue. What if this painting had not had yellow varnish removed? Would this have been fairer? *Not* removing the varnish would have been a reversible decision. Is that what Dr. Hell might suggest?

Let us backtrack a bit. William Suhr was paintings conservator at the Kaiser Friedrich Museum during the 1920s. He came to the Detroit Institute of Arts in 1927, after about a decade of treatments in Germany. Suhr was one of my first interviewees for the Foundation of the American Institute for Conservation oral history file, in 1977. Suhr noted in his recorded interview that Helmut Ruhemann was his first pupil. His widow has since given me copies of forty letters between the Suhr and Ruhemann, covering 1925 to 1968. Suhr, Ruhemann, and pupils of Hell all spoke highly of the Director of the Kaiser Friedrich Museum at that time, Max J. Friedlaender (1867-1958), author of *On Art and Connoisseurship.* In this book he noted that restoration was a "necessary evil" and that "more paintings have been ruined by man's hand than by time and age." Patrick Lindsay, pupil of Ruhemann, noted that Ruhemann had an interconnecting door with Friedlaender at the Kaiser Friedrich Museum and they discussed everything. When Hitler came to power, Friedlaender was replaced.

When Suhr left Berlin to come to the US, Ruhemann became head conservator until he emigrated to the U.K. six years later, in 1933, with the help and advice of art historian Philip Hendy (curator at the BMFA and later Director of the National Gallery in London). Ruhemann had studied under artists Max Liebermann and Maurice Denis and copied El Greco paintings at the Prado during WWI before working with Suhr. From 1934 until about a year before his death in 1973 Ruhemann spent most of his career as part-time lecturer for the Courtauld and consultant conservator for the National Gallery, London. He retired on his 81st birthday in 1972. Norman Brommelle wrote about Ruhemann in 1973:

> Light to him was not an enemy which damaged the objects but a friend which brought him closer to the Master. The important legacy of his work has several facets. There is a great corpus of restoration work of consistently high quality; there are the many years of tireless exposition of principles which are now accepted as commonplaces; there are his detailed studies of the technical methods of European painters in which he disposed of many fallacies; and there is his untiring attention to teaching.
>
> Helmut's strong personality, conversational powers, and distinguished appearance made him, in his prime, a formidable centre of attraction everywhere. Though of forthright views which aroused some hostility, he was never personally unkind, and his charm and politeness were unfailing.

Helmut Ruhemann has left us a rich legacy through his 1968 book, *The Cleaning of Paintings: Problems and Potentialities,* with bibliography and supplementary material by Joyce Plesters and forward by Sir Philip Hendy. He has also left a legacy through his pupils; I have interviewed eleven of his pupils or working colleagues to date including: Bettina Jessell, one of his earliest pupils, who worked with him from 1937-39; Herbert Lank, who claims the "world record" of time with Ruhemann, seven years from 1946 to 1953; Patrick Lindsay and Alexander Dunluce, now Lord Antrim, who both worked with him in the 1950s; and two of his last: Martin Wyld, who began with him in 1967, and David Bomford (1969-1972).

When Ruhemann left Berlin, he was replaced at the Kaiser Friedrich Museum by Johannes Hell. Hell has left us a legacy somewhat harder to examine: a short article on "Rembrandt's Painting Technique" in *Kunstchronik* in 1957 and his doctoral dissertation on Rembrandt's Late Drawings (published *in Repertorium für*

Kunstwissenschaft in 1930). These are publications valued highly by art historians Ernst Gombrich and Julius Held, and by Hell's pupils in conservation. Julius Held, known for his art-historical publications particularly on Rubens, once trained to be a conservator at the Kaiser Friedrich Museum and considered Hell a close friend.

Dr. Hell was born in 1897 and had painted and drawn throughout his teenage years. He was captured by the Russians in 1916 and sent to Siberia at the age of 19 where he continued to draw. His first mentor was Adolph Goldschmidt (1863-1944) who instilled in him a love of works of art and the ability to excite the same love in his students. (Goldschmidt had wavered between a career in science and art history and was known for his connoisseurship with the key component of "critical seeing," first discussed in published form in 1893.) Hell participated in Kurt Wehlte's lectures and practical classes at the Charlottenburg State Art School and became a teacher and drawing master at the Berlin State Art School and University. He gave up painting to study art history, earning his doctorate in 1928. He next began treating paintings, working first with Helmut Ruhemann and, as mentioned above, replaced Ruhemann at the Kaiser Friedrich Museum when the latter left for England.

Dr. Hell's wife was Jewish and after the Nuremberg Decrees he was told he had to divorce her or lose his position. He and his wife, Kate Hell, who assisted with inpainting, moved to London in 1937. An obituary of April 1975 noted:

> Apart from a period of nine months in 1940, when he was interned on the Isle of Man as an enemy alien, he worked as a free lance restorer, earning himself an international reputation by the quality of his work. He was entrusted with the restoration of the Dulwich Picture Gallery, when that historic collection was returned to South London after the war.
>
> He was a draftsman and painter of outstanding talent and technique. Satisfactory recreation of artistic masterpieces calls for a combination of intellectual humility and artistic drive. To have realized this in himself and to have passed it on was Johannes Hell's achievement.

Hell's influential pupils included: John Brealey, his first pupil who worked with him from 1947-51; Hubert von Sonnenburg (who was with Hell from 1958 to 1959 and then came to the Metropolitan Museum. He remembers Hell as a brilliant lecturer on artists' techniques. Von Sonnenburg carries out extensive research on artists techniques as Hell once did); and Knut Nicolaus of Cologne (1963-66). Nicolaus, during his interview by Stephan Schaefer, discussed Hell taking his pupils to the Dulwich Gallery and speaking about the paintings. He praised Hell's connoisseurship and noted that "as a great chef can talk about food and make your mouth water, when Hell talked about art your mouth would also start watering, so to say."

Hell's pupil, Knut Nicolaus, has recently published a book, *The Restoration of Paintings*, Könnemann, 1998. I hastened to purchase and read this book but sadly found that the cleaning section did not discuss philosophy or attitude, only a very direct listing of three types of cleaning: removal of surface dirt, varnish, or retouchings; and three types of varnish removal: complete, partial, and thinning. There was no discussion of when or why the choices might be made. The pupils of Nicolaus told Stephan Schaefer that he is not a "total cleaner" although this was not discussed in his book. The detailed macrophotographs in the book illustrate outstanding textured fills and invisible retouching.

Hell and Ruhemann can be said to represent two poles of philosophy, especially during *The Burlington Magazine* controversy of the early 1960s. The legacy of the attitudes and approaches of these two men can still be found today, in their pupils, "grandpupils," and "great grandpupils." If I play the game, "Six Degrees of Separation," according to the people you've worked alongside, I'm three degrees from Ruhemann and two degrees from Hell. I began trying to puzzle out the discourse when I interviewed John Brealey first in 1976, and he spoke fondly of Dr. Hell as his professor.

In the last twenty-five years I have interviewed or coordinated the interviews of 20 conservators and art historians who were associated with Ruhemann or Hell, or are known for a philosophical approach regarding issues of how far to clean a painting. I am grateful to all of these patient interviewees and my colleagues who assisted with interviews for their help wrestling with these concepts and thank them for their time and contributions. I can present only brief glimpses in this publication, but wish readers to know that all told many warm and wonderful anecdotes I wish there were space to retell. We have had a number of users who have consulted the FAIC archives of more than eighty released transcripts on these and many other topics; I believe they would concur.

I was delighted to learn that David Bomford, paintings conservator at the National Gallery, London, and Executive Director of the International Institute for Conservation, who studied with Ruhemann and then became a close colleague of John Brealey's, has been carrying out parallel activities in his research. Bomford is the first conservator to be awarded a Slade lectureship. He was Slade Professor at Oxford in 1996-97 and gave a lecture regarding the two views as "the metaphysical" and the "positivistic" in a series on "Art and Uncertainty."

In his 1987 book, *The Closing of the American Mind,* Allan Bloom decried the poverty of the American intellect because we do not have two poles to plot ourselves between, as the French have Descartes and Pascal. All interviewees generally stressed that the treatment of each painting is a separate case. However, I propose that paintings conservators and their collaborators could have the poles of:

Hell and Ruhemann
or the Metaphysical and the Positivistic

to plot themselves between as they approach each new treatment, case by case. I have found the labeling extremely difficult. These poles could also be called:

Harmony vs. Physical Fact
or Balance/Unity vs. Actuality;

Paul Philippot suggested Istorico-Critico vs. Positivism (discussed below). For the moment, I'm just using "Hell and Ruhemann."

What does it all mean? A positivistic or more "objective" approach is partly represented by the "window or box cleaning" of the Rokeby Venus by Velasquez seen on the cover of the Ruhemann book (and Color Plate F, page 295 of the Ruhemann book). The cleaned stripes in the plate indicate that the varnish was removed in straight lines as a mechanical and straightforward operation. David Bull has noted that during the cleaning of a painting, Ruhemann often looked at the work in progress under an ultra-violet light to make sure that <u>all</u> traces of varnish were removed. What Bomford has called the metaphysical approach involves a cleaning approach dedicated to maintaining balance or unity rather than aiming to remove all varnish.

Before I proceed further with this discussion, I would like to present the following disclaimers: In order to try to depict the two poles I will have to speak in <u>generalities,</u> which are always dangerous. I would wish the reader to know that I myself could say "yes, but—" to nearly anything I am about to state, but I have to try to start somewhere and trace a linear narrative and present polar concepts by trying to organize a cloud of data. Oral history has its drawbacks; tone and memory may be dependent on career turns in a certain decade or mood on the day of the interview. (One of my gracious interviewees told me later he had had a temperature of over one hundred, but I had flown to London to see him so he went ahead with the interview.) I would like to add that when an interviewee has also written articles about history and philosophy this is especially useful and provides something closer to firm ground. I would respectfully encourage all conservators to write more articles that discuss history, philosophy, and attitudes. Many of the interviewees stressed that what people say or said is not necessarily what they do or did. True. But oral history transcripts or memories of a mentor at least convey approaches or intentions with their unique values and traceable influences.

It is rarely possible today for us to see paintings that have not been re-treated since they left the easels of either Hell or Ruhemann (who have both been deceased for over 25 years). And even if we can the treatments by the two conservators were subject to the limitation of the materials; what we could see now would probably be discolored or changed in a significant way that might muddle our understanding of the practitioners' original ideas. Pupils of both aver that their teachers evolved in both methods and materials during the middle of the century and that better materials for both cleaning and inpainting are now available. And of course pupils themselves also evolved in the years following the time with their teachers. What remains and what we can discuss are <u>approaches and intentions.</u>

David Bull, consultant paintings conservator to the National Gallery in Washington, was a pupil of Hans Schubart but worked alongside of Ruhemann. He has noted that cleaning and inpainting must be considered

together. He noted that Ruhemann was especially "thorough," thorough in cleaning, removing every bit of varnish, but then inpainting very very thoroughly and very very well. Bull has been especially helpful during this research as he enjoys jumping the fence and arguing both sides, which I hope is exactly the point of this paper, not to defend one side or the other but to present a discourse with sliding applicabilities we might select for each treatment.

Bull worked for many years with another interviewee, Robert Shepherd, a private conservator in London who studied with Albert Philippot in Brussels. This moves the discussion to parallel discourses in Belgium and Italy. (There is also "Rome vs. Florence" and "Munich vs. Berlin" and many more polarities of conservation approaches and intentions.) Bull and Shepherd are British conservators who worked together in partnership during the Hell and Ruhemann years in London. They are very aware of philosophies of tonal unity and patina which have been extensively discussed by Cesare Brandi and Albert Philippot's son Paul, now available to us in English translations through the 1996 Getty Conservation Institute "Readings in Conservation" book, *Historical and Philosophical Issues in the Conservation of Cultural Heritage*. Hell and his pupils were opposed to what they call "radical cleaning" and believed in maintaining harmony, unity, and relational values during the cleaning; these concepts echo through the conservation approaches in many other European countries. Bull and Shepherd agree with these concepts but may maintain them during the inpainting stage rather than the cleaning stage.

Art historian Dr. Christian Wolters of Munich, who had recommended to Hubert von Sonnenburg that he study with Dr. Hell, and then recommended Dr. von Sonnenburg to the Metropolitan Museum in 1959, did not agree with Ruhemann's thoroughness in cleaning and inpainting. Wolters noted, "My opinion was always to do as little as possible. A museum should be a nursing home rather than a beauty parlor."

Paul Philippot, Belgian art historian, administrator, and university teacher, was an especially enjoyable interviewee. To meet with him I had to rent a car, drive three hours south of Brussels, abandon the car, and cross a footbridge carrying my camera and battery-operated tape recorder to meet with him in his electricity-free retreat in the forest. In his article, "La notion de patine et le nettoyage des peintures," *IRPA Bulletin*, 9, 1966 (translated into English in the Getty "Readings" book) Philippot notes there is a "skin" of sorts on the surface of an aged picture which "determines the particular luster of the surface." He feels that injudicious cleaning can sometimes remove the top of the patina "piercing this skin." He considers patina to be "the 'normal' effect that time has on material." He goes on to say "The conservator must also form the most precise idea possible of the original unity of the work." (This echoes the philosophy of Italian art historian Cesare Brandi; Philippot also assisted conservators Paolo and Laura Mora in the writing of their book on the conservation of murals, published in English in 1984. The Moras strove to be the practical embodiments of much of Brandi's philosophy.)

Philippot goes on to say, "Cleaning then becomes the search for an achievable equilibrium that will be most faithful to the original unity. And it is clear that the solution must be arrived at on a case-by-case basis. The cleaning of a painting can thus never be conceived of as a purely material operation and as such, 'objective.'" Philippot spoke in favor of Hell and of the philosophy represented by Hell which, as mentioned above, he felt was well described by either Bomford's choice of the term "metaphysical" or the Italian term "istorico-critico" which includes historical context and the critical eye.

I interviewed art historian Ernst Gombrich in his Hampstead home. He had noted in "Dark Varnishes: Variations on a Theme from Pliny," in *The Burlington Magazine* in 1962:

> The Shakespearean actor faced with a rhymed couplet which no longer rhymes because language changed, the musician confronted with orchestras in which a genuine harpsichord hopes to blend with violinists using modern bows, the translator of a libretto or the restorer of ancient buildings, each of them has to decide from case to case which of the necessary transpositions will do least harm to what he considers the intended tonality of the relationships.

Gombrich knew both Hell and Ruhemann and expressed confidence especially in the treatments by pupils of Hell. Gombrich said he quite liked Ruhemann, calling him "subjectively honest and well intentioned" but a "painter manqué." According to Gombrich, Ruhemann would say "I am a painter, and as a painter I can tell of every brushstroke whether it is by the master or not." He felt Hell was more factual in his art history and more modest in his approach. Gombrich wrote in his 1960 book *Art and Illusion*, "What we want [of restorers] is not to restore

individual pigments to their pristine colours, but something infinitely more tricky and delicate—to preserve relationships."

Herbert Lank (picture restorer in Britain from 1946 to 1994) worked for seven years with Ruhemann and could report on Ruhemann's strengths and weaknesses. He noted "Ruhemann would clean out all the dirt, if you like, from the hollows of grime, I would not, now, necessarily do that. I might actually leave a bit of what is not discolored varnish partly to compensate." Lank felt that "Hell was a good talker but an indifferent operator, Ruhemann the opposite."

Most British conservators found fault in Hell's inpainting, especially in comparison to the excellence of Ruhemann's. Where Hell and his pupil John Brealey note the necessity of adjusting the cleaning to compensate for changes in the relationships among the pigments caused by differential aging, Lank notes:

> Most changes are quite acceptable and preferable to arbitrary fiddling about. Not all paintings are harmonious to one's own subjective taste. It is therefore not harmony but the need to maintain an atmosphere and three-dimensional illusion within the boundaries of the frame on an essentially two-dimensional surface.

Lank points out the problem that leaving on discolored varnish may be only a "short-term fix" and feels that "any restoration needing to be done again in less than say 100 years is unacceptable." Like Bull he apparently feels that if a painting is out of key, the correction should be made at the retouching stage rather than at the cleaning stage and said "in the end, there's about three paintings a year that say, we really must do something. We must tone down the bright, because it's so out of key."

Lank calls it three paintings a year that need special attention, and Brealey had told me it was about 10% of cleanings that required balancing; some observers feel that with well painted paintings in excellent condition, cleanings by Brealey or Ruhemann would have been quite similar. David Bull noted that if you look at *Las Meninas*, which Brealey cleaned in the Prado, and then you look at the *Rokeby Venus* which Ruhemann cleaned at the National Gallery, "both are fabulously preserved paintings, and that they've both been cleaned pretty much identically." Patrick Lindsay, pupil of Ruhemann, carried out a survey of the Dulwich collection which had been treated by Hell. He said that Hell cleaned many of them evenly and completely. But when Hell left on varnish his inpainting was often not accurate according to how the picture was painted, layer by layer, as Ruhemann would have done. [I was grateful to visit the Dulwich Gallery with Lindsay in September 2000 to discuss these issues further.] Lindsay is one of the conservators who feel the difference is more in the personalities than in the treatments.

Italian conservator Mario Modestini and his wife, the US conservator, Dianne Dwyer Modestini, note that cleaning problems are different on dark ground paintings versus gold ground paintings, and that Hell and Brealey most loved Rembrandt and the Baroque whereas Ruhemann loved best the early Italian paintings. This would affect the way these conservators saw and the purity or precision of the surfaces they might most prefer or seek.

In 1985 British conservator and scientist Gerry Hedley spoke at the Canadian Conservation Institute following his sabbatical there investigating the cleaning of paintings, and his presentation was printed informally as a spiral bound pamphlet entitled, "On Humanism, Aesthetics and the Cleaning of Paintings." In June 1990, Hedley updated his concepts with "Long Lost Relations and New Found Relativities: Issues in the Cleaning of Paintings," for the UKIC conference published as *Appearance, Opinion, Change: Evaluating the Look of Paintings*. Hedley reviewed cleaning controversies, including *The Burlington Magazine* controversies, and proposed a way to categorize "Three approaches to cleaning:"

> --In complete cleaning, the aim of the technique is to remove all of the discoloured varnish and other accretions from the surface of the original paint. It is a technique best exemplified by the National Gallery in London, [Ruhemann] but is one that is also widespread in North America.
> --In partial cleaning the aim of the cleaner is to thin the varnish uniformly so that a still visible distinct yellow layer remains on the surface. This technique is common in continental Europe and is particularly highly theorised at the Louvre. . . . It has the dual function of harmonizing the relationships of colour and space within the painting, while acting as a signifier of the age, the antique character, of the work.

> --The third technique involves cleaning the paint differentially, removing more varnish from some areas and retaining more in others, with the intention of creating a visual balance. Its origins, too, are in continental Europe, though in recent years it has been most associated with practice at the Metropolitan Museum [John Brealey]. . . . Here, the restorer constantly seeks, during the cleaning, to establish a balanced set of relationships within the work.

Hedley himself seemed to have moved from a somewhat positivistic stance in 1985 to a more metaphysical stance by June 1990. Tragically, he died in a mountain climbing accident in July 1990, robbing our profession of an especially bright inquiring thinker and researcher in progress. Hedley joined Lank in saying that part of the controversy over Ruhemann's work was caused by the excellence and thoroughness of his inpainting, that he made the paintings he treated appear too finished and apparently new.

Bettina Jessell was one of Ruhemann's first pupils, working with him before and during World War II. She made a presentation at the 1976 AIC meeting about Ruhemann's exceptional skills in retouching which was later published in the 1977 *Journal of the American Institute for Conservation.* She noted in her interview that Ruhemann generally aimed to remove all varnish and present the current condition of the work frankly, even if, as in the case of some paintings by Titian, the copper resinate had browned while other pigments had not changed at all. Mrs. Jessell noted that she feels those who aim for harmony rather than the actuality of what is there—and I hope I am paraphrasing fairly here—are working for the owner rather than for the artist. Owners come and go, she notes, while her loyalty is to the artist.

Joyce Plesters, scientist at the National Gallery, London, worked closely with Herbert Lank and with Ruhemann, and she once said that Hell just "whooshed the varnish from one side of the picture to the other." Patrick Lindsay said that when asked "what about only partially cleaning a picture?" Ruhemann joked, "well you can do that if you're not being very well paid." Lank quipped that Ruhemann's view was that when you clean a picture, like the chicken crossing the road, it's better to get to the other side of the road faster than going slow, which, Lank went on to say, is actually about the opposite of what he now thinks. As mentioned above, Ruhemann carefully checked under ultra-violet light to make sure all varnish was removed.

