PAINTINGS SPECIALTY GROUP

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POSTPRINTS

OF THE PAPERS PRESENTED AT THE SIXTEENTH ANNUAL MEETING

NEW ORLEANS, LOUISIANA, JUNE 1-5, 1988

At long last here they are:

The Postprints of the Paintings Specialty Group

American Institute for Conservation,

1988 Annual Meeting

June 1 - 5

New Orleans, Louisiana

As you will notice this first edition of the Postprints includes only seven of the papers presented at the Paintings Specialty Group Session. That is because most of the papers not presented here were previously committed or later requested for publication in the Journal or elsewhere. As the purpose of these Postprints is to make available to the membership research not otherwise published, we have no reservations about not printing everything that was presented at the meeting. In fact, it is a testment to the quality of the papers presented at the Painting Specialty Group Session that so many were requested for publication elsewhere. Later in the year we will be happy to prepare a directory of the papers not included in these Postprints and where you can find them published. Until then, read, enjoy, and learn. We hope this is the start of a long and fruitful tradition.

Pauline Mohr
Paintings Specialty Group Chariperson

Wendy Samet
Paintings Specialty Group Vice Chairperson

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AN INVESTIGATION OF MATERIALS AND TECHNIQUES OF SEVEN PAINTINGS BY CHARLES WILLSON PEALE

Karen Ashworth, Conservation Fellow; Teresa A. Lignelli, Conservation Fellow; and Marigene H. Butler, Head of Conservation, Philadelphia Museum of Art

In 1987, the Philadelphia Museum of Art Conservation Department completed a two year project funded by the National Endowment for the Arts that encompassed the treatment and technical investigation of seven portraits by Charles Willson Peale. The seven paintings can be divided into two groups; five comprising members of the Cadwalader Family painted in 1770-72, and the portrait pair of John and Margaret Bayard, painted in 1780-81.

Besides being excellent examples of Peale portraiture, these paintings, particularly several of the Cadwalader group are important documents of 18th century Philadelphia society, providing a detailed visual record of period costumes and interior furnishings.

Charles Willson Peale was 28 years old when he returned home to Annapolis, Maryland in the Spring of 1769 after two years of study in London with Benjamin West. The young artist had hoped the eleven men who had financed his London training would become patrons, through commissions of portraits of themselves, family and friends. However, with the exception of eleven commissions for John Beale Bordley, who was most responsible for Peale's trip to England and a longtime friend, only sixteen commissions came from the other sponsors, and Peale was forced to look elsewhere for additional work. Bordley's introduction of Peale to John Cadwalader was important in establishing one of the most fortunate artist-patron relationships of Peale's early career.

John Cadwalader, a wealthy Philadelphia merchant, first became aquainted with Peale's paintings during the Summer of 1770 and commissioned nine works from the artist during the next three years. Five of the commissions, paintings of his family, including a group portrait of John Cadwalader, his wife Elizabeth, and daughter Ann (Plate I), were intended to hang in the front parlor of a lavish new home Cadwalader was renovating in Philadelphia. The other four portraits included one each of his father, Dr. Thomas Cadwalader, and mother, Hannah Cadwalader. Portraits of his brother, Colonel Lambert Cadwalader, and sister, Martha Cadwalader Dagworthy, completed the ensemble. The large canvases, all measuring approximately 51 x 41 inches provided Peale with the opportunity to demonstrate his abilities and knowledge of the fashionable portrait style. Cadwalader's prepayment of 110 pounds to the artist in 1770, for commissions not yet completed, signified his confidence in the artist, and the prominent display of the portraits in his parlor provided exposure which generated many orders from other patrons. Peale's permanent move to Philadelphia in 1776 had been encouraged by Cadwalader since 1770 and was in large part due to the favorable response to the Cadwalader portraits he had received.