Lank edges more toward Hell when he wrote in the Spring 1999 *Picture Restorer* that the "procedure is best accomplished by a gradual descent to the paint, achieved by a correct choice of solvent and diluent." He notes that such a slow approach allows "constant reference to what the experienced restorer expects to find in a painting of a given school and period." John Brealey praised Lank's knowledge of paintings and suggested that I send students from our Winterthur/UD Program in Art Conservation to study with Lank; lines cannot be drawn distinctly between two so-called camps.

John Brealey, the head paintings conservator at the Metropolitan Museum of Art from 1976 to 1989, trained with Hell from 1947 to 1951. He was also a pupil of Ruhemann for a brief time. As a young man unsure about his future, he met with both Anthony Blunt at the Courtauld and James Byam Shaw, chairman of Colnaghis; both said, "You were meant to be a restorer. And there's only one man for you to go to and that's Dr. Johannes Hell." Blunt and Shaw both disagreed with Ruhemann's principles, and Blunt said, "don't come here [to the Courtauld] you'll be ruined." Dr. Wolters mentioned the English wordplay in London in the 1960s: "First go to 'Ruinman' and then to Hell." (Herbert Lank noted that in 1974, Anthony Blunt told him that Blunt and the President of the Royal Academy thought that the best thing that they could do for art was to poison Ruhemann.)

Brealey taught students that cleaning a painting can never be objective; how many times you roll the swab over the surface changes the relationships between the colors and forms. He noted that there is an integrity to old varnish that cannot be achieved with newer coatings. He also spoke about restoring unity: "Discolored varnish lightens the darks and darkens the lights." If the whites have not changed at all but the surrounding areas have darkened, should the painting be cleaned so evenly that a white cloud or white collar rules the painting? I saw while studying with him as a visiting scholar in 1980, that the amount of varnish he left on a painting was rarely detectable even under ultra-violet light.

Brealey and Ruhemann both encouraged all of their students to learn as much about each artist as possible before beginning a treatment. Brealey emphasized seeing as many other works by the artist in untouched state as possible. Ruhemann emphasized the layering techniques, the painting structure, and the making of copies.

Hell pupils Brealey and Von Sonnenburg both noted the impact of adjacent paintings, lighting, and the color of wall coverings (in addition to the internal harmony of the painting). Dr. Christian Wolters noted that during the rebuilding of the Alte Pinakothek in Munich, he installed dark wall coverings and "the paintings immediately appeared brighter, and I was asked whether I had cleaned them." Whereas Ruhemann pupils—although they themselves may now pay a great deal of attention to these issues—note that this was not a topic of discussion by Ruhemann. (Conservators have now learned from Stephan Michalski of the Canadian Conservation Institute and Steven Weintraub, Art Preservation Services in New York, much more about how light and the aging of our eyes affects how we see contrasts.)

David Bomford, as discussed above, was one of Ruhemann's last pupils. He enjoys discussing the contrasts between Hell and Ruhemann. I hope his Slade lecture on the two philosophies will soon be published. He noted in his interview that Ruhemann was an objective cleaner but a subjective retoucher whereas John Brealey as a Hell pupil could be considered subjective as both a cleaner and a retoucher.

How objective can cleaning be? In "Science and the Art of Picture Cleaning" in the 1962 *Burlington Magazine*, Stephen Rees-Jones noted, "the first requirement is clearly to examine the actual nature of the boundary between the painting and its varnish." In a cross-section of paint layers taken from the Washington Allston painting, *The Taming of the Shrew*, sampled by paintings conservator Mark Aronson and examined with Richard Wolbers, paintings conservator and professor of conservation science for the Winterthur/UD Program, we could see what Wolbers calls an "interactive zone." Under the microscope using natural light we can see the red paint from Katherine's bodice blending into the original varnish, and under ultra-violet illumination we can see the fluorescing original varnish blending into the red paint film. Is "total cleaning" always or even ever really possible on a painting such as this? [In my presentation I showed a sad slide of another painting by Allston cleaned by someone with no awareness of such an "interactive zone."] Some French conservators avoid the word "nettoyage" [cleaning] and say instead "enlever" [lifting or lightening the varnish] relating to Gerry Hedley's second category, listed above. As Paul Philippot also said, one must proceed case by case.

During the examination and cleaning of some paintings we may find clear boundaries that might allow us to do more objective cleanings à la Ruhemann. In a portrait by Jacob Eichholtz, Richard Wolbers found clear boundaries. The original paint was covered with an egg white layer, next with what was probably the original mastic varnish, and then finally a dark, discolored oil film. Wolbers was able to "unpack" only one layer—the discolored oil coating—using the enzyme lipase. The paint in thin brush strokes used to delineate curls and eyelashes in 19th-century portraits may have been diluted with turpentine and be therefore vulnerable to the passes of a swab loaded with solvent. In the case of this Eichholtz portrait, after removal of only the one discolored top coating with its clear boundary, like flies in amber, wispy strokes of eyelashes and curls were revealed as untouched and clearly visible beneath the original varnish. (This varnish had not discolored probably because it was accidentally protected by a thick film of linseed oil; but now, unprotected, it may begin to yellow.)

The two opposing viewpoints of *The Burlington Magazine* discussions in the 1960s used the same American road sign quote, "Death is so permanent," for opposite purposes. Gombrich quoted it to say how irreversible cleaning is. Ruhemann wrote in his book:

> Precisely because "Death is so permanent" and indeed, perhaps imminent, nobody has the right to withhold unnecessarily any of the quality of our finest heritage while both the picture and the viewer are still alive.

What is your intention as you lift a swab to clean a painting? To remove all the varnish because it is old or work with the older materials and reduce the discolorations until appropriate harmony and visibility are achieved (which may eventually result in fairly total removal). I encourage my students to carry both of these two approaches in their heads, to have a personal debate in front of each painting they clean. Is this a painting that both Hell and Ruhemann would clean the same way, or is this one of the 10% or three a year that might need to be kept in balance? I believe that if we "drive defensively" and assume that each painting might be one of the small minority, and take down the varnish allover slowly (if possible), until we find that the surface of the painting can be freed almost entirely of old varnish and retouches and will still stay in balance, we can retain the possibility of stopping—"just in case." Not cleaning all the varnish off is "reversible." The "next guy" can clean further. Another mentor of

mine, US paintings conservator Bernard Rabin, used to say, "leave something for the next guy." Or we can always adjust contrasts and unity reversibly at the retouching stage.

As we might hope to inherit the best traits from both of our own parents or our professional mentors, and as the "degrees of separation" increase for our younger professionals, I hope they, as our successors, will create their own syntheses from this dialectic.

FAIC oral history archive interviews consulted for this article:
(The released interviews are available to consult in the Winterthur Library, Winterthur, DE 19735)

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RESURRECTING JOHN SINGER SARGENT'S *TRIUMPH OF RELIGION* MURALS AT THE BOSTON PUBLIC LIBRARY: ISSUES FOR FUTURE CONSERVATION

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Introduction

In 1998 the Tate Gallery organized the first major retrospective of the work of John Singer Sargent (1856-1925) since the memorial exhibits held shortly after the artist's death in 1925. The exhibition, which also traveled last year to the National Gallery of Art, Washington and the Museum of Fine Arts, Boston illustrated the artist's varied and prolific output of portraits, landscapes and figure studies. Visitors to the exhibition, however, could not help but be reminded of the celebrated status he achieved as the pre-eminent painter of upper class portraiture. In spite of the acclaim those images received, during the latter part of his career Sargent all but abandoned working on commissioned portraits[1]. Instead, he devoted much of his time to the production of monumental mural programs. Since all three of Sargent's mural projects are found in the Boston area, the works were the focal point of a number of intensive activities and events in 1999. A restoration of his murals at the Museum of Fine Arts, Boston was unveiled and, in conjunction with the exhibition, a symposium on Sargent's Boston mural projects was held at Harvard University[2]. In addition, a major scholarly work by the art historian, Sally Promey was published on the long neglected library murals[3]. Finally, the Boston Public Library, contracted the Straus Center for Conservation to assess the condition of the *Triumph of Religion* murals in preparation for their conservation during the next building renovation phase. The study included documentation of the materials and the condition of the murals, minor treatment, cleaning tests and preliminary analysis.

This paper will present the results of the investigation and the conservation challenges that lie ahead.
The first part of this paper will discuss the complex and sometimes controversial history of the murals, and the innovative techniques employed by Sargent. The second part will focus on the complex issues of past restorations and the present day cleaning problems. As we shall see, the conservation of Sargent Hall is complicated by a number of factors including the artist's technique, problems created by human intervention and general neglect. All of these issues have dramatically distorted many if not all of the artist's intended visual effects.

Mural Program and Its History

The *Triumph of Religion* was the first and most elaborate of the mural commissions that Sargent executed and it remains to this day an imposing yet highly enigmatic work (figs. 1 & 2). Although he had no previous experience painting murals, he was enthusiastic when asked in 1890 to participate in the decoration of the Boston Public Library. Built between 1888 and 1895 by the architectural firm of McKim, Mead and White, the building was designed to include an elaborate artistic and decorative scheme with commissions by the most important artists of the day including Puvis de Chavannes, William Austin Abbey and Daniel Chester French. For his mural decorations, Sargent chose a long and narrow barrel-vaulted hall on the third floor of the building leading to the library's Special Collections rooms. The space was originally lit from above by three skylights and supplemented by electric fixtures. The murals adorn the upper walls and ceiling of the hall which measures 84ft in length, just 23ft in width and 26ft in height. Like the other major artists commissioned to decorate the building, Sargent was given complete artistic freedom to select a theme for the space. The complex mural program, which was ultimately to be comprised of seventeen mural panels, depicts a history of Western religion.

It has been noted that the choice of subject matter for the library murals, with scenes from Jewish and Christian scripture, seems inappropriate given their public setting[4]. Certainly the narrow and confined shape of the hall does, at first sight, suggest a chapel-like space. For Sargent, however, the aim of the program was not simply to paint religious images, but rather, to depict a progress of Western religion from its pagan origins, through its dogmatic and hierarchical past to a modern notion of an individual's religious experience as a purely personal and subjective one. In the words of Sally Promey, "for Sargent this ideal was a sign of Western, especially American, progress"[5]. Viewed in this way, the library, which, among other things, stands as a symbol of the advancement of Western civilization, is a suitable place for such a narrative.

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Historians have noted that the library commission was for Sargent an opportunity "to prove himself at mural decoration, a genre he and his contemporaries judged superior to portraiture"[6]. As the mural project evolved, he in fact took on far more work and responsibility for the decoration of the hall than he, the architects or library trustees had originally expected. The project would ultimately require four separate trips to Boston where the artist made numerous refinements to the murals and even supervised their installation. Sargent labored on the *Triumph of Religion* for the better part of twenty-nine years - from 1890 to 1919, but the final mural, that was to be the focal point of the work, was never painted and thus the project was never completed.[7]

The artist painted the mural paintings in England, working for the first five years of the project in Edwin Austin Abbey's studio in Gloucestershire and afterwards at a secondary studio he set up in London nearby his established studio. Throughout the project the artist produced hundreds of preparatory sketches and even made extensive use of scale models to gauge the viewing effects. Beginning in 1895 the first group of murals was attached to the north end of the gallery. Also known as the Pagan/Hebraic end this section features images of pagan gods in the ceiling vault, a lunette illustrating the oppression of the Israelites and in the lower register the *Frieze of Prophets*.

In 1903, Sargent returned to Boston with the second set of murals which was placed on the opposite end of the hall on the south wall. Titled, *Dogma of Redemption*, the lunette features three enthroned men, representing the Christian Trinity. On the lower register Sargent painted the *Frieze of Angels* and placed at the center, is a high relief Crucifix with the figures of Adam and Eve on either side of the crucified Christ.

In the third installation of 1916, Sargent completed the decoration on the south end with images of the *Fifteen Mysteries* in the ceiling vault and in niches below two images of the Madonna. During this installation, Sargent also decorated the vaults on the east and west walls with six, lunette panels featuring scenes from Jewish and Christian scripture.

The fourth and last installation took place in 1919 with the placement of two controversial panels on the east wall over the staircase. Within the context of illustrating the progress of religion, Sargent sought to represent *Synagogue* and *Church* as antiquated institutions. Although based on medieval iconographic precedents, the images sparked a five year long debate because Boston Jews saw it as a bigoted misrepresentation. Critics charged that *Synagogue* was depicted as a fallen institution; an old decrepit figure, with its eyes blindfolded and its spiritual scepter broken (see fig 3). In contrast, they saw *Church*, which the artist meant to be seen as a rigid and fossilized institution, as a youthful and triumphant figure.[8] The controversy would be become a national debate and, in June of 1922, the Massachusetts legislature passed a bill for the removal of the *Synagogue* mural from the library. In February of 1924 a vandal splattered the mural with ink but the image was cleaned and was apparently undamaged. Two months later, after considerable legal debate, the legislature repealed the Synagogue bill and the mural remained in place. In the midst of the controversy, the reticent Sargent, though deeply troubled by the criticism, did not directly respond to his detractors. Although there were other contributing factors, the harsh criticism *Synagogue* panel evoked appears to have been the main reason the artist halted work on the mural cycle. Between these two panels remains the space that was to be occupied by the *Sermon on the Mount*, the mural that was to complete the program and culminate the "triumph of religion". Sargent in fact made several small sketches of Christ preaching to his followers, but the mural was never painted and the library cycle remained incomplete when the artist died in 1925.

Mural Technique

The commission to paint the library murals provided Sargent the opportunity to experiment with diverse materials and visual effects on the mural surfaces and also to design an entire architectural space around them. The canvas portions of the murals were painted using traditional techniques, namely oil paint on primed, linen canvas but the consistency of the paint layers varies greatly between a number of the murals. The surface of the *Frieze of Prophets*, dating from 1895, most closely resembles the painting technique for which he is best remembered; boldly applied, oil rich paint layers (see fig. 1). As for most of the other surfaces the paint layers are generally thin and more matte in appearance. This is especially true of the *Frieze of Angels*, painted in 1903, which are very matte and highly under-bound (see figs. 2 & 5). This variation in the oil content of the paint film throughout the mural cycle has had a significant impact on the previous cleanings and, as will discuss later in this paper, Sargent's painting technique will complicate the future conservation campaign. After being shipped to Boston, the painted canvasses were attached to the plaster walls of the hall by means of the marouflage technique using lead white pigment in a drying oil, adhesive paste. While painting the pictorial images, Sargent immersed himself in the production of relief elements, a mode of expression, with which he had never before experimented. With the exception of just one of the

panels, the mural surfaces are embellished using a rich variety of relief elements, which total well over six-hundred in number. These include sculptural, plaster figure groupings and relief elements made of plaster, composition, wood, papier mâché, metal, cut glass and commercial wall-covering. Most of these are gilt, painted and glazed and along many of the lunettes borders, highly ornamental stencil patterns are employed.

Sargent created his most ambitious arrangements at the beginning of the project and in this regard, the group of murals installed in the north end of the gallery in 1895 provides us with some of the most fascinating examples. Befitting their pagan themes, these murals are filled with complex and highly ornamental material. Most relief elements are composed of plaster and composition materials that were first sculpted in fine detail as positives in clay. In many instances the plaster casts were strengthened by imbedding thin canvas sections over the back of the relief elements before the plaster set. These were then gilt with gold or silver leaf and toned with oil glazes to produce translucent and highly reflective surfaces.

After producing the majority of his relief work in plaster at the north end, Sargent soon recognized that the material was too brittle for the task. This problem became evident during our study as a number of plaster elements were cracked. While working on the *Trinity* of 1903, Sargent began using more lightweight and flexible materials. On the south wall almost all the pieces are composed of papier mâché. While many of these are low relief objects subtly textured with ornate patterns many, such as the angel's wings and haloes in the *Frieze of Angels*, retain highly sculptural characteristics (see fig. 5). These were also fabricated in the same manner as described for the plaster elements, with the exception that layers of wet and dampened paper were pressed into the molds. Once dry, the surfaces of these hollow pieces were similarly treated with gold leaf and paint. They were then pinned to the wall along flat projecting edges left for this purpose.

The highly sculptural plaster *Crucifix*, with its innovative figure arrangement, confirms that, for Sargent, modeling in clay was an important technique for achieving dramatic visual effects in the gallery decorations (see fig. 2). The technique of sculpting in clay is clearly visible in the faces of the figures, especially in the head of Adam, where the tool marks are readily apparent and produce visually dynamic surfaces. The figures are thinly coated with a translucent warm glaze that gives the surface a soft luster, but the robe that binds the Christ to Adam and Eve, is painted with a solidly applied layer of red paint. In contrast to this, the halo behind Christ's head is fashioned from a piece of sheet metal that is now rusted. The massive *Crucifix*, which projects more than a foot from the wall, stands boldly against the flat, painted canvas background and creates a striking visual element on the south wall of the hall.

Towards the end of the mural project, Sargent drastically simplified his working technique. This change is especially notable in the lunettes that were affixed to the east and west walls in 1916. Here, the artist uses Lincrusta-Walton almost exclusively; Lincrusta being a commercial wall covering made of paper fiber and linseed oil. Although available in many styles for interior decoration, Sargent chose a simple corduroy-pattern that was glued and nailed to the murals and also gilt and painted. Commenting on Sargent's working practices 1916, the critic Coburn explained the reason for the use of this material. "Mr. Sargent worked daily on the scaffolding, modeling and gilding every least bit of ornament...attaching to them yards of corduroy so applied as to make the diffusion of light more interesting than from flat surfaces."[9] During the third installation phase, Sargent carefully adjusted the placement of the gilded Lincrusta elements on the canvas supports. The Lincrusta sections were temporarily fixed to the canvas support using metal tacks. The lunettes were then hoisted upwards using ropes and pulleys where the artist could judge the effect of the light as it reflected off the gilded Lincrusta surfaces and make the necessary changes in their position. Here, the Lincrusta was used not so much to create texture, but rather to produce subtle and variable reflections of the natural light from the skylights above. The degree of reflection off the gilded Lincrusta sections would thus vary according to the movement and position of the visitor below.

In addition to painting the murals and embellishing them with relief elements, during the installation phase of 1916, Sargent also assumed the responsibility of re-working and making significant alterations to the decorative features in the hall. This included changes in the lighting scheme and changes in the decorative elements that surround the murals. Until 1916, the barrel vaulted ceiling and the walls in the hall had remained simple and austere surfaces. Sargent, however, proposed a drastic re-design of these surfaces that was not called for in the original contract. After much correspondence with the architect and the library, the artist was given the latitude to carry out the major alterations he wished to make including the application of ornate, gilded bas-relief moldings and relief medallions (see the ceiling decorations in figs. 1 & 2).

Sargent's extensive and innovative use of various relief materials applied over the painted mural surfaces of the *Triumph of Religion* produced unconventional mural surfaces more akin to a mixed or multi-media decoration and clearly sets his work apart from the conventional mural painting technique of his time.

The Lighting Issue

When Sargent proposed to re-decorate the barrel vaulted ceiling with ornate bas-relief decorations in 1916 questions also arose about modifying the light in the space. It seems though, that as early as 1903, the artist was not completely satisfied with the quality of light being emitted from the skylights. Sargent would recall that, while he was installing the murals at the ends, "at a certain height, the skylights looked like two dark green patches on the ceiling, showing the color of the glass, but radiating no light. Possibly another kind of glass with cut facets would disperse the light more".[10] It is not clear if changes were ever made to the skylight glass, but during the project Sargent did make modifications to the electric lighting in the space. Since the artist's death, however, the lighting underwent two major alterations and today, few visitors to the Library realize that the present lighting arrangement in the Hall bears no resemblance to the scheme Sargent intended for the space.

Early photographic images of the space reveal how the lighting arrangements and later alterations evolved in the gallery. In 1895 the gallery was lit with natural light from the three skylights above and large, evenly spaced, commercial lamps that were part of the original building construction. During the 1916 installation, Sargent reconfigured the lighting by eliminating all but two of the original lamps and introducing six electric sconces that he designed himself (fig 3.). The fixtures were carefully arranged in concert with the natural light from the skylights to illuminate the murals in very specific ways. It has been noted that Sargent's murals were perhaps the first major decorations that considered electric lighting as part of the overall scheme. The architect Thomas Fox, Sargent's close collaborator on the project states that the artist "fully appreciated in advance the conditions of light and all other circumstances, and intended his finished work to be seen in connection with them."[11] Occasionally, Sargent's correspondence provides us with important insight regarding his concern for the display of the murals. In 1915, while making arrangements to send the third group of murals to the Library, Sargent states his reservation about their arrival in Boston long before he can come to install them and where they might be stored in the interim. Among other things he says, "I shouldn't like them to be exhibited in a Museum or an Exhibition, as the light would be entirely different from that for which they are meant."[12]

The original lighting scheme remained in place until WWII when the roof openings above the skylights were closed, apparently to stop leaks. After that, banks of florescent lights were installed just above the skylights to increase the light levels, but this imparted a gloomy effect on the space. The next major lighting change occurred during a 1953 restoration. At that time Sargent's lights were deemed inadequate and the electric glass bulbs in the wall sconces were removed and replaced with similar sized, brass balls for decorative purposes. Fortunately, the brass sconces themselves were left on the walls. The gallery was re-lit with, eight, brass bucket shaped lights installed in exactly the same location as the early commercial lamps that existed prior to Sargent's lighting scheme. The buckets now throw harsh light along surfaces that were not meant to lit and cast unwanted shadows on portions of the murals; an effect in sharp contrast to the original diffuse illumination intended by Sargent (see figs 1 & 2).

A number of letters make the reasons for the drastic 1953 lighting alteration apparent. Beginning in the 1936, complaints from the general public included comments such as "The lighting of the Sargent murals is atrocious. The lights shine in the eyes of the viewer and very poorly illuminate the paintings."[13] Expressing hope that the lighting would be improved in the near future, the Library's then Director writes a telling response. "At the time the pictures were being painted and installed, lighting developments had not proceeded to their present stage. Were the painter alive today, I think that he would probably wish to have attention given now to the lighting of the murals, which at the time he believed to be adequate, but which no longer seems so."[14] One might assume that the numerous letters concerning this matter and the subsequent redesign that transpired are simply about efforts to correct perceived poor lighting, but by this time the murals had accumulated considerable grime and dust which probably made the original lighting appear ineffective. It also is evident that just a few decades after Sargent's death his intentions for lighting the space were not understood. Promey's recent work describes Sargent's calculated lighting arrangement around the mural program.[15] One of the most important effects was to have the murals at the center of the gallery, where the narrative of the cycle was to culminate, flooded with natural light from the skylights above. At the ends of the gallery, which the artist portrayed as darker times in the history of religion, the lighting was to be much more subdued and dim. It is no coincidence that the murals at either end of the hall are painted in the darkest tones and adorned with the most elaborate gold relief elements. Ives Gammell understood the subtle optical effects that were to occur on these surfaces. In 1946, seven years before Sargent's lighting was extinguished, he remarked

that "Mr. Sargent made the lighting an integral part of his scheme. His purpose quite evidently was to add solemnity and mystery to his decoration by adjusting the lighting so that glints on the gold and the relief contributed to the effect."[16] This astute observation underscores the necessity for a full understanding of the subtle nuances and effects that Sargent was creating in the space before any restoration campaign is undertaken.

Condition of the Murals

Much of the limited amount of time that the Straus Center conservation team had in which to examine the murals was spent assessing the actual condition of the painted surfaces. In so doing, answers were sought to questions regarding what the original surface appearance was, what the nature of the soiling materials currently on the murals is, whether or not it could it be safely removed, and what course of treatment would be best at returning the murals to an aesthetically faithful state?

Upon first viewing it is readily apparent that both the subject matter and techniques employed by Sargent in these murals are quite different from those more commonly associated with his work. Of all his works, the Boston Public Library murals with their calculated use of orthodox religious imagery and iconography, are in fact the most unorthodox in regard to artist technique. With the BPL murals Sargent's creative energies seem to no longer have been focused on producing individual paintings capable of standing alone on the basis of their artistic merit, but rather on designing a complete environment in which each painting was a component part of a greater whole. Much of Sargent's aim in the BPL gallery seems to have been directed at making an experiential impact on the visitor and delivering an eloquent visual manifesto of some of the popular thinking among late 19th-century Christian Humanists.

With the exception of perhaps the *Frieze of the Prophets*, the techniques used for the murals bear little resemblance to any of Sargent's better known easel paintings. As such, the ability to place the BPL murals within a visual context of similar works by Sargent is greatly reduced and therefore makes the challenge of determining the original appearance of the paint surface all the more difficult. Perhaps the most obvious and noteworthy departure from a more traditional approach employed by Sargent involves the use of applied three dimensional objects. Along with this unusual use of materials can be found considerable deviations in the manner of paint application. In general, the murals are all rather thinly painted, but even so, great differences in regard to materials and techniques exist from one mural to the next. Evidence also suggests that different approaches to surface finish were employed on various murals within the cycle.

In the course of examining the murals some basic treatment measures were carried out including the consolidation of flaking paint and the removal of accumulated dust. The amount of accumulated dust was quite remarkable since the elevated position of the murals made it difficult for the library to carry out a regular maintenance program. This coupled with the fact that the gallery itself lacks any climate control or air filtration system partially explains the reasons for the extensive amount of loosely bound soiling material found on the surface of the murals. The relief elements found throughout the murals had become shrouded with a felt-like layer of dust. This was particularly true for the two major high-relief elements located at either end of the gallery; *Moses with the Ten Commandments* and the *Crucifix with Adam and Eve*. In these cases, the dust and particulate matter completely obscured some areas and emphasized the gallery's overall neglected state. After complete photo-documentation had been made of the murals and their surfaces carefully examined for the presence of flaking, the loosely bound soiling material was removed using soft brushes and a HEPA vacuum. This measure alone brought about a marked visual improvement to the murals.

In general, there was very little flaking paint present on the murals with the exception of two lunettes located on the upper part of the east wall entitled *The Fall of Gog and Magog* and *The Messianic Era*. A third lunette on the same wall showed no sign of flaking and an inspection of the building gave no reason to believe that the flaking was a result of moisture migrating through the walls at these particular lunettes. Close examination of the surfaces revealed that unlike any of the other murals in the gallery these two were both executed on top of previously painted designs that were compositionally similar to the finished images. The flaking occurred at the interface between the current design layers and the surface of the previously painted design. The two murals also differed from the others in regard to the somewhat thicker paint application and what appeared to be a heavier application of some sort of surface coating. Areas of flaking were first outlined with soft chalk. The flaking was later consolidated by introducing BEVA 371® under the flakes with sable brushes. This was allowed to dry and later set down with the aid of a warm tacking iron. Excess BEVA 371® on the surface was removed with cotton swabs moistened with xylenes.

Other signs of degradation noted during the coarse of the examination include localized areas of an unidentified purplish white surface haze. A few different theories were entertained as to how to account for this, including the possibility of the hazy material being residue from past cleaning materials used on the murals. Another theory maintains that the hazy material is an exudate coming from within the paint layers. Recently, published articles in the conservation field have noted this phenomenon occurring in other late 19th-century paintings and it is thought by some to be connected to additives in the formulation of cheaper quality artist oil paints available at the time. It is noteworthy that most of this haziness on the Sargent murals was in large part localized to areas of dark bluish-black paint, supporting the idea that it is related to some type of exudate specific to a particular paint. Fortunately, in the case of the Sargent murals, this hazy material was easily removed from the surface with mineral spirits.

The Cleaning Issue

Ultimately, the single most difficult treatment challenge concerning the BPL Sargent murals involves the effective and safe removal of the more tightly bound soiling material present on the surface. This is complicated not only by the nature of the soiling material, but also because the paint surfaces have incurred substantial damage from past treatments. Extensive abrasion is present on each of the murals and in many places the weave pattern of the canvas is emphasized as a result. However, some of what appears to be abrasion may be partially attributed to Sargent's technique in which a high degree of surface finish seems not to have been a primary concern. With the increased distance of the murals from the viewer, design seems to have taken precedence over detail and we are again reminded of the letter by Sargent in which he writes "I shouldn't like them (the murals) to be exhibited in a Museum or an Exhibition, as the light would be entirely different from that for which they are meant."[17] This underscores the point made earlier that Sargent's approach to painting these murals was vastly different from his other works. With this said, however, it was apparent that the surface of the murals had suffered substantially from past treatments done in 1940 and 1953. Documentation concerning what these treatments consisted of is largely non-existent. All that is presently known about the first treatment is that it happened in 1940 and that it was done under the direction of the Art Commission of the City of Boston. Documentation for the 1953 treatment is not much better. What is known is that the low bid put in by Finlayson Brothers earned them the job of "cleaning, making necessary repairs, and surfacing of the murals and six gold medallions in the Sargent Gallery."[18] All this was stipulated to take place in less than three months.

What was used for the cleaning and surfacing of the murals is not recorded, but a letter dated August 1953 from the outspoken art critic and teacher Ives Gammell suggests that the treatment was not successful. Mr. Gammell writes: "I have just visited the Sargent Gallery where I was horrified to find that substantial portions of these superb decorations have been, in my opinion, damaged beyond possibly repair:"[19] The full extent of the damage may perhaps not be apparent since they were first unveiled in 1919. However, anyone comparing their present appearance with the archival photographs available at the library can hardly fail to be shocked by the changes which have taken place in many important areas notably in three of the small lunettes which have been to all intents and purposes ruined.

Suspicions about the possible use of some sort of wax-based cleaning formulation were raised early in our recent examination. It was observed that the surfaces of the un-cleaned murals could easily take a shine when lightly buffed with a cotton ball. Cleaning tests with hydrocarbon based solvents removed substantial amounts of soiling materials, supporting the idea that a wax coating, or at least a considerable amount of wax residue, was present. The problem however was that the surface recovered after removing much of the waxy material with hydrocarbon solvents was hazy and still had a considerable amount of grime intact. Investigations into early unrelated treatment records at the Fog Art Museum as well as the Worcester Art Museum, both of which were pioneer institutions in making thorough documentation a part of any conservation treatment, suggest that the 1950's were somewhat of a heyday for wax-based cleaning systems. In fact, the Gettens Collection at the Straus Center for Conservation has samples of such wax mixtures and both the Straus and Worcester Art Museum have records of various wax-based cleaning recipes used during this time. Many of these mixtures are emulsions that feature drying oils such as linseed oil and highly alkaline material such as ammonia. Dangers inherit in the use of these kind of emulsions include elevated pH levels capable of swelling and disrupting an oil paint layer. The coating or residue of wax and drying oil left behind from such formulations also becomes a surface on which grime is easily held and sets-up a situation in which the solubility of the coating is complicated due to cross-linking of the drying oil content.

Cross-sections taken from several locations on the BPL Sargent murals proved valuable in the effort to understand the nature of the paint and associated surface materials. One such cross-section was taken from the greenish white robe of the pharaoh figure in the *Israelites Oppressed.* The surface coating appears somewhat discolored in visible

light and lacks any real auto-fluorescence in UV light; both of these characteristics are consistent with that of wax. Also visible is a substantial amount of grime in the form of particulate matter intermixed in the discolored surface coating. Overall examinations of the *Israelites Oppressed* and *the Frieze of the Prophets* murals with hand held UV lights showed a general lack of auto-fluorescence on the surface. Gas-Chromotography-Mass-Spectrometry analysis carried out by Richard Newman at the Boston MFA on surface material removed using swabs moistened with Shell Sol 340HT® revealed the presence of both beeswax and paraffin.[20]

Even in light of the increased tendency to hold onto grime that such a wax/oil surface coating emulsion has, the amount of grime present on the murals seemed quite remarkable. Certainly some of the grime now present on the murals was present before the wax emulsion treatment, but there are in fact other reasons that account for the darkened state of the murals. The burning of fossil fuels throughout the city of Boston earlier in the 20th century, particularly coal, likely accounts for much of the grime on the mural surface. It is also noteworthy that the Back Bay Train Station is only two blocks from the library. In the recent past, it was common practice for trains to clear their stacks while at the station and thus spew out incredible amounts of soot. In a letter from the Library's executive assistant dated Sept. 1949 the situation was described as follows, "Unfortunately the area in which the building is located is filled with heavy deposits of dust from the near-by railroad yards, and the need for cleaning becomes acute far more frequently than we would wish."[21]

Conversations with Joe Sarro, manager in charge of building operations who has worked at the BPL since 1953 helped to shed more light on the subject. He explained that the large windows overlooking the library courtyard in an adjoining room to Sargent Hall would often be opened wide throughout the warm months of the year and that a huge exhaust fan was located in the ceiling of another room adjoining Sargent Hall at the other end. With this set-up the courtyard area was said to function in essence as a kind of sink for heavier airborne pollutants. The soot filled air would begin to settle in the cooler air of the courtyard and then be sucked in the open windows, through Sargent Hall, and blown back out the exhaust fan at the other end. Given this arrangement and combined with the fact that a long stairwell opens into the room from below a scenario existed in which the Sargent Hall functioned in some respects much like a chimney. Presently the library still lacks an adequate HVAC system for this part of the building. The proposal that the Straus Center submitted to BPL officials concerning the future conservation treatment of the Sargent murals stresses the importance of including an adequate air filtration and climate control system as an integral part of the conservation and renovation of the gallery.

Cleaning Tests

Given the variety of contributing factors, the degree of grime build-up on the mural surfaces made sense. The extent of this grime build-up was made acutely apparent when a small gilded plaster relief element on the mural, *Israelites Oppressed*, was rotated on the axis of the single nail used to attach it to the mural surface and revealed a near pristine mural surface beneath. This original surface confirmed the degree to which the grime had built up on the murals and provided a guide for the cleaning tests. Evidence suggests that the wax emulsion treatment did not extend onto the applied pieces and therefore does not additionally complicate their cleaning. An initial series of small cleaning tests were carried out on the paint surface of *the Israelites Oppressed* and the *Frieze of the Prophets*. The location of these tests were methodically recorded using scanned digital images of the mural and these maps were in turn annotated with the observed results for each test. Information gained from these tests suggested that the use of a two-step cleaning approach held the most promise. This two-step approach employed a hydrocarbon solvent to remove a substantial amount of the waxy residue and surface grime, and after a period of drying, was followed by an aqueous based cleaning system to remove the remaining grime and reduce the hazy residue. The use of more polar organic solvents at any stage only resulted in amplifying the blanched appearance left behind.

Considerable time was spent mixing a wide range of aqueous test solutions in an attempt to determine the role of various controllable features within aqueous systems such as pH level, surfactant strength, chelators, and buffers. Each one of these was evaluated independently and later in concert with each other, in an attempt to design a cleaning system that gave optimum results in terms of grime removal without negatively effecting the paint surface below. Some initial successes were obtained using Shell Sol TS-28® as the hydrocarbon solvent followed by an aqueous system buffered to a pH of 7.5 and including 1.5% diammonium citrate and a couple drops per 100 ml de-ionized water of the non-ionic surfactant Triton XL-80N®. However, as testing continued on different mural surfaces, variations in the results also occurred. In some areas additional cleaning was considered desirable, as more tightly bound grime and some of the blanched residue of what was either the wax emulsion or a previous coating material remained behind. Modifications to this aqueous cleaning system included increasing the strength of the surfactant used. In order to avoid the use of ionic surfactants, the non-ionic Triton XL-80N® was replaced with a simple

mixture of two other non-ionic surfactants from the series of surfactants known as Pluronics®, manufactured by BASF.

Pluronics® consists of block co-polymers of ethylene oxide and propylene oxide. By varying the ratio and length of the block co-polymers the manufacturer is able to offer a variety of surfactants in a wide range of hydrophile lipophile balance numbers including HLB numbers higher than what was previously available with typical non-ionic surfactants. One of the goals in developing the cleaning mixture to be used on the Sargent murals was to employ a surfactant or surfactants that had as low an HLB number as possible and yet was still effective at removing the soiling material from the surface of the painting. In resisting the temptation to use some of the very high HLB ionic surfactants available, the cleaning could be carried out with less risk to the paint surface, while simultaneously eliminating the possibility of forming ionic complexes on the surface of the painting. Since each of the Pluronics® tested on the Sargent murals are water soluble, treated areas were rinsed with de-ionized water to remove any remaining surfactant. Rinsed areas were allowed to dry and later one over with swabs moistened in mineral spirits as an additional step to assure clearance.

The unique nature of the Pluronics® also offers some advantages in terms of what to expect if any residue of the surfactant is left behind on the surface. Since the surfactants consist simply of block co-polymers of ethylene oxide and propylene oxide, the breakdown products are essentially innocuous. The monomer units breakdown into aldehydes that volatilize off the surface. Research involving clearance issues of various non-ionic surfactants was recently carried out at the Getty Conservation Institute and in partnership with Richard Wolbers.[22] This research supports the above mentioned breakdown scheme and has also shown that the reaction is light catalyzed.

Another modification made to the aqueous cleaning system involved lowering the pH to 6.5. This was done in an effort to bring even milder conditions to the paint surface. In so doing the cleaning system could remain on the paint surface longer while simultaneously reducing the risk of affecting the breakdown of any of the free fatty acids within the oil bound paint layers. Since the surfactants are non-ionic its ability to function is not dependent on pH level. The cleaning system was also thickened with 1.5% hydroxy-propyl-methyl cellulose. By raising the viscosity of the mixture the risk of water wicking into and swelling the underlying canvas support or any water sensitive materials within the layered makeup of the painting was reduced. Increased viscosity also allowed for the mixture to be kept in place on the surface of the murals for longer periods of time. The modified cleaning system produced improved results in regards to increased grime removal, decreased haziness remaining on the surface, and a longer period of time in which to safely work on the surface. A detail from the *Frieze of Prophets* shows one of the larger cleaning windows made during the examination (see fig. 5). This was done primarily for library officials in charge of the project to serve as an example of what could be expected from cleaning.

Unfortunately, the Sargent murals present even further challenges regarding their future conservation treatment. Some murals exhibit not only an incredible amount of grime, but also pronounced abrasion in combination with what appears to be a discolored applied coating. This greatly complicates efforts to bring each mural into relative harmony with the others as the range of cleaning becomes noticeably different from one mural to the next. On some murals whole passages of glazes seemed to have been scrubbed right off. Initial theories regarding these heavily abraded areas held that they were solely the result of past treatments. However, during the course of examination additional sources of archival material surfaced, such as a cardboard box containing a wealth of early photographs of the murals. Within this box two photographs in particular would prove to be very telling. A photograph of the mural *Fall of Gog and Magog* taken in 1916 was taken before the mural was installed. In another photograph of the same mural taken the same year shortly after installation. A close comparison of the two suggests that a great deal of damage to the paint surface occurred during the installation. Also of interest is that the photograph of the mural after installation was taken before Sargent signed the mural, leading one to conclude that Sargent was aware of the damage, yet signed the mural without making any corrections.

Questions Regarding Surface Coatings

Sorting out questions concerning the presence of applied coatings on the murals is also challenging. The first set of murals installed at the North end of the gallery seemed to lack the kind of discolored coating observed on other murals particularly on the lunettes. Even within the lunettes there was considerable variation, and it is again the east wall lunettes, *Fall Gog and Magog* and *Messianic Era* which stand out. On these a brownish colored material forms a very discontinuous coating on the surfaces. Answers regarding the kind of coating(s) present on the surface and whether or not any of them are original were sought using a variety of methods.

A cross-section taken from *The Fall of Gog and Magog* helped show the layered structure and is consistent with that seen in other samples taken from murals where the same brown coating was present. Here the layers containing zinc white are clearly noticeable due to the distinct sparkling effect of the pigment when viewed under UV illumination. On top of these layers is a thin layer of red paint, likely consisting of a synthetic red pigment. The surface coatings consist of three layers. The thick discolored coating immediately on top of the red paint appears a grayish white under UV illumination. The next coating is quite a bit thinner and has a slightly different auto-fluorescence, a fine dirt layer is also discernible between the two coatings. Finally, the upper most layer lacks any distinct auto-fluorescence and is thought to be the result of the wax based cleaning material used on the surface in the 1950's. A substantial amount of dirt is also present in and on the layer.

The same cross-section when viewed under reduced magnification was stained for the presence of carbohydrates with 2,3,5-Triphenyltetrazolium Chloride (TTC). The sample exhibits a strong positive reaction in the coating directly on top of the paint surface, whereas other coatings show no reaction at all. The strong reaction for carbohydrates in this layer suggests that the coating consists largely of gums or that it contains a substantial starch component. With further cross-section analysis, a better understanding of the likely sequence of application for these coatings was pieced together. Current thinking on these coatings maintains that the gum or starch containing layer may be an original coating applied by Sargent, possibly as an overall toning layer, and that the two later coating materials were applied in past restoration attempts. Information gleaned from archival photographs along with the evidence visible in the cross-sections supports the idea that the bottom coating is original and was applied shortly after the paintings were completed. The abrasion to the paint surface was also apparent on a microscopic level, as some cross-sections showed the first two coatings worn right through to the paint layer in some places. Other samples showed how the upper paint layers and the carbohydrate containing coating are slightly intermixed in some places.

A cleaning approach similar to that tested on other murals was also tested on the lunettes with the brown coating. The approach successfully removes much of the soiling material and would only begin to remove the underlying abraded brown coating with repeated applications combined with the mechanical action of using a natural bristle brush. Unfortunately this coating appears to have discolored considerably and seems to also have grime imbedded. The effect of the coating on these two lunettes leaves behind a surface that is out of keeping with the majority of the other murals.

The murals at the South end of the gallery proved to be the most challenging of all in terms of developing an approach to treatment. The green paint in *Handmaiden of the Lord*, and the reds in the *Frieze of Angels* were both extremely sensitivity to a wide range of solvents including mineral spirits, water, and seemingly everything in between. A large part of this is likely due to the somewhat under-bound nature of the paint. The techniques used by Sargent were also rather unusual, including an economical, if not somewhat crude approach to painting the angels faces and the apparent application of paint in some areas with something more akin to a paint stick than a paint brush (see fig. 5).

Reds throughout the murals had shown a heightened sensitivity in a wide range of solvents including mineral spirits, but this was particularly true of the reds on the South end murals. The overall abrasion emphasized the canvas weave and the surface appeared very inconsistent with smooth non-saturated passages reflecting light and appearing disjointed from the surrounding matte canvas textured areas. A sample from the red robe of one of the angels was taken, which by itself was not easy an easy task as the paint layer itself would easily crumble during sampling. The cross-section helped explain some of the observations connected to the red paint. Under magnification the paint lacked a distinct layered structure and had little structural integrity. Large voids and fissures were apparent throughout the sample and the surface showed abrasion and a lack of a distinct boundary between soiling materials and paint layer. Staining with TTC also suggests that unlike other paint layers tested, this red paint contained a large carbohydrate component, perhaps a starch added as an extender to the oil paint.

The two stage cleaning approach with an initial use of hydrocarbon solvents to remove the bulk of the wax does not appear to be an option on this surface of the south end murals. Tests using just the aqueous system proved unsatisfactory as well, eventually yielding red on the swab. An emulsion designed to bring a small amount of hydrocarbon solvent to the surface within a largely aqueous mixture showed some promise although it too eventually effected the red paint. Tests carried out at the Winterthur Conservation Lab with the help of Richard Wolbers on a sample of the sensitive red paint showed that the pH of the sample itself was quite acidic. This may suggest that an emulsion consisting largely of a lower pH aqueous phase and a small hydrocarbon phase may yet prove effective at removing the soiling materials from the surface without further degrading the underlying paint layer. To date, this type of approach has yet to be tested.

Re-Saturation of Blanched Surfaces

Even if a safe approach to cleaning is possible, the larger question of what to do with the surface after cleaning must be considered. After at least two past cleaning attempts which appear to have further compromised an already fragile surface, and which included what is likely a thin resin coating in the first treatment and the apparent use of a strongly alkaline wax emulsion in another, it is unlikely that the surface recovered after cleaning will be an accurate depiction of what Sargent intended. In the case of the *Frieze of the Angels* the conservator is faced with a damned if you do, damned if you don't situation in regard to varnishing. Obvious questions include: what could be used safely on a surface that has shown to be sensitive in such a wide range of solvents and how could such a material be safely removed in the future?

The argument in favor of some type of surface coating is supported by a variety of evidence, including archival photographs such as that taken of the mural *Synagogue* taken the year it was installed. When compared to the mural's present-day condition it is clear that much has been lost in terms of original depth, clarity, and saturation. No matter how thoughtful our approach may be in cleaning, the fact remains that damage to the actual paint surface from past treatments cannot be undone by cleaning. For this reason a range of different varnish mixtures were tested on the mural *Church* in order to see if a certain degree of saturation to the paint layers could be restored without departing greatly from the overall unvarnished looked thought to be originally intended by the artist. The tests yielded some promising results both in terms of saturation and keeping the surface gloss to a minimum.

Conclusion

Given the seemingly dire convergence of the multiple problems associated with previous restoration attempts, experimental artist techniques, and a history of misguided alterations to the space itself it is easy to see how those attempting to return the Sargent murals to their originally intended appearance could be discouraged. Moreover, one could argue that the mural cycle is inherently compromised to begin with because Sargent failed to complete the mural cycle. But despite this, Sargent Hall remains an extraordinary work, both artistically and historically. There are few if any mural programs where the artist is asked to paint a major mural cycle and is then encouraged to design the surrounding decorative elements and the lighting scheme as well.

The conservation and lighting issues that lie ahead pose serious challenges to those entrusted with the care of Sargent Hall. If the history of Sargent Hall tells us anything it is that interventions, no matter how well intentioned, can have serious consequences on a work of art. It also cautions us about the tendencies of a given period to impose its aesthetic notions on an earlier one. The inappropriateness of the 1953 cleaning and re-lighting of Sargent Hall makes this painfully clear. But there is reason to be hopeful. Current renovation plans for the Library call for opening the roof over the skylights and reintroducing natural light into the gallery. It is expected that the brass bucket fixtures installed in 1953 will be removed and Sargent's original lighting scheme restored. That is not to say that some judiciously applied supplemental lighting may not be desirable. Perhaps the space could be lit in two modes, one a historically authentic rendition and the other a brighter illumination of the surfaces for study purposes. The cleaning of the murals will result in a distinct improvement in their appearance making many of the obscured features visible once more. Therefore, the restoration of the murals and redesign of the lighting scheme must be thoughtfully integrated.

The Boston Public Library has before it a momentous opportunity to return Sargent Hall as closely as possible, to its former splendor. The moment is certainly right. The renewed interest in Sargent's mural projects by a number of scholars is an important development that provides us with valuable knowledge about the artist's intentions. Sargent's conception of the murals and gallery demands that the planning and implementation of the gallery restoration be approached in a holistic and comprehensive manner. The success of the future restoration campaign will depend on the collaborative efforts of the participating architects, scholars, craftsman and conservators. As Ives Gammell, warned in 1946, "Just what should be done is a very serious problem, as it is no light thing to tamper with a major work of art."[23]

Acknowledgments

The Straus Center for Conservation would like to express its gratitude to the Boston Public Library and its staff. Special thanks go to Catherine Dibble, John Dorsey, Jody Eldridge Sinclair Hitchings, Bernard Margolis, Joe Sarro, Karen Shafts, Dana Risotti, and Eugene Zepp for their enthusiasm and support. Special thanks also to John Fox, Sally Promey and Molly Crawford Volk for sharing with us their insight and scholarly knowledge on Sargent. Thanks also to Richard Newman at the MFA Boston for his analytical work and to William Barry of the architectural

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An earlier version of this paper, which forms the basis for this paper, was presented by Gianfranco Pocobene at the symposium titled, *Public Art for Boston, John Singer Sargent's Mural Projects*, held on June 25, 1999 at the Harvard University Art Museums. The symposium was co-organized by Harvard University and the Museum of Fine Arts, Boston.

Straus Center for Conservation - Conservators on the Sargent Study
Rikke Foulke, Paintings Conservation Intern
Teri Hensick, Paintings Conservator
Philip Klausmeyer, Contract Paintings Conservator
Nancy Lloyd, Assistant Objects Conservator
Kate Olivier, Senior Conservator
Gianfranco Pocobene, Associate Paintings Conservator

Endnotes

1. Volk, "Sargent in Public" in Kilmurray and Ormond, *John Singer Sargent.*
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2. *Public Art for Boston, John Singer Sargent's Mural Projects*, Symposium held on June 25, 1999 at the Harvard University Art Museums, co-organized by Harvard University and the Museum of Fine Arts, Boston.

3. Promey, Sally M. *Painting Religion in Public: John Singer Sargent's Triumph of Religion at the Boston Public Library*. Princeton: Princeton University Press, 1999.

4. Promey, Sargent's Triumph of Religion Murals at the Boston Public Library, BPL Pamphlet, 1999.

5. Promey, Sargent's Triumph of Religion Murals at the Boston Public Library, BPL Pamphlet, 1999.

6. Promey, Sally M. "Sargent's Truncated *Triumph*: Art and Religion at the Boston Public Library, 1890-1925." *Art Bulletin* 79, no. 2, June 1997. p. 217.

7. For recent substantive scholarship on the mural program see Promey, *Painting Religion in Public: John Singer Sargent's Triumph of Religion at the Boston Public Library*, Promey, "Sargent's Truncated Triumph" in Art Bulletin and Volk, "Sargent in Public" in Kilmurray and Ormond, *John Singer Sargent.*

8. Rabbi Louis Wolsey, editorial comments, Cleveland, Dec. 5, 1919.

9. Coburn, Frederick William. "The Sargent decorations in the Boston Public Library." *American Magazine of Art* 8, no. 4 Feb. 1917. p. 130.

10. Sargent letter to Benton March 19, 1915. (Ms. Bos. Li. B18a.8).

11. Fox, Thomas, untitled manuscript, 2, Boston Atheneum, John Singer Sargent-Thomas A. Fox Papers.

12. Sargent letter to Benton, BPL, Nov. 21, 1915. (Ms. Bos. Li. B18a.8).

13. G.E Davis writes on a visitor suggestion card to BPL, September. 4, 1936. (Ms. Bos. Li. B18h).

14. BPL Director letter to Mr. G.E. Davis dated September. 11, 1936. (Ms. Bos. Li. B18h).

15. Promey, *Painting Religion in Public: John Singer Sargent's Triumph of Religion at the Boston Public Library.*

16. Gammell letter to Milton Lord, BPL dated June 20, 1946. (Ms. Bos. Li. B18h).

17. Sargent letter to Benton, BPL, Nov. 21, 1915. (Ms. Bos. Li. B18a.8).

18. Contract dated May 19, 1953 between the City of Boston and Finlayson Brothers, Boston, p. 6-7.

19. Gammell letter to Mayor Hynes dated August 11, 1953. (Ms. Bos. Li. B18a.4). His opinions about the treatment, no less vehement than the letter, were published years later in "A Masterpiece Dishonored", *Classical America*.

20. GC/MS analyses were carried out by Richard Newman, Research Scientist, Museum of Fine Arts, Boston on a Hewlett Packard 5890 Capillary GC with and Attached HP 5971A mass selective detector. The coating was found to contain wax, most likely beeswax and a hydrocarbon wax. Oil may also be present (MFA Boston Analytical Report, February 24, 1999).

21. Russell Scully letter dated Sept, 14, 1949. (Ms. Bos. Li. B18h).

22. Stulik, D., Dorge V., Khanjian H., Khandekar N., de Tagle A., Miller D., Wolbers R. and Carlson J. Surface Cleaning: Quantitative Study of Gel Residue on Cleaned Paint Surfaces. IIC 18th International Congress, Tradition and Innovation: Advances in Conservation, Melbourne, Australia, October 10-14, 2000

23. Gammell letter to Milton Lord, BPL dated June 20, 1946. (Ms. Bos. Li. B18h).

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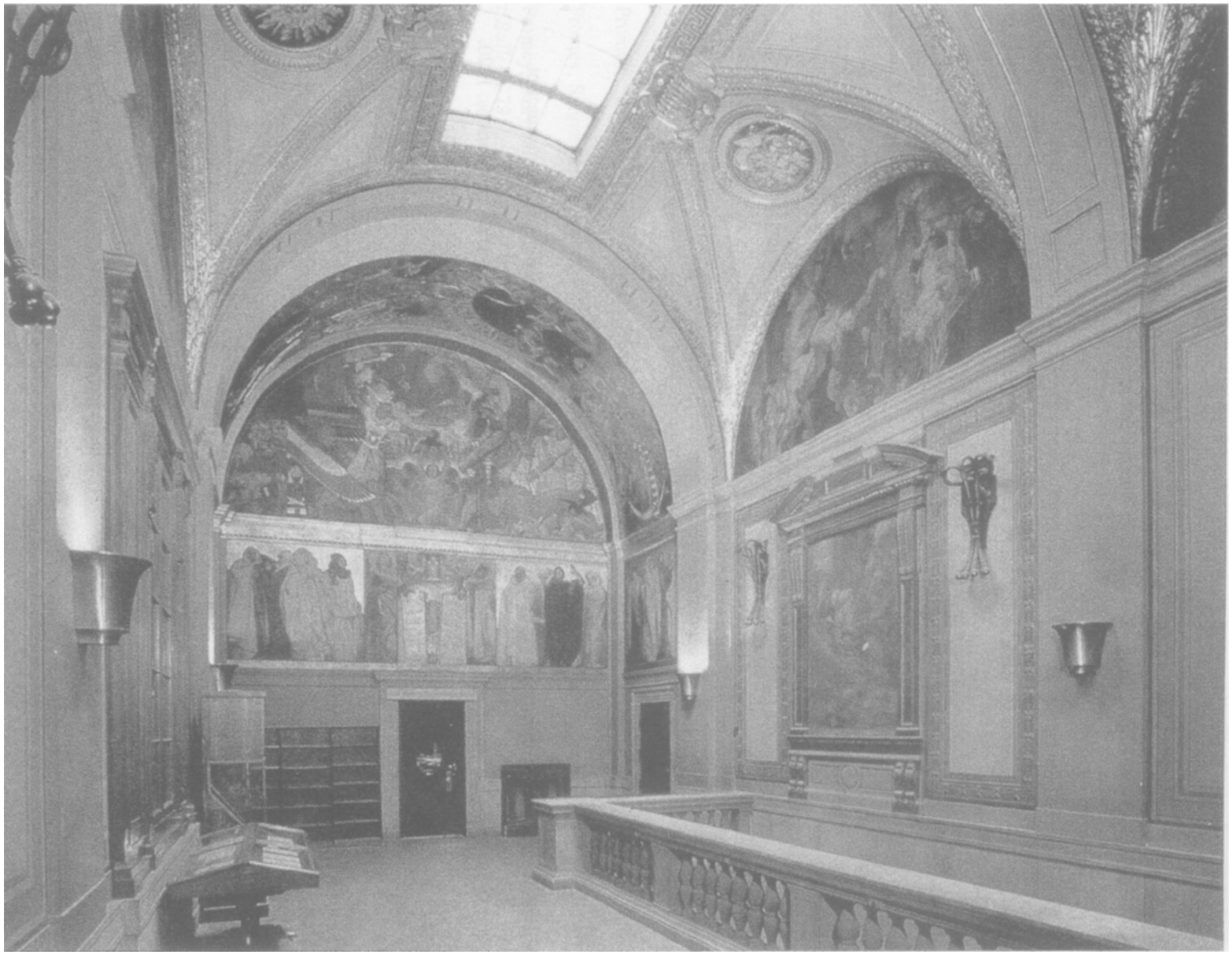

Figure 1. Boston Public Library, Sargent Hall looking north, 1999.

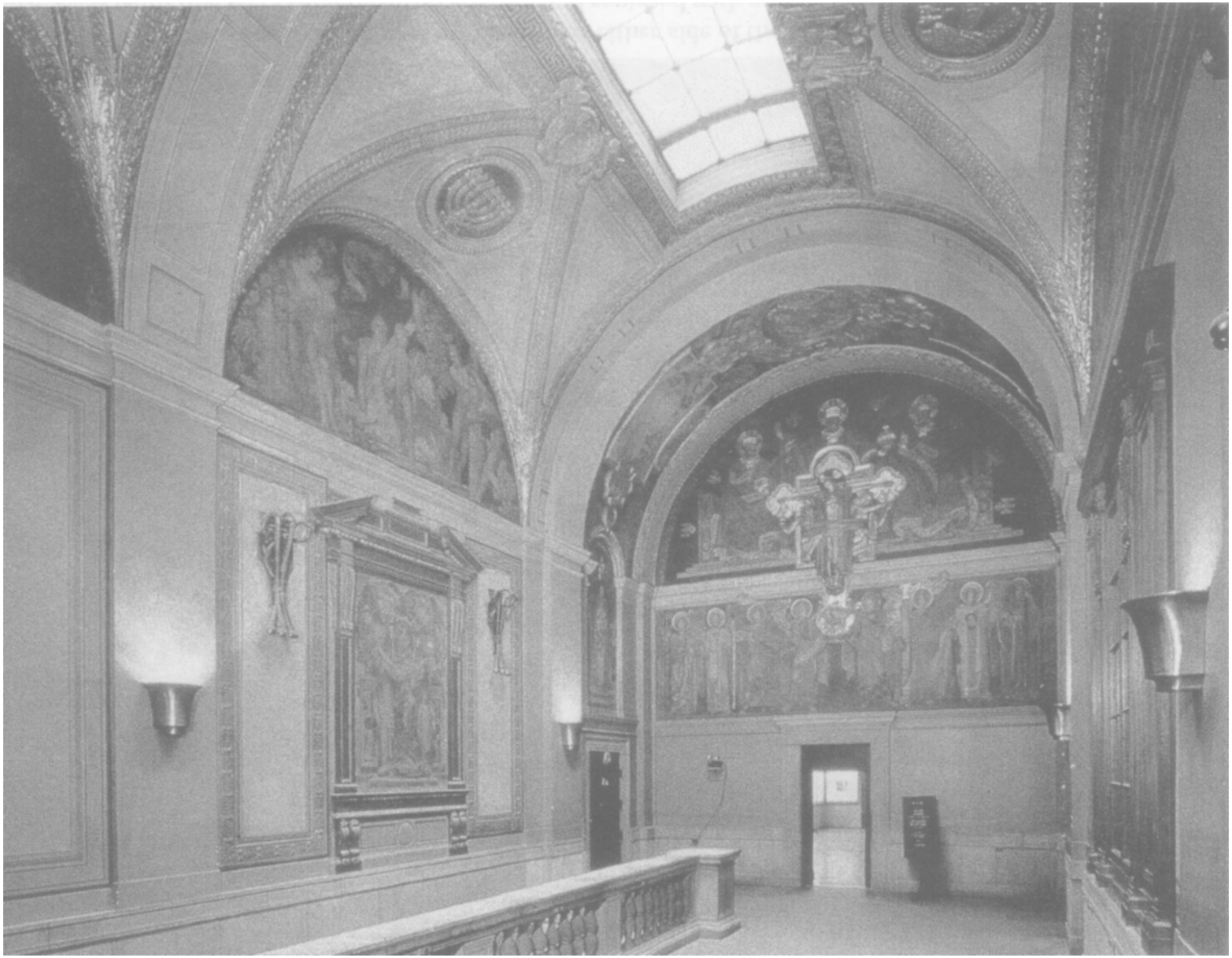

Figure 2. Boston Public Library, Sargent Hall looking south, 1999.

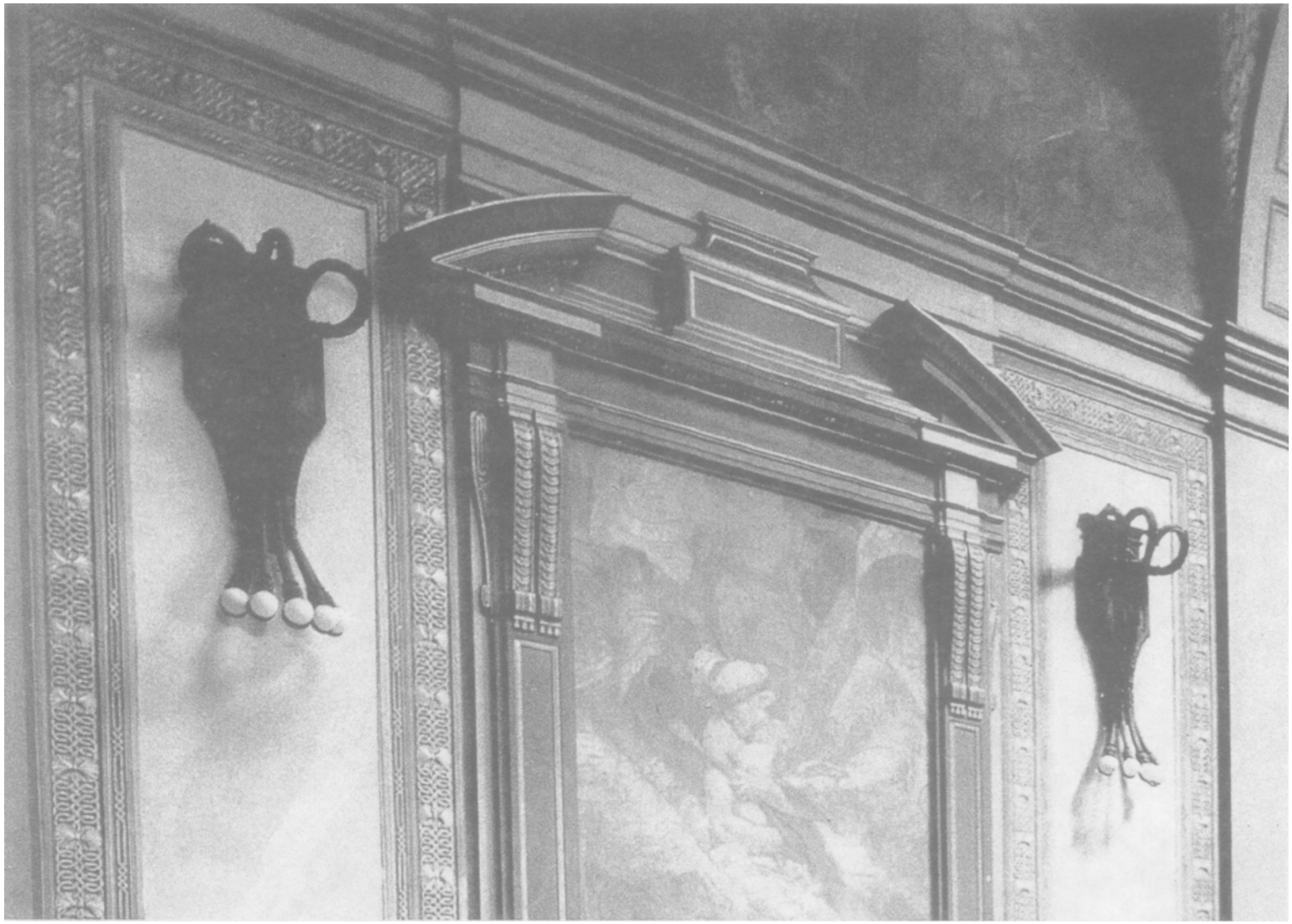

Figure 3. Detail of brass sconces designed by Sargent on either side of the *Synagogue* mural, circa 1919. Note the electric glass bulbs that were subsequently removed and replaced with non-functioning brass bulbs during the 1953 restoration.

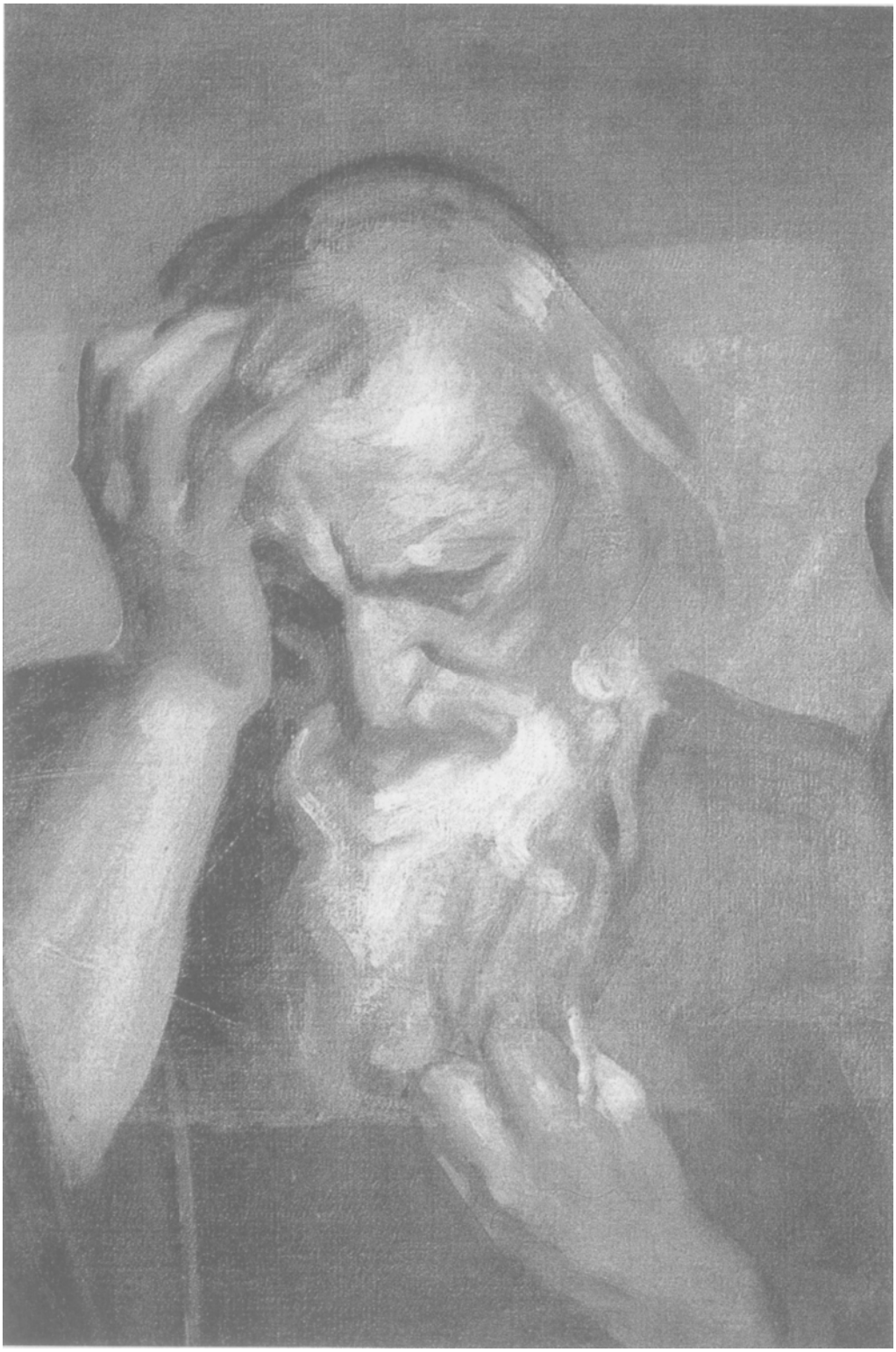

Figure 4. Detail from the *Frieze of the Prophets* showing a 1' x 1' cleaning test performed during 1999 study.

Figure 5. Detail of the *Frieze of Angels* illustrating the thinly painted surface and the abrasion of paint above the angel's head from previous restorations.

THE CONSERVATION AND TECHNICAL STUDY OF *HERCULES* BY PIERO DELLA FRANCESCA

Elizabeth Leto Fulton, Assistant Conservator of Paintings*

Introduction

I would like to share with you today a recent treatment completed in October of 1999 on one of the most cherished masterpieces from the Isabella Stewart Gardner Museum in Boston, the *Hercules* Fresco by Piero della Francesca. This painting is the only fresco by Piero della Francesca in the United States, and it measures approximately 59 1/2" (151cm) x 49 1/2" (126cm)(Fig. 1). Painted in 1465, it is reported to come from the wall of the artist's residence, which is now the Casa Graziani in San Sepolcro, Italy in the region of Tuscany. The painting was executed in the true fresco technique, that is, painted onto a preparation of wet lime plaster with possible organic binder additions applied *a secco* .

In order to give the painting a proper treatment in the 1990's it was necessary to consult fresco specialists in Italy, since not many painting conservators have experience in working on true frescoes with any regularity in the United States. Thanks to a matching grant from the Institute of Museum and Library Services (IMLS), the Gardner was able to bring in Andrea Rothe, Senior Conservator for Special Projects at the Getty Museum, who helped us find Giovanni Cabras a specialist/consultant from Florence who was available to head the project. Giovanni has had over 35 years of extensive work experience on most early Italian Renaissance masters from Tuscany.

Giovanni Cabras came to Boston for 5 weeks with intermittent visits by Andrea Rothe for a true collaboration in the treatment of the painting among Gardner, the Getty and Giovanni Cabras. The frescoes at the Gardner Museum were not new to Giovanni and Andrea, since they had both come for a one-week survey of the Gardner's collection of six true frescoes in September of 1996. Therefore, Giovanni had already made a proposal and estimate for the conservation of the *Hercules* fresco.

Background and History

According to the records, before the Gardner acquired the painting in 1906 from Elia Volpi the notable Italian antiquarian, collector and restorer, the painting had been possibly white-washed, uncovered and detached from the original wall onto which it was painted in the 1860s. It was also reported as hanging in an area at some point directly over a fireplace. As seen in the fresco, the architectural elements in the painting are rendered in perspective to be viewed from a low vantage point, to correlate with the actual architecture in the room where it was originally situated. This is clearly seen in the corbels supporting the beams in the ceiling, much like what was typically found in 15th century Tuscan rooms.

When the painting was removed from its original site in the 1860s, it suffered much damage during a stacco method of detachment whereby the painting along with part of the original wall support were removed. The combination of extensive cracking from the stacco and a blanching effect on the surface (which were

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possibly residues from the white-washing and old fills) left the painting in an aesthetically compromised state. However, the painting was structurally sound and was safely attached during an old restoration to a secondary support of new plaster (calcium caseinate based) reinforced with a metal screen and attached to a wooden frame. A grid of wooden slats were connected to the wooden frame and attached to the back of the new plaster like a cradle. Within each individual cell that the slats created, a piece of canvas was attached with shellac. It remains soundly on this attachment to this day.

Without getting too much into the history of the past restorations of which we have little information, I would like to highlight the well-documented treatment of 1979, which included campaigns of extensive overfills, overpaint, and a varnish application all which, for good intentions, were an attempt to reduce pin-point losses, to even out an uneven, disleveled plaster surface, and to mitigate a pervasive blanching problem. Giovanni explained that pin-point losses are common to fresco deterioration. This type of loss comes from sulfation when sulfur-containing components present in industrially polluted air or already present in the wall as soluble salts contamination, infiltrate the fresco and convert the calcium carbonate of the original fresco support into calcium sulfate, thereby occupying more volume. As the volume increases from within the support, the pigmented area of the fresco gets pushed up and pops off the fresco, leaving crater-like losses throughout the surface like those seen on the *Hercules*.

The next most pervasive problem was the uneven irregular surface caused by the stacco which is clearly recognizable in raking and specular lights. The overfills were made to even out the disleveled steps and consequently some of them covered the surrounding original painting.

The final and larger issue discussed here is the varnish and overpaint removal, which according to records, the painting had never been varnished before the treatment of 1979. The PVA-ayab varnish was spray-applied mostly to saturate the blanching problem of possible whitewash residues or from fills to even out a visually disrupted and broken plaster surface. But in fact the varnish made the uneveness more obvious in certain light by making the painting glossy and reflective of the dislevels when viewed at various angles. In addition the varnish saturated and thereby altered the pastel-look of the original fresco colors.

Treatment

The painting was brought into the Conservation lab where all of the work took place including extensive photodocumentation. Weighing more than 250 lbs, it was removed from a wall in the Early Italian Room with the assistance of a jack. The first task of our treatment consisted of removing the old varnish layer, discolored reconstructions and retouching. These additions had deadened the fresh light pastel look for which true fresco painting is admired. What was revealed of the original below this overpaint were cooler flesh tones which were filled with light. This point is well illustrated in this detail of Hercules' proper right leg where one can see a light pink flesh tone under the heavier beige overpaint (Fig. 2).

The PVA varnish and overpaint were very easily removeable with the commercial gel solvent mixture Zip-Strip® with no damage to the original colors. Other organic solvents, even in gel form, did not dissove the PVA retouching and varnish as quickly and as cleanly. Giovanni felt it was important not to linger during this process and by using Zip-Strip®, being a gel, it kept the solvents on the surface reducing the amount of varnish residues from penetrating into the porous fresco. The Zip-Strip® was applied in approximately 8" squares with a brush and was allowed to sit briefly (for about 3-5 mins.) on the coatings, and then the dissolved varnish and overpaint were manipulated with a brush. The area was then cleared with Shell Cyclosol 100 using a dampened cotton wad (See Fig. 3 for an overall view of the painting during cleaning with uncleaned areas marked in calcium carbonate for photographic purposes).

The entire painting was cleaned with this method followed by an overall wipe with a cotton wad dampened with acetone, picking up any residues that other solvents may have left behind. Large areas of total reconstruction of paint losses covering an approximately 4" band along the top and bottom were removed. The bottom right corner of the painting had two different campaigns of overpaint of which we have no records. The upper more heavily painted campaign labeled #3 was removed with a direct application of a saturated solution of ammonium carbonate and cleared with deionized water. The second layer of overpaint, labeled #2, was left alone, since its tonality was close to what was wanted as a final retouching color, closely matching the original, which is labeled #1 (Fig.4).

Once this operation was completed, the entire painting was sponged down overall with deionized water. Once the painting was cleaned with these methods, the painting needed the overall tonality to be harmonized and the cleaning to be fine tuned. This included evening out the blanching and the old, yellowed treatment residues from the past. Given one of the known locations of the painting, above a chimney, the brownish-yellow residue possibly came from burning wood. This imparted to the painting an uneven blotchiness, particularly apparent in the lighter lateral areas, and it needed to be reduced where safely possible.

In the selective cleaning of the light lateral areas, Giovanni applied poultices of Japanese tissue through which a super saturated solution of ammonium carbonate was applied. The tissue acted as a retardant for evaporation, thereby increasing solvent action while serving as a place onto which the residues could collect. Tests were made in the dark areas where the residues collected onto the Japanese tissue. After testing, it was decided that ammonium carbonate poultices would not be used in other areas because the blotchiness was less apparent in the dark colors. In addition, because of Piero's working methods and materials, which is explained in the "Technique" section of this talk, Giovanni did not want to potentially risk undermining a possible organic binder that Piero may have used in certain colors. Once the poulticing was completed, the painting was then sponged down with clean deionized water.

Once the varnish, overpaint and some residues were removed, we needed to reduce, and in some cases, remove the overfills. The old fills to be removed came from many campaigns of past restorations made from a variety of materials. In the treatment of 1979, the larger holes in the painting in the area of the abdomen had been isolated with PVA and then filled with the commercial preparation Plastic Wood® (which is nitrocellulose-based with sawdust), another layer of PVA and a final layer of a gesso made from kaolin and rabbit skin glue. Shallower losses of the support were filled with an isolating layer of PVA and the rabbit skin glue/kaolin mixture. However, when either of the two above mentioned systems could not be used alone successfully, an additional layer of wax was added to them.

In our conservation treatment, the overfills were reduced in the perimeter in order to recuperate more of the original painting below, or in some cases completely removed by mechanical excavation. The fills whose surfaces and materials were still aesthetically compatible with the original surface were left alone. The fills that were not compatible were reduced with a light moisture application and cotton swabs and then slowly carved down to the surface of the original with a scalpel. Given our choice of an aqueous-based inpainting medium, the wax fills needed to be removed completely with xylenes. Finally the fills that were no longer structurally stable and crumbling were carved down or completely excavated to be filled with a new fill material.

Before the losses were filled, the painting was consolidated with a brush application in more porous areas of the remaining fills with approximately a 12% Rhoplex®AC-33Acrylic Adhesive in water and cleared with water. In addition a dilute solution of Rhoplex® mixed with Jade® 403 PVA and calcium carbonate was injected in certain areas, to fill out and reinforce voids below the surface of the original thin intonaco layer (which is only 2 to 3 mm thick).

The new fill material consisted of a substance that Giovanni brought from Italy which we referred to as "intonaco dust". This pulverized material is the finely sieved remains of original dried limeplaster (intonaco) from old *stacchi* done by Italian conservators when frescoes were removed from their original walls. The intonaco dust was mixed with 40% Jade 403 in water with an addition of calcium carbonate to adjust the fineness or coarseness of the fill material to match the original texture of the intonaco in the painting.

The final process in the treatment was compensation of losses by retouching. Giovanni chose a retouching method of a modified tratteggio technique. The method included a light cross-hatching or dotting in of a translucent paint to slowly integrate the whiteness of the fill into the picture, however, always keeping the hand of the conservator distinguishable from that of the artist. In executing this type of retouching, one initially needs to carefully close up the losses by lowering the overall tone of the fill, using neutral grays and beiges rather than color matching. Color is then eventually added in a very thin, dilute concentration of the German commercial paint Plaka®, a casein-based water-soluble paint to match the surrounding areas. Despite the reputation of casein-based paints as being irreversible, Giovanni, as well as other Italian conservators of frescoes, feel that Plaka® used in very dilute concentrations can be easily removed, and its body and sheen as a paint medium is more aethetically compatible to the surface of a fresco than any other inpainting medium.

Application of Plaka® is like working with watercolors: one uses the lights of the intonaco fills for the lights and only when there are small dark areas of non-original paint to cover, is white added to the palette for the needed opacity. Like the earth colors of the fresco palette, the color selection used for the inpainting process is very limited to achieve a variety of tones and colors, but the inpainting color always remains slighly less bright and less glossy than the original colors.

When this method is executed correctly, it allows the original colors to be the protagonist and the areas of retouching will remain alive, but not heavy. The retouching will be "filled with air and light" as Giovanni stated it, which is no easy task. This method is very easily reversible with a water-dampened swab if the conservator goes too far (ie too bright in color), and if the retouching becomes too dark it can easily be lightened.

Technique

The last aspect of this project I wanted to describe is how important the cleaning and conservation of this painting was for helping us understand the artist's working technique by allowing us to read the details more fully. The Hercules fresco is executed in four *giornate* as seen by the diagram derived from a drawing by Andrea Rothe (see Fig. 5). The two lateral columns were executed in one *giornata*. In the second *giornata*, the head is executed, in the third the body, and in the fourth the legs. In raking light the *giornate* are easily recognizable by the different levels of the applications of the intonaco. In areas that did not follow the outline of the figure, a flattening made with a trowel was noticed at the seams, with the intention of hiding the two different levels of the intonaci.

Architectural outlines were delineated with use of indirect incisions drawn with a sharp instrument through a life-size cartoon leaving a soft furrow in the intonaco for the recto-linear elements in the architecture. More obvious was the use of another method of cartoon transfer. This was the pouncing (*spolvero*) method, which was very distinct as it appears on the proper right side of Hercules' body. The pouncing was easily located throughout the contours of Hercules' body as well as in the major folds of clothing. In some areas, as illustrated in the hand, the pouncing appears as white depressions in the intonaco. These impressions indicate that the life-size cartoon was perforated *after* it was applied to the soft intonaco, and then pounced with a sachet of pigment, as it was usually done.

In referring to the painting technique, Giovanni stated that the *Hercules* is one of the best preserved examples of Piero's technique that he has ever seen. Giovanni has seen many Piero della Francesca frescoes in his career, and has worked on the initial examination for the preparation of the restoration of the *Legend of the True Cross* in the Basilica of San Francesco in Arezzo with Leonetto Tintori. Giovanni was able to draw parallels in the working technique Piero used in the *True Cross* cycle well illustrated in a scene from *The Veneration of the Cross* and also seen in the *Hercules*. He said that one of the parallel aspects included the use of the same type of fine intonaco making up the light background and largely responsible for the luminosity of the colors.

Piero's basic painting methods in the *Hercules* began with large fields of color lay-ins as abstract "inlays" of shape which were unmodelled. Then the modelling would begin in thin, subtle brushstrokes of color in a tratteggio-like manner. Undoubtedly this method was borrowed from panel painting technique, already a strong painting tradition well-established in Italy for 150 years before Piero painted the *Hercules*. The delicate brushwork in a tratteggio manner found throughout the skin tones are a testimony to Piero's bravura in rendering such fine details which have remained virtually intact for over five hundred years, especially apparent in Hercules' face (Fig. 6). Broad brushstrokes of color and thin, semi-transparent veils of light color were also used in modelling. Most of the painting was executed in transluscent paints, always relying on the reflective intonaco support for the luminosity of the colors. Opaque white paints or those which were mixed with white were rarely used, only in the highlights,or in the browns of the lion skin and hair. And in some areas very definitive calligraphic strokes were found in the figures of the *True Cross* as in the *Hercules*. This expertise is no where else better illustrated than in the hair and eyebrows of *Hercules*.

One of the most intriguing questions that remain about Piero's technique was the possible use of an organic binder in some of the colors of the painting. It has already been established in the treatment and research of the *Legend of the True Cross* under the direction of Leonetto Tintori, that "organic" binders were used in certain colors, but the data remains unpublished. In the *Hercules*, a dark gray color found in the background and in the palmate motifs fluoresces a bright orange color as seen in an ultraviolet produced visible fluorescence photograph. The question as to what is fluorescing in the paint remains to be answered as we are exploring this question with Richard Newman and Michelle Derrick at the Museum of Fine Arts Boston. As it currently stands, the results from Richard Newman confirms the use of a glue in the painting, in fluorescing and non-fluorescing colors, although it is unclear whether the source of the glue is from the original materials or from later restorations. In addition, the presence of lead has been confirmed which is found in all of the samples of the fluorescing areas and almost none of the non-fluorescing areas. The presence of lead suggests the use of *secco* applications using a binder since lead containing pigments cannot be used in fresco painting. Therefore, the lead could be possibly reacting with an organic binder producing the strange orange fluorescence.

Still unexplained is the ubiquitous presence of oxalate salts found throughout the surface of the fresco, in fluorescing and non-fluorescing areas. Therefore, there is also the possiblity that there is an interaction between the oxalates and the *secco* passages resulting in the fluorescence. If this is the case, it is not clear whether the interaction involves lead white pigment, the organic binding medium of the secco passages, or both. We are also awaiting a response from the Soprintendenza of Arezzo regarding their analytical results of the painting materials from the *Legend of the True Cross* which could shed light on our fluorescence. If anyone has any ideas as to what is fluorescing in this gray paint we would like to hear form you.

Conclusion

Needless to say it has been a wonderful project, and truely a great collaboration. Working with a master conservator such as Giovanni Cabras was an incredibly rewarding and enriching experience. And more importantly, a very humbling one. Although the treatment methods and materials he chose were sometimes unorthodox to those we use in North America, more crucial was his approach in using them. Giovanni worked very cautiously in the intial stages to map out his territory, testing areas for their reactions to the materials used as a conscientious conservator would normally do. But once he was sure of where he was going, he worked with lightening speed with confidence that only 35 years of experience could give, completing the project in only 5 weeks. He worked very intuitively, like a master would, bypassing overintellectualizing and overcalculating. And ultimately he remained incredibly modest throughout the whole process, always expressing his reverance for the genius of this great renaissance innovator and master, Piero della Francesca.

Acknowledgements

I want to express my gratitude to everyone who has made this project happen: to Giovanni Cabras and Andrea Rothe for his input in the treatment, his sage advice on the Gardner's collection of Italian paintings and his assistance in helping us find Giovanni Cabras. Many heart-felt thanks to Barbara Mangum, our former Chief Conservator without whose vision and grant-writing abilities, and to the Institute of Museum and Library Services without whose funding, this project would never have happened. I would also like to thank Richard Newman and Michele Derrick, Conservation Scientists at the Museum of Fine Arts, Boston for their analytical insights. Finally to my colleagues in the conservation department at the Isabella Stewart Gardner Museum for their support and interest in the project and their suggestions for this talk.

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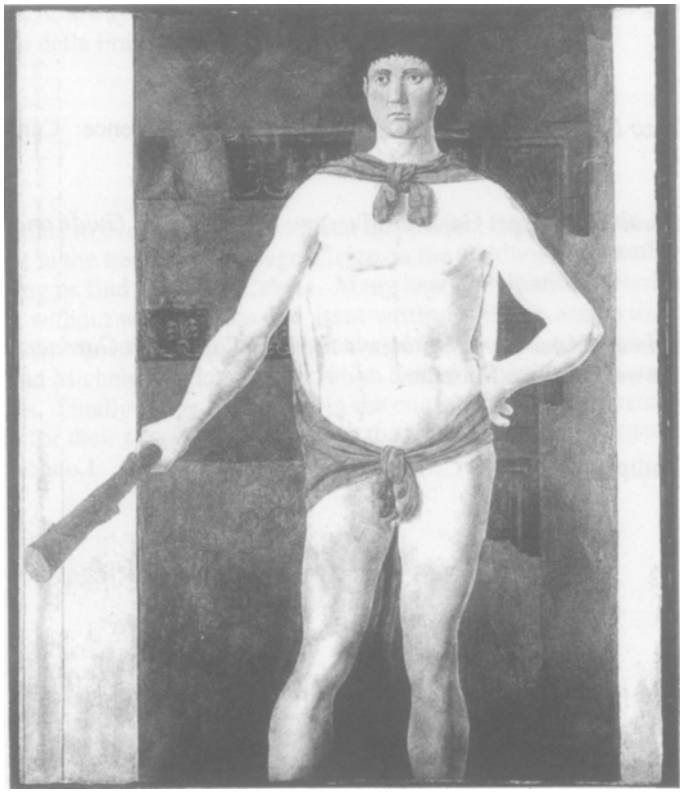


Fig. 1

Fig. 2

Fig. 3

Fig. 4

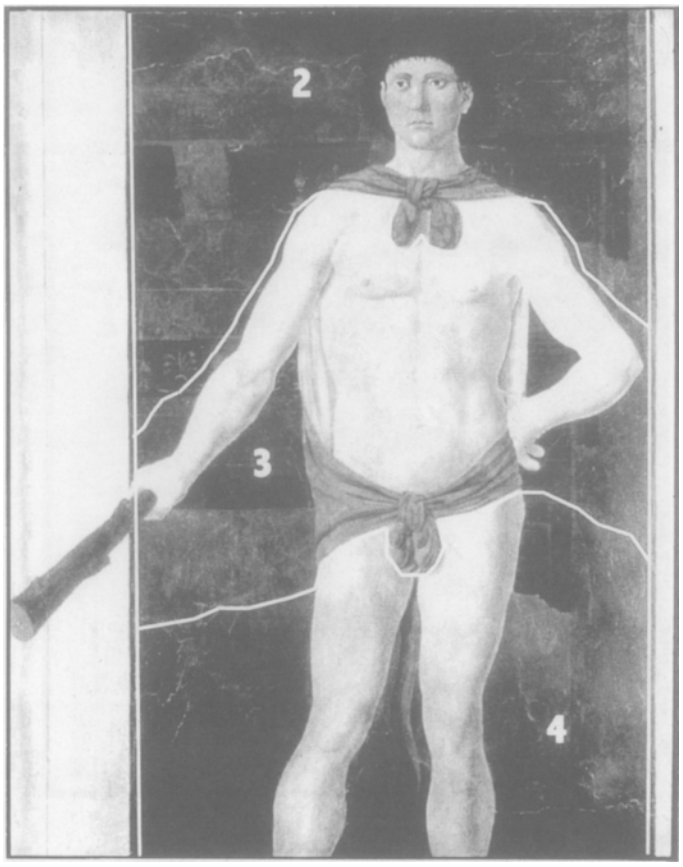
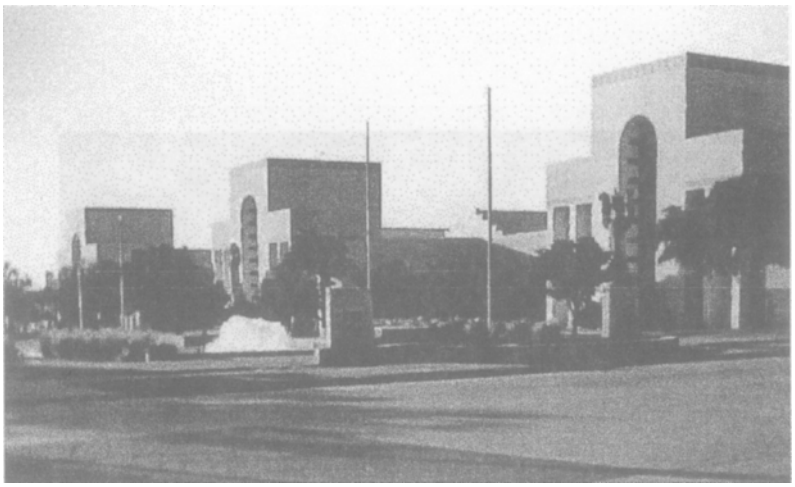


Fig. 5

Fig. 6

THE FAIR PARK MURAL CONSERVATION PROJECT

Scott M. Haskins, Conservator of Fine Art



Introduction and Historical Background

Described as one of the "finest collections of Art Deco buildings in the country", Fair Park is a product of the 1936 Texas Centennial Celebration. Fair Park represents the epitome of collaborative public art that combined the talents of architects, artists and craftsmen. It is a unique complex of architecture, monumental sculpture and mural paintings. Fair Park has established itself in a long history of other great expositions of the 1930's still in existence. Its addition to the National Register of Historic Places within the last ten years ranks Fair Park along with the "Alamo" and the "State Capitol" as one of the more significant cultural and historical sites in the State of Texas.

The massive geometric forms of the murals painted by Carlo Ciampaglia in 1936 dominate the walls beneath the porticoes of the Centennial Building and the Food and Fiber Building. They provide a colorful counterpoint to the adjacent terracotta walls of the building, drawing the spectator into its more intimate space. The murals of the Centennial Building depict the State's history as well as its natural and industrial resources. Stylistically they represent a blend of "classical, Art Deco and traditional Texas motifs."

On the Centennial Building are located 11 different paintings. Their titles are:

1. Motion, 31.5' x 14' approx.
2. Traction, 31.5' x 30' approx.
3. Railroad Transportation, 31.5' x 24' approx.
4. Navigation ,31.5' x 24' approx.
5. Future Transportation ,31.5' x 24' (not included in this project)
6. Old Methods of Transportation, 31.5' x 24' approx.
7. Aeroplane Transportation, 31.5' x 24' approx.
8. Automotive Transportation, 31.5' x 24' approx.

This presentation is an introduction to the project, which is underway as of the date of this conference. Most of the information contained herein is preliminary in nature.

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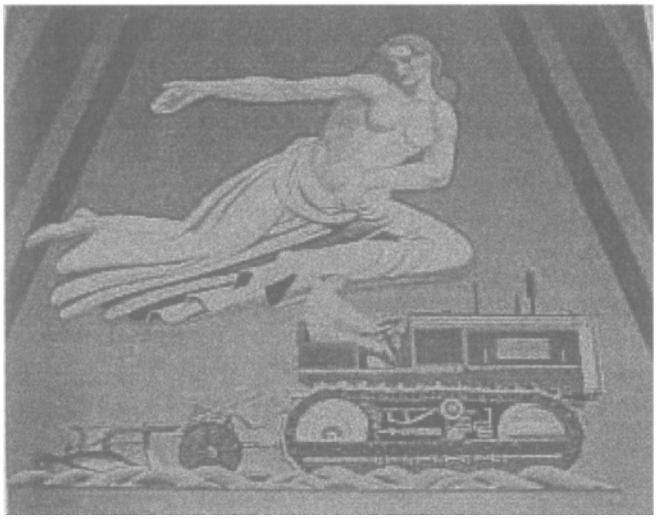
Three medallions are painted on the exterior wall surfaces beneath the three South facing porticoes which represent

1. Spain 10' dia. approx.
2. Confederacy 10' dia. approx.
3. Texas 10' dia. approx.



Traction (Centennial Bldg.) - left and Fecundity (Food and Fiber Bldg.) - right. 1936 photos from archives

Opposite the Centennial Building across the Esplanade stands another building, the Automobile Building, mirror images of each other's architecture. The Automobile Building originally had murals painted by another artist under its porticos also. Contemporary newspaper articles describe both sets of murals as being painted in "full rich colors that are associated with Italian art". Unfortunately the murals were lost when a fire destroyed the building in 1942. It may have been at the time of the reconstruction of this building that the murals on the Centennial Building were painted out so that the two buildings would maintain their mirror image effect.

Another four murals are included in this project and are located on the Food and Fiber Building.

1. Fecundity located at the West Porch, 31.5' x 14' approx.
2. Wheat Harvester located at the West Porch, 31.5' x 45' approx.
3. Pollination of Nature located at the east end of the building, 8' x 12' approx.
4. A lunette mural of a stack of wheat with a cycle and scythe located in same porch as Pollination of Nature. 8' x 12' approx.

Over the past fifty years, the murals were concealed by 6-8 layers of overpaint. They were thought to have been lost until sandblasting of a section of the Centennial building's exterior revealed a portion of "Motion" early in the 1980's.

Other murals by Ciampaglia and murals by other artists are present on the property, but are not included in this project.

About the Artist

Born in Italy in 1891, Carlo Ciampaglia came to the United States as a child. Intensely interested in art, many took notice of his young talents. This lead him, eventually, to the opportunity to study drawing at Cooper Union and painting at the National Academy of Design in New York. Interested in his heritage and wanting to see and learn from the masters, Ciampaglia went to Rome to study in his late 20's. In 1920, while a student in the Italian capital, Ciampaglia won the Prix de Rome which accorded him the chance to study at the American Academy in Rome

(with fellow-student George Dahl). This prestigious award provided the support and opportunity to absorb the influence of his native land. During this exciting period of study and intense focus, Ciampaglia was recognized for his talents of applying his knowledge and interest in the old masters to the development of his talents in the modern style of painting, which was so prevalent in Italy (Modernism).

Ciampaglia's first commission after his return to the United States in 1933 was the decoration of a home for Frank Potter in New York. This was followed by other rather diverse design jobs such as the tile decoration of a swimming pool for a hotel in Philadelphia, the mosaic decorations for the chapel of a Mausoleum in Newark, the sketches and color schemes for the Masonic Temple in Scranton, and the painted decorations in the vestibule of the New York home of David Milton, son-in-law of John D. Rockefeller, Jr. His decorative skills were evidently highly regarded, as he was elected an associate member of the National Academy of Design. Ciampaglia maintained studios in New York and at his country estate "Woodpecker Point," Middle Valley, New Jersey. In 1935, just two years after his return from Italy, he was asked by George Dahl to undertake the Centennial Mural Commission at Fair Park in Dallas, Texas. Ciampaglia arrived in Dallas in February of 1936.

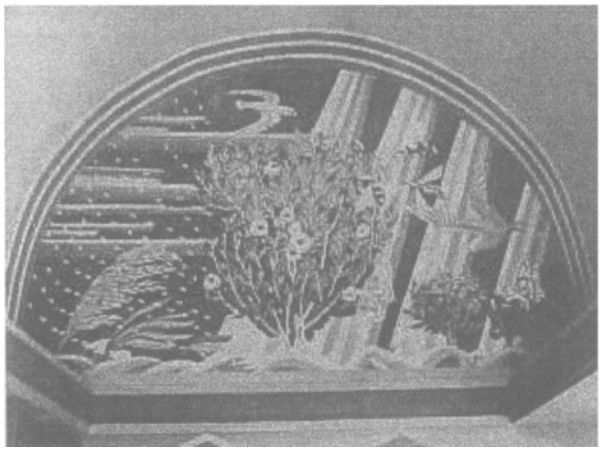
Regarding his progress on the project these few details retrieved from the Archives are interesting:

Telegram: 17 Feb. 1936
"Each one of the subjects has been monumental in character and has had to be developed under the most adverse conditions and under a continuous strain because of the shortness of time. In addition, you have executed 25 or 30 small decorative features, decorative touches and wall ornamentations."

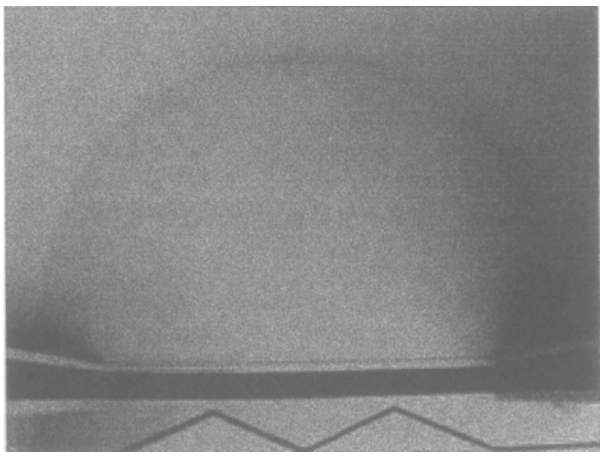
"I have appreciated immensely the splendid spirit of coop and loyalty you have shown. You have had the happy faculty of inspiring your staff and co-workers with a desire to do a splendid job."

Letter - 28 July 1936 George Dahl to Carlo Ciampaglia
"Doodles Bug asks about you a lot. Calls you Ciampaglia – you made such an impressions on her. Murals are standing up in fine shape, everyone's in love with them and I know that you have left your imprint on the community, and that they will be appreciated and enjoyed for many years to come."

Letter – 26 August 1936 Harry Olmsted to Carlo Ciampaglia
"Re: all the expo has to sell is education and entertainment. Expo owes money to you and others that it cannot pay at this time."



The Pollination of Nature from a 1936 photo



The Pollination of Nature as it appears today

Synopsis of This Project
This project provides the conservation work required on 14 murals by Carlo Ciampaglia painted in 1936 totaling approximately 7500 sq. ft. These murals are located on the Centennial Building and the Food and Fiber Building. On site conservation work began in January 2000 and may be concluded by December 2000.

Painting Techniques and Materials
The exterior terracotta block walls are covered with a 1 ½" layer of Portland Cement. This surface was sealed with a layer of glue sizing. A layer of white lead oil-priming was applied. The initial drawings outlined compositional features in burnt sienna colored underdrawing and in charcoal. The paintings were executed with an oil-like medium paint. One to three coats of oil paint were employed. Several pentimenti have been identified, some covering large areas. Over the completed paintings, a final natural resin varnish was applied to the surface.

The murals have been reviewed and inspected by many conservators over the years. Reports have been accumulated from Linda Merk, Connie Silver, Staska Star, Helen Houp and Greg Thomas, at the direction of Perry Huston of Perry Huston and Associates, Inc.

Condition:
Cross section samples were analyzed by Richard Wolbers. From his report:
"The somewhat impermeable, embrittled white lead ground layer exerts tension on the inherently weaker hygroscopic glue size layer. This has contributed to the weakened bond between the paint and ground layers from the wall leading to eventual paint loss. From the cross section analysis, it appears that some restorations were made to the murals prior to the first overpaint application. This finding substantiates early reports of attempts to consolidate insecurities in the mural soon after it was completed. The painting was subsequently overpainted entirely with an oil paint which is extremely cross-linked and difficult to remove. A synthetic resin type of coating was applied selectively to this first coating. One to three coats of latex overpaint was subsequently applied. Evidence of a clear synthetic resin coating was found to be applied between the multiple overpaint layers." Wolbers concludes that the tension exerted by the multiple layers of overpaint is resulting in shearing of the overpaint from the mural's surface.

Janet Hessling revealing the face of Mercury on Old Methods of Transportation

The majority of the surface of the murals lie under 6 to 8 layers of overpaint. Many areas are characterized by active cleavage, flaking paint, paint loss (both inter-layer and from the wall substrate), shearing overpaint and fading of exposed original paint.

While fading from prolonged exposure to intense sunlight and damaging ultra-violet light and heat is present, it is impossible to determine to what extent the artwork has been altered. Where original paint has been exposed, fading

is evident and appears extreme. Where the original paint has been protected by overpaint, the colors are much more vibrant.

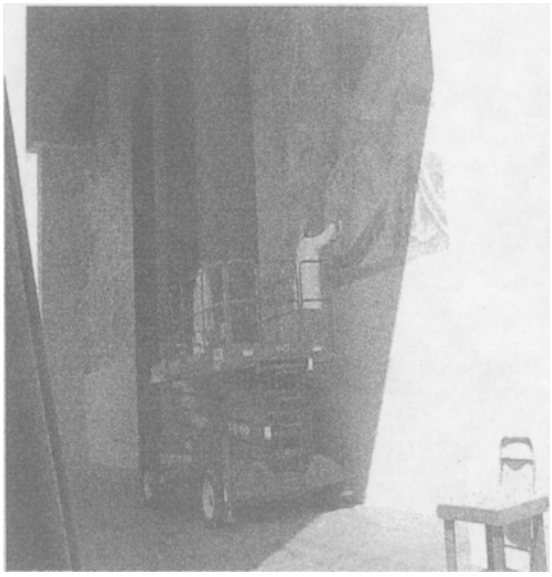
Not only has light caused damage, but also the exposure to harsh climatic conditions has taken its toll. On the murals with the most direct and prolonged exposure to sunlight, the layers of overpaint and the original paint layers have been unevenly and sporadically weathered away.

Condensation on the surface of the murals is another factor leading to deterioration. The Star report of 1996, noted "significant condensation on the mural surfaces on foggy, humid days", both summer and winter.". This condition, on the unprotected damaged surfaces has undoubtedly resulted in active response by the Portland Cement, leading to delamination.

Another concern is the damage caused by nesting pigeons in the alcoves above the murals whose by products are everywhere.

The Portland cement layers appear well adhered to the building's terra cotta structure and should not require treatment. The untitled lunette's structural layers are somewhat detached and will require consolidation. Some structural work may also be required on the large crack on Wheat Harvesters. Though signs of cracking are plentiful, the structure does not appear weak.

Conservation Treatment Proposal
Local consolidation of weak layers will be consolidated prior to cleaning, during cleaning and after cleaning. The top acrylic layers on some paintings will be removed with acetone. The solvent action is stopped by layers of different solubility. Several commercial and specialty strippers/gels are used depending on the underlying paint, the quality of the overpaint and the climatic conditions. During the cleaning, some mechanical will be required. The wires and other foreign attached materials will be removed. Fills in holes and large cracks will be made. Prior to inpainting, an initial varnish will be spray applied. A final varnish will be applied leaving the murals with a flat/matte appearance.



Short Term and Long Term Maintenance Requirements
Some type of sun abatement program will be instituted. Monitoring will help to identify fading rates. A maintenance program will be established with the City of Dallas.

Educational component
Please see www.fairparkmurals.com

A COMPARATIVE STUDY OF ITALIAN RETOUCHING TECHNIQUES

Eric Gordon, Head of Painting Conservation, The Walters Art Museum

Note: The photographs that accompanied this presentation were 35 mm color slides taken in studios throughout Italy and were taken on the proviso that they not be published.

Retouching systems and philosophies differ from one conservator to another depending upon education, experiences, preferences, clients, and individual paintings. A few years ago, I traveled around Italy trying to discover their methods of reintegrating paint losses in pictures. I found that the purpose of retouching in Italy is somewhat different than in America and that a range of methodologies is practiced in different regions.

In general, paint losses on pictures are treated differently in America than in Italy. In America for the most part the goal of inpainting is to make the viewer believe the picture has no distinct losses. In Italy, the acknowledgement of paint loss is accepted perhaps due to the vast amount of older art and architecture constantly in view in varying states of repair and disrepair. Additionally, more retouching possibilities exist blurring the distinctions between a complete loss, abrasion, and falsification.

About forty years ago new methods began replacing older, more deceptive means of restoration in Italy. Many of these practices may have come in response to earlier, traditional methods of trying to make a picture look perfect or undamaged. Indeed, these new philosophies came to the fore after the 1966 flood in Florence when vast amounts of art underwent restoration and a new generation of restorers was forced to evaluate previous treatments.

A common method of reintegrating paint losses in Italy is *tratteggio.* In this technique, a smooth white fill is inpainted with a series of short, vertical, linear strokes of selected colors that from a distance blend together with the original to form a unified picture. This method works especially well on early Renaissance, egg tempera panels where the original painting technique is similar to but slightly different than the restoration. Other techniques such as *neutro, vellatura* and *acqua sporca* are practiced as well. In these techniques, a neutral color is retouched over large, sometimes unfilled losses to lessen the appearance of the loss. Still in other cases, losses are left completely unfilled and unretouched down to the ground or support layer. Lastly, the traditional deceptive inpainting technique is practiced on small, contained losses and, with some conservators, medium to larger losses. These methods often are combined on the same picture and exist side by side with each other.

The medium of the retouching varies depending upon the preferences and experience of the restorer and the age and medium of the original picture. If the original is tempera, the retouching is usually watercolor; if the original is oil, retouching may be watercolor with "varnish color" glazes or just "varnish colors." "Varnish colors" refer to Maimeri brand paints (pigments ground in mastic) or dry pigments added to a poly-cyclo-hexanone synthetic resin or dry pigments added to a natural resin.

The Walters Art Museum, 600 North Charles St., Baltimore, MD. 21201

The influence of the *Istituto Centrale del Restauro* in Rome is strong and pervasive throughout Italy and Europe. Paolo and Laura Moro, instructors at the *Istituto*, shaped generations of restorers practicing in museums and private studios, on easel and wall paintings. Their graduates have trained another generation and their philosophy can be seen all over the country.

In Rome at the Vatican painting conservation studio, the majority of conservators trained at the *Istituto.* Their typical method of reintegrating losses is to inpaint medium-sized, discreet losses in a vertical *tratteggio* technique on smooth white fills. Small losses are customarily inpainted in a deceptive manner, completely hiding the damage. On a fairly damaged or abraded panel, often the losses are toned with a neutral color, *neutro*, or left completely unretouched. This often occurs on early panels and icons in areas where the materials and/or construction of the painting is evident due to condition, such as cracks between individual panels or holes left from metal adornments once attached to the pictures. Similarly, if the loss is substantial and in a critical area of design, it is frequently left unretouched. A good example of this methodology is a large, key-shaped, twelfth century, Roman school *Last Judgement* in the Vatican collection where many scattered losses have been left unretouched, down to the support. Those areas have been unified with a brown, wood-like tone or ground color depending upon the layer they are covering. Very small losses have been inpainted deceptively and medium-sized losses have been inpainted in a vertical *tratteggio* technique that from a distance blends with the original.

Severely damaged pictures offer greater challenges. A very damaged, transferred, early sixteenth century painting by Mariotto dello Stagno, *Madonna delle Rose* in the Vatican collection is an example of a picture treated in a different manner. Here, on a small- to medium-sized picture, a very thin, broken inpainted line separates the original paint from large losses that have been deceptively retouched. When the almost imperceptible line covers a dark area, the retouched line is a light color; when the dividing line covers a light area, the line is black. From a typical viewing distance, it is very hard to distinguish the broken line; the original and restoration meld into one seamless design.

It is interesting to note that when some of the Vatican conservators treat non-Vatican paintings privately, depending upon the client and the individual picture, a more deceptive method of inpainting is practiced. This is often at the request of the client who feels that the picture looks less damaged and indeed looks better if the loss is completely hidden. Also it is usually cheaper and quicker than *tratteggio.*

Another decisive factor in choosing a retouching technique may be the quality of the picture. I was told by some conservators that the higher the quality of the picture, the more likely they would use *tratteggio.* This decision also may be influenced by the final location of artwork-- whether it is in a pubic or private place. For example, a painting destined for a church may be inpainted in *tratteggio* while a similar painting might be inpainted in a deceptive manner for a private residence. This was the case for a Perugino altarpiece in San Sepolcro from the Duomo that was treated privately by local conservators. When visiting their conservation studio, most of their retouching on lesser

quality paintings was carried out in a deceptive technique while the Perugino for the town's main church was inpainted in *tratteggio*.

Retouching on paintings in Siena's Pinacoteca followed most of the practices taught at the *Istituto* and seen throughout Rome. Older restoration often was inpainted deceptively in what appeared to be an oil medium (now discolored), for example on a Giovanni di Paolo pilaster of St.Francis. More recent retouching on a large Taddeo di Bartolo *Crucifixion* displayed a beautiful imitation of gold in ochre, red and green *tratteggio*. On a fairly large Pietro di Domenico *Adoration of the Shepards*, the flat, neutral colors of a large patch of *neutro* were varied from one area to another in order to minimize the effect of the loss and suggest the design being imitated. In fact in some areas, the *neutro* was varied to the degree that shadows were incorporated in a *tratteggio*-type system to continue the three-dimensionality of the missing form. In other areas though, such as where the missing composition was clearly understood, between two original, well defined, outlined areas, the retouching was left vague and unspecific. In other words, in general, without a guide it is sometimes difficult to understand the complete logic of the retouching technique.

In a small, nearby town, Castel Fiorentino, in a modest picture gallery, recent retouching was carried out in methods similar to those found in Siena, with minor variations. An early 13th century *Crucifixion* displayed a similar type of *neutro* as that used for the missing gold of the Taddeo di Bartolo. On a larger, slightly later picture though, *St. Francis* by Bartolomeo della Gatta, fairly large areas of deceptive retouching were found adjacent to scattered areas of *tratteggio*. In fact, most of the inpainting was deceptive in the galleries, especially in the darks where *tratteggio* is more difficult to carry out successfully.

A large altarpiece in the Baptistery in Volterra displayed a unique variation of non-deceptive retouching. At the very top of this large painting, the torso and head of the risen figure of Christ were completely lost. To help the viewer understand the design from the loss, the restorer outlined and toned the missing figure. The background was darker than the risen Christ, which was contained within a dark line. In the end, one saw a linear silhouette of Christ against a darker background.

In the small town of San Gimignano, not far from Siena, a very large fresco by Lippo Memmi exhibited a variation on deceptive retouching similar to that seen on the Giovanni di Paolo in Siena. Large losses in the *Maesta* were inpainted deceptively but in slightly darker colors than the original so that the viewer clearly could understand the design in the loss while not mistaking it for the original.

The conservation philosophy at the Academia in Venice is similar to that found in Rome, only in practice it is taken further regarding the concealment of losses. Very few losses or large areas of *neutro* were visible. The conservator in charge, who studied with the Moros at the *Istituto*, mentioned that the Soperintendenza, the regional authority on visual arts, was leaning towards a more deceptive approach. To that end, the *tratteggio* was very fine and carried out in very small vertical strokes. An example of this exacting technique

could be found on the small Giovanni Bellini portraits where the original painting technique called for close observation of the paint surface. In keeping with this intimate examination, the *tratteggio* inpainting lines were very small and the broken up color was an exact match to the original.

In addition, at the Academia in Venice, some paintings of lesser importance were deceptively inpainted. The Moros's students from Rome who were adamant disciples of tratteggio frowned upon this technique which was practiced by those trained elsewhere. The studio's *tratteggio* was carried out in watercolor and their deceptive retouching was carried out on toned fills using "varnish" colors.

Curiously enough, in the nearby Peggy Guggenheim Museum, *tratteggio* was used on two modern early twentieth century pictures, a Delauney and a de Chirico. The inpainting on the Delauney, on view, was very successful and blended in nicely with the surrounding area. As it turned out, the *tratteggio* worked well with Delauney's personal technique of broken up color. The de Chirico was in storage and could not be seen.

A more distinct and conscious variation of Roman *tratteggio* is found in Florence. Here, the current *tratteggio* practice has grown out of the 1960's *cromatica astrazione* retouching technique used on Cimabue's *Crucifixion* for Santa Croce. This very large, important painting was severely damaged in the 1966 flood of the Arno and treated in the following years by Leonetto Tintori. The design in the extensive losses was broken down into very fine crosshatched lines of pure color that took as its starting point the colors of the surrounding area. Details of the missing areas, though well known through extensive photographs, were not imitated but rather broken up into basic tones applied in a linear technique. At present, *cromatica astrazione* is out-if-favor and rarely practiced. Besides being extremely time-consuming, it is now considered to be too distracting from the original and self-conscious.

Cromatica selezione is the preferred *tratteggio* technique practiced in Florence today. Here the conservator begins the reintegration process in a similar manner to that found in Rome by first filling the loss with a white gesso and creating a smooth surface. Then, generally using watercolor, tempera or dry pigments in dammar, the design is retouched in very small linear strokes that follow the direction of the missing design. For example, on a very large panel by Vasari damaged by the 1966 flood and treated at the Opificio delle Pietre Dure, the tratteggio lines used on figures were angled in all directions to follow the curves of muscles. This method is more imitative of the original and produces a more deceptive appearance. In contrast, the traditional Roman *tratteggio* built on strictly vertical strokes creates a mildly disjointed final appearance. Furthermore, in *cromatica selezione* colors are not broken down into a few basic component parts, as in the older *cromatica astrazione*, but they are broken down into colors with an exact match. In general, the current Florentine *tratteggio* is almost deceptive. When queried about this trend, the conservators said that it is what their clients want. In fact, many Florentine conservators currently are inpainting deceptively all the time for private clients.

In the Opificio delle Pietre Dure, *tratteggio* is used to imitate gold on engaged frames as well. When gold is lost in the picture, real gold is water-gilded; when gold is missing from a frame, the gold color is reproduced in very fine watercolor strokes on molded and carved gesso fills, an extremely time-consuming process. A fine example is Lorenzo Monaco's monumental *Coronation of the Virgin* from the Uffizzi. (An interesting comparison can be made to Monaco's other version, also recently treated, at the National Gallery in London.) While Florentine *tratteggio* successfully blends into a painted surface (especially tempera), the results often are less successful on a gold leafed frame when it calls attention to itself, as in *cromatica astrazione.*

Naples and Milan are catching up to the Roman *Istituto's tratteggio* technique. In general they are farther behind other centers in Italy and somewhat more conservative in their retouching. In Naples, dry pigments and Acryloid B-72 are the preferred materials while in Milan dry pigments and polyvinylacetate are more commonly chosen. Milanese restorers have varied their technique to include another type of retouching whereby a deceptively retouched area is covered in fine horizontal and diagonal dark lines, circled by another dark line. This technique was seen on recently restored pictures and from a distance was not too distracting.

In conclusion, presently Italians are inpainting in many different styles and materials. Those in charge of making aesthetic conservation decisions still do not want to completely falsify paint losses, but feel the need to approach compensation in a less restrictive way. Deceptive retouching is commonly found in "the trade" and for private conservators especially on less important pictures. And some *tratteggio* in museums is so fine as to almost be deceptive. Added to this movement is the fact that *tratteggio* is very time-consuming and requires lengthier and more costly treatments. Museum officials want their works back on the walls and not in conservation studios.

There are still two main schools of *tratteggio*, the Roman and Florentine. The Roman school, practiced at the Vatican and throughout Italy, still adheres fairly strictly to the colored, vertical stroke and *acqua sporca* or *vellatura*, the blended tone brushed over abrasion done in watercolor, tempera or varnish colors. In Florence and the surrounding area, one sees a lot of *cromatica selezione*, *tratteggio* that has been broken down into small lines that follow the direction of the design and color of the paint loss. Here too it is done with the same materials as in Rome. Conservators trained in these methods working in big cities and in smaller towns have come up with variations on these techniques. These include *neutro*, forms articulated on *neutro*, broken lines separating retouching from original, outlines of forms on differentially toned backgrounds, deceptive inpainting brought down a shade, and grids over deceptive inpainting. Materials are traditional and synthetic. And these methods are usually combined with at least some deceptive inpainting of small losses.

STUDIO TIPS

TIP ROUNDUP

Nancy R. Pollak

Inexpensive modular support boards

Lightweight support boards for oversized objects can be easily made from 1" thick extruded polystyrene insulation (commonly referred to as "blue board"). When made in several stock sizes, the boards can be pegged together to achieve a variety of overall dimensions. The board readily accepts pins, enabling objects to be held vertically for photography, inpainting and other tasks. One caveat: the boards will melt or deform with heat and should not be used for procedures in which heat will be involved.

To make a set of modular boards, cut the board into desired sizes (I cut the 4' by 8' boards into 2' x 4', 2' x 2' and 1' x 4' sections). Drill evenly spaced holes on each side of the board to accept short (4") sections of dowels for pegging boards together. Use a drilling jig (made out of scrap lumber) to insure that the holes will match across boards. To protect the edges of the boards from chipping, cover them with 2" framer's tape; cut holes in the tape to correspond with the drilled holes. Allow the Framer's tape to overlap 1" onto the face of the board; this provides a release surface when taping boards together. To assemble an oversize board, insert dowels between the board sections, and run a strip of packing tape over the join(s) to hold the boards together.

Getting a grip on inpainting brushes

Pencil grippers can be used on inpainting brushes to provide a larger grip and lessen the finger stress of holding small brushes. Grippers are short lengths of triangular- or wedge-shaped plastic with a pencil- sized hole in the center, available at office supply and craft stores. To fit the narrower diameter of the paint brush, pad out the brush handle with tape before sliding on the gripper. As an added benefit, brushes fitted with grippers don't roll and can be laid down without the brush head resting on the surface.

Cleaner solvents for brush cleaning

Diluent for cleaning inpainting brushes rapidly becomes cloudy from accumulated pigments. To keep the solvent clearer, place a cotton pad at the bottom of the solvent jar to catch floating pigment particles. Cut a round cotton pad (found in a store's beauty section) to fit the bottom of the jar, fill the jar with solvent and use. The cotton will hold the pigments as they settle out of the solvent, keeping them from redistributing if the jar is moved and making clean-up much easier when changing solvent.

Conservator of Paintings and Painted Textiles, Art Care Associates, Post Office Box 4141, Frederick, MD 21705.

PERSONAL DISPOSAL CONTAINER FOR USED SWABS

Frederick Wallace

Over the years many different types of containers have been adapted by conservators for the temporary disposal of used cotton swabs generated during treatment procedures. Two popular types used for this purpose are glass surgical dressing jars and metal coffee cans. Yet these and most other personal swab disposal container systems have design inefficiencies that become apparent upon use by working conservators. Indeed I have found this to be the case at conservation laboratories throughout my career. Thus I devised an alternative method of adapting common plastic containers to provide a more successful solution for swab disposal during treatment.

Of primary importance is that used swabs often hold volatile substances that can be harmful to the user. Thus the container that is selected and modified must be of such a design that it will minimize user exposure to solvent vapors. Nevertheless, many personal swab disposal container systems do not satisfactorily meet this criterion. This is true of surgical dressing jars, which allow solvent vapor to escape when the lid is removed to add more used swabs. Similarly, swab disposal holes cut in the sides of coffee cans or those made in the top of their plastic lids also provide a means of ready exit for solvent vapor.

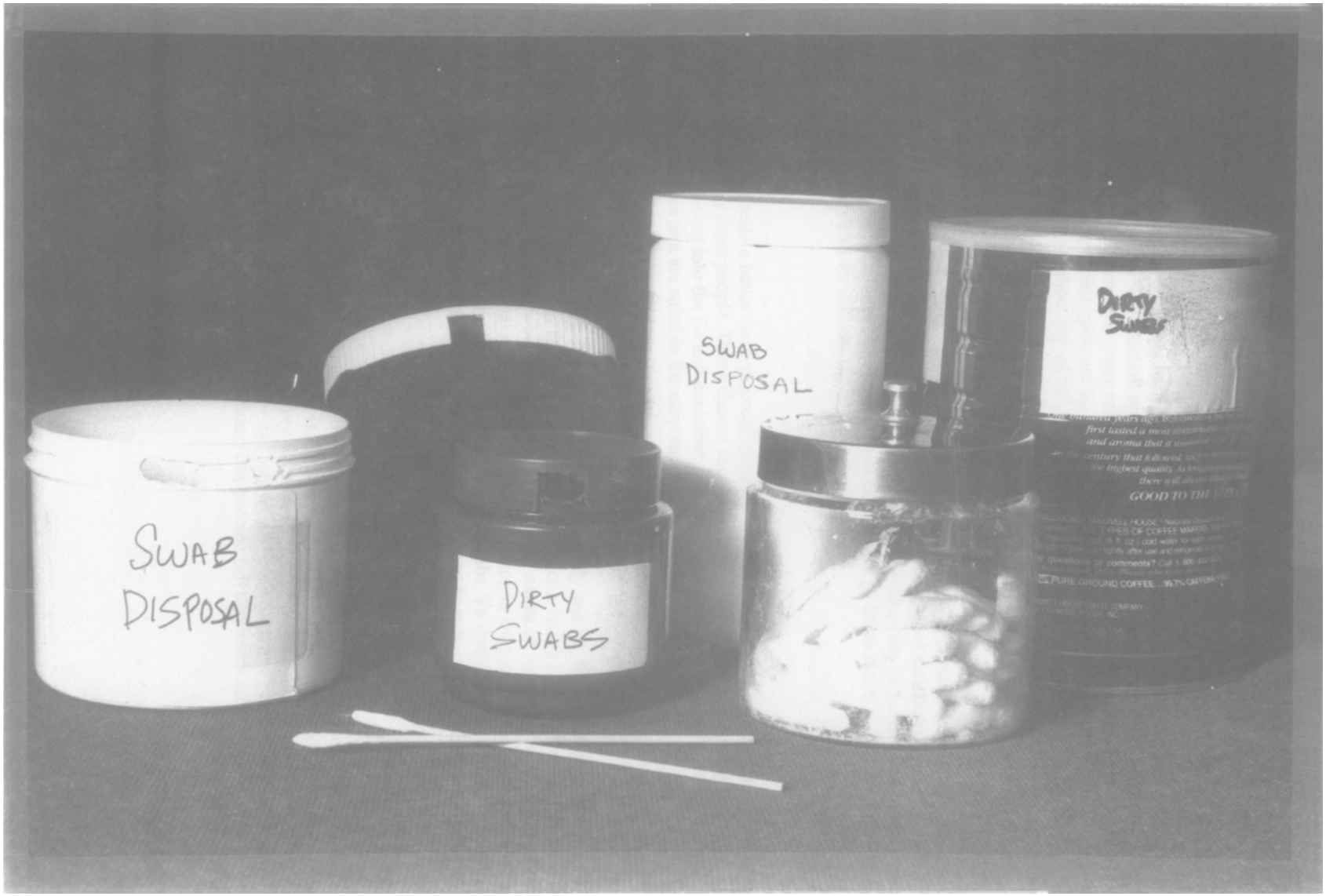
It easily is possible to create a better swab disposal container by utilizing various lidded plastic containers that usually are discarded by most people. Those chosen should be tough and resistant to most solvents, yet soft enough that shaped holes can be cut into the lid and container. Plastic jars for facial cream, dry chemicals and adhesives are some types of containers that are suitable for adaptation.

The key to the design is the placement of holes in the container body and lid. In the container body, holes should be cut or drilled into the threaded part of the rim (where the lid twists on). Holes of different diameter and shape can be created (fairly close to one another is best) to accommodate cotton swabs of varying size. Using the different sized holes as appropriate for swab removal reduces the tendency of cotton to snag and collect at the edge of the entry hole, eventually making it more difficult to pull off additional swabs. To complete the design, the container lid should be put back on and marked on its rim wall, so that a hole can be made therein that roughly coincides with the holes in the container rim.

With just a slight turn, the hole in the lid can be aligned with one of the holes in the container rim. Swabs then can be inserted through both holes and pulled off to fall into the container. After swab removal the entry point can be closed off by tightening the lid. This design allows for swabs to be deposited into the receptacle without removing the lid. Only a minimal amount of solvent vapor can escape, and only for a few brief seconds at a time. The lid only needs to be completely taken off when the container has become full and needs emptying.

Frederick Wallace, Associate Conservator, Cincinnati Art Museum, 953 Eden Park Drive, Cincinnati, OH 45202

Of course some conservators may not feel the slow continual escape of solvent vapors from swab receptacles is a significant health risk, or even a nuisance. It is certainly better to be safe than sorry, particularly when it requires little effort. Since, as described above, it is not difficult to make a safer, more useful container, it seems worthwhile that conservators consider trying out this design.



Examples of containers used for swab disposal: (left to right) three examples showing the Wallace swab disposal container design, a surgical dressing jar, and a modified coffee can.

DRY PIGMENT CAROUSEL

Perry Hurt, Painting Conservator

How to organize all those little pigment jars? In October 1999, I attended a workshop by Jim Bernstein at the Campbell Center in Illinois (which I highly recommend). As a result I was inducted into the ranks of dry pigment inpainters and needed to construct something to hold my pigments. The dry pigment blocks I'd seen were either flat or stairstepped. It occurred to me that a round stairstepped block on a turntable might be a more efficient use of space and more convenient to use, making any one pigment easier to reach. I've found it very useful, particularly in conjunction with a limited palette (15-20 colors) of prepared paints such as Charbonnel, PVA, or watercolors.

Before presenting my idea in Philadelphia I asked Jim Bernstein if my carousel was sufficiently novel to present as a tip. Jim encouraged me to present the tip and commented that my carousel was essentially a working model of Philipp Otto Runge's "Farben Kugel" (1810) or "Color Sphere". Runge was a late 18th century color theorist and his sphere was the first attempt at a 3-deminsional model for color. Jim wrote, "You might mention Runge's "Farben Kugel", which gives the suggestion of colors appearing on a globe according to longitudes and latitudes of color hue and value. The carousel is essentially a "top-half" view (the underside version being very impractical for dipping into pigments)."

Runge's sphere clearly illustrated an advantage that I have now experienced but had not anticipated when I built the carousel. The carousel gives a very "intuitive" layout of colors. With enough variety and variation of pigments the carousel stack becomes a continuous color wheel, hue changes around the diameter of the stack and value changes going up or down the stack. For instance if I have an inpainting color mixture that requires a cool color I can turn to the blues and greens, and then decide what hue or value is appropriate. All my pigment choices are clearly laid out in a logical progression.

Advantages:

- Easier to reach any one particular pigment.
- Logical progression of pigments by order of value and hue, makes use more intuitive.
- Best if dry pigments are used as tinting for or along with prepared paints (i.e. Charbonnel, PVA, watercolors).
- Styrene grips the pigment bottles making it possible to open/close the bottles with one hand.
- The carousel action gives you something to play with if the inpainting becomes very boring. Can also double as a wedding cake in a pinch.

Drawbacks:
Conservators who paint solely with dry pigments would probably not find the carousel useful.

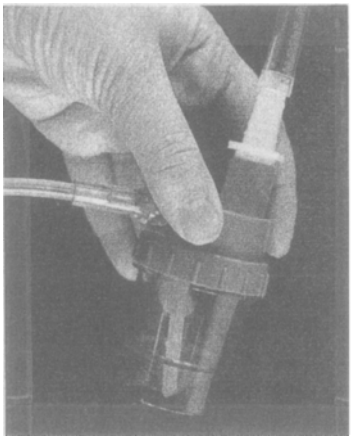
- Less convenient to use if you need multiple jars open at once.
- You can't see all the colors at once.
- Styrene is difficult to cut cleanly and does not have the most pleasing appearance aesthetically speaking.

Perry Hurt, Conservator for Regional Conservation Services, North Carolina Museum of Art
2110 Blue Ridge Road, Raleigh, North Carolina 27607

Construction	Materials	Pigments
The carousel was built as a working model. I used inexpensive materials and pinned it together instead of gluing to allow for modifications. • Four layers of styrofoam, 15", 12, 9, 6 in diameter • 78 holes, 1" dia., on 1½" centers, centered on the 1½" shelves • escutcheon pins toenailed in to attach layers	• Styrofoam, DOW, 1" thick, extruded polystyrene insulation, available at any building supply store • Jars, Fischer Scientific, 15ml, @ 2¼" tall, 72 jars for $25 • Rubbermaid Turntable, @ $4 • Long brass escutcheon pins to attach layers • Forstner drill bit, to make round flat-bottomed holes	• Sinopia, 3385 22nd St(A Guerrero) San Francisco, CA 94110 • Kremer Pigmente, Inc. 228 Elizabeth St (@ Prince) New York, NY 10012

A SIMPLE METHOD OF CONSOLIDATION USING AN ADULT RESPAN NEBULIZER AND AN AQUARIUM PUMP

Margaret Lawson, Paper Conservator

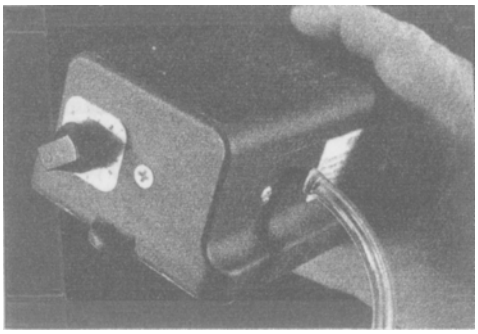


Supplies:

Nebulizers are used in the medical field to deliver medication in a very fine mist. They no longer require a prescription in the U.S. and can be purchased individually from hospital supply stores and some pharmacies for under $5.00. Also check science surplus stores. Even with careful cleaning they do not work forever. They must be disposed of periodically. Nebulizers can utilize the same stand, tubing and aquarium pump as is used with an ultrasonic mister. Where the ultrasonic mister is sometimes cranky to set up, nebulizers mist almost immediately. The system is light weight and easily portable. Nebulizers are best for small consolidation problems not larger than the size of a fingernail. Larger areas or extended use of the nebulizer will result in too much bubbling and the ultrasonic mister is more satisfactory.

The nebulizer we have done most satisfactory experimentation with is an Adult Respan nebulizer without a mask. (Item # R-2405S, B & F Nebulizer with 7 foot Saflo), lowest quantity is a case of 50, total cost $80 prepaid. Respan Products Inc., 8 Erinville Drive, Erin, Ontario NOB 1TO, Canada. Telephone: 519-833-9774, Fax: 519-833-7453, www.respan.com, e-mail: janey@respan.com. There are a number of other makes which may also work as well or better. Success relates to the air pressure system and the viscosity of the solution. Conservators have tried a variety of compressors and pumps with varying results.

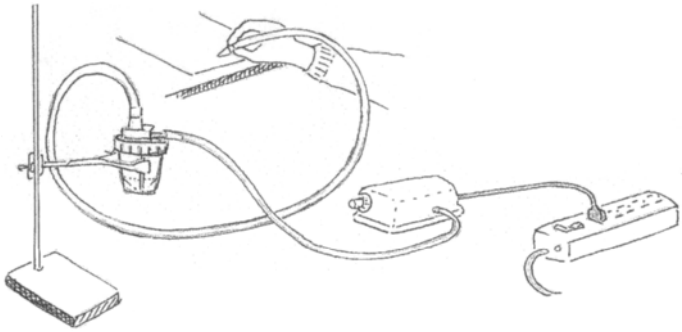
Not all aquarium pumps work with the nebulizer. Some are too weak. The aquarium pump used with our ultrasonic mister is a Tetra Luft Aquarium Air Pump, (cost about $50.) which was discontinued by the company just about the time we discovered that it worked with the nebulizer. The maximum pressure of the Tetra Luft Aquarium Air Pump is 7.25 psi.. The adjustable rheostat which controls the amount of air flow is an important advantage of this pump. Daria Keynan has worked enthusiastically with nebulizers and spent time researching alternatives since the Tetra Luft Air Pump was discontinued. At present, Daria suggests the Hagen Optima Air Pump does a good job.



Paper Conservation, The Metropolitan Museum of Art, 1000 Fifth Avenue, New York, NY 10028

Tubing: Nalgene Tubing 180PVC Tubing FCA/USP, 5/161D, 7/16OD, 1/16 wall, quantity CS 50, item # 14 176 30, cost: $70.10 for 50 feet, from Fisher Scientific Co., 355 Corporate Blvd., Newark, DE 19702, Telephone: 1-800-766-7000, fax: 1-800-926-1166. Short lengths may be purchased from boating or well stocked hardware stores. This is the larger sized tubing which connects to the top of the nebulizer.

Assorted Quick Disconnects: (for fine point tip and hose connection). Scienceware, bag of 12, cat. No. 19735-0000, Bel-Art Products, Pequannock, NJ 07440-1992. Cost $15.30 a bag. (We ordered these from Daigger: Telephone: 1-800-621-7193, fax 1-800-320-7200.) The disconnects are used for the fine point tip and as the connection piece for the tubing to fit the nebulizer.



Recommendations:

Test the nebulizer for stability with solvents. The mist formed is extremely fine, almost invisible. Use a microscope to view the consolidation process. Plug the pump into a surge protector with an on/off switch for ease in shutting off the nebulizer when it is not being used to perform consolidation. This saves the solution from excessive agitation, and accumulated bubbles which impair the function. It will also save the conservator from having to replace the solution frequently. The following describes a current practice and observations, but there may be better solutions. Experiment.

Method and Materials using Adult Respan Nebulizer and Tetra Luft Aquarium Air Pump:

1. Prepare consolidant. Prepare a warm solution of 1% gelatin. Measure 15 mls. of 1% gelatin and 5 mls. of ethanol and put in the nebulizer. Most solutions tested in this nebulizer system require a good amount of alcohol to work. Otherwise the solution is too heavy and the tubing clogs.

2. Connect the hoses and plug in the system. Consider placing the nebulizer lower than the surface where you are working. This does not stop condensation in the tube, but it may help to prevent some drips from forming in the tip.

3. Use a piece of dark matboard or paper to test the amount of mist forming and the gloss. Test the strength of the pressure on your hand. It should be soft so no loose flakes will be dislodged. (I set the dial around 7 on our pump.)

4. Successful consolidation usually requires two or more passes over an area. Alcohol can evaporate quickly so it is important to check that the solution is not becoming thick yielding a glossy surface or clogging the nebulizer parts. Replace with fresh solution or add more alcohol as necessary. As said before, turn off the pump unless actually treating at the time. It saves the solution from unnecessary agitation and too much bubbling.

5. Maintenance during operation may require the top of the nebulizer to be soaked in warm water to remove gelatin residues which clog the inside during extended treatment time. The entire nebulizer, large tubing and tip must all be

cleaned with warm water after use. Boiling water is too hot for the plastic. To reduce the opportunity for mold formation in the tubing it can be lightly flushed with a few drops of alcohol after washing.

Experiments with conolidants:

Food coloring was added to mixtures to see how much mist was formed and how they behaved in the tubing, with and without alcohol. Various mixtures without food coloring were also tried and sprayed over friable pastel as a test of the ability to consolidate materials. They include:

Funori: (Unknown percentage tried for papyrus). Formed extensive bubbles, did not mist. When 5 mls. of ethanol added, it still foamed. When 5 more mls of ethanol added, a minimal spray resulted. Funori was also tried in our ultrasonic mister, but it did not generate a mist.

Gelatin: works well with 1% gelatin and some alcohol. In 2% solution or without alcohol it forms bubbles with hinder or halt the operation. It also may be glossy at 2%.

Klucel GF: Warning. 1 % in ethanol was possibly too thin a solution to work. 2% solution Klucel began spraying a white mist while experimenting on black matboard. Not good. More experimentation with various solutions is needed.

Methyl cellulose: tried as a .25% solution. It sprays easily, but would take a number of passes before consolidation would be accomplished.

Helpful background:

Nebulizers

Arnold, David H., "Recent Advances in Mist Consolidation of Powdery Surfaces," The American Institute for Conservation of Historic and Artistic Works, Abstracts of papers presented at the TWENTY FOURTH ANNUAL MEETING, Norfolk, Virginia, Jun 10-16, 1996.

For more information and many helpful tips: email: dharnold@aol.com

Ultrasonic Mister

Dignard, Carole, Douglas, Robyn, Guild, Sherry, Maheux, Anne and McWilliams, Wanda, "Ultrasonic Misting, Part 2, Treatment Applications," JAIC, volume 36 (1997): pp.127-141.

Maheux, Anne F. and McWilliams, Wanda, "The Use of Ultrasonic Mister for the Consolidation of a Flaking Gouache Painting on Paper," The Book and Paper Group Annual, Volume 14 (1995): pp. 19-25.

Michalski, Stefan and Dignard, Carole, "Ultrasonic Misting, Part 1, Experiments on Appearance Change and Improvement in Bonding, JAIC, volume 36, number two, (1997): pp. 109-126.

Weidner, Marilyn Kemp, "Treatment of Water-Sensitive and Friable Media Using Suction and Ultrasonic Mister in Paper Conservation," The Book and Paper Group Annual, Volume 12 (1993): pp. 75-84.

Acknowledgments:

I would like to gratefully acknowledge our colleagues in Canada who have done so much to develop the ultrasonic mister, as well as Marilyn Weidner and Abigail Quandt, and David Arnold and Daria Keynan for their work with nebulizers and their enthusiasm and generosity in sharing material. Finally, special thanks to all my colleagues in the Paper Conservation lab at the Metropolitan Museum, for their support with work on this tool.

CLEAN AIR

Robert Proctor, Painting Conservator

We could all use cleaner air in our studios. An economical, yet efficient and practical fume extractor can be purchased from Lab Safety Supply. This device measures H) 20" x W) 12 1/2" x D) 12 1/2" and is fitted with two 40" hoses with openings that can be adjusted to be any size from 3-6" in diameter. The hoses, while flexible, are made so they are rigid enough stay in position. Several different filter options are available but the one that will hold 5 pounds of activated charcoal is recommended. This will filter out the majority of organic solvents used by painting conservators. It is very effective in capturing aromatics and aliphatics like xylenes, mineral spirits, Petroleum Benzine and naphtha, but is less effective for removing alcohols and ketones. I have compared it to other similar units and found the design simpler and easier to use. It is more powerful than the competitor's while remaining as quiet or quieter. They also make a wheeled trolley to support the unit which I bought but ended up returning because it was expensive and the wheels marred my pine floor. (I made a small wheeled platform from plywood, with softer wheels and metal edging I bought at Home Depot for a fraction of the cost).

To order phone:	Lab Safety at 1 800 356 0783	
Ask for the:	2 arm Fume extractor	Product # 74082
and	6" refillable carbon filter	Product # 35561

The total with shipping and taxes will run just over $1000.00

For a good, general air cleaner (not for extraction of concentrated solvent vapors) we also have a Healthmate HEPA Air Filter that is run on low speed 24 hours a day and turned to "high" after varnishing, etc. This air cleaner costs less than $400. The Healthmate can be purchased on the web from www.gaiam.com. Go to "Shop" then "Home and Garden" then "Air Quality" then "Filters and Purifiers" page 2 and click on Healthmate HEPA Air Filter.

THE BARBER NO BOO BOO

Gayle S. Clements, Conservator

The Barber No Boo Boo is a coaster size cushion shield like a mouse pad which is used when mounting a dustcover (Coroplast or Foamcor) over a painting's reverse. The shield keeps the screwdriver (when it slips) from scratching the dustcover.

Order from Gilcrease Museum Department of Art Conservation (GMDAC)
Make donation of $ 5.00 to GMDAC/Internship Fund
Includes shipping and handling.

LAZY SUSAN PALLET CAROUSELS

Gayle S. Clements, Conservator

Use the small 18" diameter manual "Lazy Susan" turn table under heavy bronze sculptures of medium size.As the sculpture is cleaned, waxed, etc. the Lazy Susan can be turned around with the sculpture turning withit. The small "Lazy Susan" supports up to 1000 pounds. Diameter is 18", height I". It's weight is 56 pounds and is priced about $ 139.00.

Use the larger rotating "Lazy Susan" ring for large frames and paintings with dust covers "face up for the paintings please!" Supports a 2,000 pound capacity, part # CA-40-2. Diameter is 40", height is 2 1/4". Its weight is 40 pounds for about $ 284.00.

T. & S. Equipment
219-665-9521
P.O. Box 496
Angola, Indiana 46703

DECCO FELT DISPENSERS

Gayle S. Clements, Conservator

Make holders out of L-envelopes and matboard scraps. Use brass round head fasteners (3" size) to hold the decco felt onto the matboard. Seal Mylar sheet on the right to allow removal of the felt roll when needed. Print out size of the felt (1/2", **1/4"**, etc.) and attach the label to the lower left comer of the matboard for easy reading of the desired size. Stack holders upright in the cabinets for fast, easy retrieval without getting a tangled mess!

L-envelopes
(4 mil)
University Products
1-800-532-9281
517 Main Street
518 P.O. Box 101
Holyoke, MA 0 1 041 -0101

Large Brass Head Fasteners
Corporate Express
800-270-9711
e-mail: CorporateExpress.com
Nationwide Offices

Decco felt
Decco Felt Corp.
555 S. Vermont Avenue
P.O. Box 156
Glendora, CA 91740
1-800-543-3226

Gilcrease Museum Department of Art Conservation, 1400 Gilcrease Museum Road,Tulsa, Oklahoma 74127-2100

IT'S A WRAP

Jeremy Peill, Sole Proprietor

This tip has two aspects - one material, and the other psychological. It is especially for those of you who have endured clients, who have themselves damaged the work to be restored/conserved. The case presented here involves a dealer client, who delivered a 12 ' by 4' mural for removal of overpaint, unsuitably rolled, and carelessly packed, causing damage to the edges of the canvas. On completion of the project, the client took some of the gilt off the lily, by insisting on coming to collect and transport the mural himself.

To make him conscious of the need for properly protective packaging, and careful handling, he was given the task of locating and bringing along with him a particular style of rigid drum outer packaging for the piece. Although the client was unable to find an example, he did find an equally acceptable medium to serve as both inner and outer packaging: virgin bubble-wrap, wider than the mural's depth. In fact, he was conscious enough of his mission, to spot a roll of this wrap, outside a store opposite his framers, to make the connection, and to buy it from the merchant, on the spot.

Thus equipped, he appeared at our studio in some triumph. We spread the outer film of the wrap on the floor, below the end of the table on which the mural lay full length. Next we put the roll of bubble-wrap on this film, with a spindle through its core. The author then fed the wrap out across the face of the mural and over its far end, while the client kept the roll in place, and clean. Next, standing between the roll and the worktable, on either side, the two of us carefully drew the near end of the canvas onto the roll, under its layer of wrap. When this end was securely engaged, we then used the roll of wrap to reel in the rest of the canvas, until all of it was securely interleaved with the re-rolled bubble-wrap, with ends and edges well cushioned for handling and transport in the client's own vehicle.

This process, and the finished result, was photographed, and the client's new commitment can be clearly seen from the expression on his face.

A word of caution: this tip applies only for handling and local transport - for third party shipment, the drum type outer packaging would obviously still be needed - and no study has been done on the compatibility of bubble-wrap for prolonged storage of oils on canvas.

Jeremy Peill,
Paintings Cleaning & Restoration,
P.O Box 209,
Cuddebackville,
NY 12729-0209.

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