The companion portraits of Mr. and Mrs. John Bayard, measuring 50-1/2" x 40-1/2" were painted in 1780-81. According to Charles Coleman Sellers, the noted Peale scholar and biographer, "The portraits of Colonel and Mrs. Bayard, mark with his large portraits of Mr. and Mrs. Robert Morris, his retirement from politics and the willingness of influential men of opposite political faith to make that process easy for him by their patronage."[1] Several years earlier, Peale had lost John Cadwalader's friendship and patronage to political differences.

John Bayard was Peale's life long friend. Margaret Bayard's death on April 13, 1780 presents the possibility that her portrait was painted posthumously. Peale would later paint John Bayard's second wife, but turned down requests in 1792 and 1801 to paint portraits of the third and fourth wives.

The following discussion will focus on the results of our investigation of Peale's materials and techniques. Peale makes repeated references during his working life to his use of materials, in his notes, diaries and letters. There were several references which dated from the period under discussion. These included a letter from Peale to Henry Laurens of March 6, 1780 which lists materials he was requesting from Europe around the time the Bayard portraits were being painted. The list included requests for lead or flake white, vermilion, Naples yellow, lake for miniature painting, canvases of varying sizes, and a "softening tool" used for blending colors.[2] Prussian blue is mentioned in another letter of 1770-71 to John Beale Bordley, during the time when the Cadwalader portraits were being painted.[3] Many of Peale's references regarding materials pertain to technical problems resulting from experimentation. With regard to the period of time under discussion, for example, Peale wrote on August 16, 1790 of his earlier experimentation with the use of red lakes in shadows. Referring to his portrait of Mr. Ringgold painted in 1775; "The coloring as most of my works of that period, the shadows too cold, almost black, having used no red in my shading except lake. The fading of the lake left the black predominant in the middle tints and deep shades..."[4] It was hoped that the technical analysis of these seven paintings would confirm Peale's material references and further knowledge and understanding of his working methods.

Peale's technique in these seven works was studied using a low power stereo microscope in examining brushwork, and mounted cross sections to determine layer structure. X-radiography was used in studying ground application, and in combination with infrared reflectography in confirming the absence of any significant artist changes. The artist's palette was determined through pigment identification by polarized light microscopy and X-ray diffraction.

All of the portraits show a similar direct application of opaque, fluid oil paint with brushstrokes worked wet into wet. The backgrounds

and drapery are usually thinly applied, and the modelling well blended with only the lightest highlights showing increased brushmarking and impasto. Since the portraits were directly executed with virtually no modification of composition, most of the cross sections show a simple layer structure of usually one, but sometimes two paint layers where highlights or costume detailing were added on top of more broadly painted areas. One of the few cases where Peale modified his design slightly was seen in a cross section taken from the green tablecloth in the John Bayard portrait. In this area, Peale appears to have extended the green cloth further over the table and under the books in the lower right corner of the table. The modification accounts for the double paint layer seen in cross section.

Given that there are only ten years separating the Cadwalader and Bayard portraits, it is not surprising that his method of painting changes very little during this time. However, it is interesting to note the evident attention to detail Peale pays to the earlier Cadwalader portraits. Details of the Family Group portrait (Plate I), such as the meticulously painted brocade of John Cadwalader's coat, and the carefully executed jewelry of Elizabeth Cadwalader indicate the care with which Peale painted the portrait. One must remember that the Cadwalader commission was extremely important to Peale in establishing his reputation in America, particularly in Philadelphia. Peale wrote from Philadelphia to John Beale Bordley on July 29, 1772: "I am once more making a Tryal how far the Arts will be favoured in the City, I have now on hand...one composition of Mr. john Cadwalader, Lady and Child in half length Sise, which is greatly admired...I have some prospect of the Quakers incouragement for I find that none of the painters heretofore have pleased in likeness--whether I can a little time will show."[5] The Family Group portrait can be considered, then, as representing one of the young painter's best efforts.

By the time the Bayard portraits were painted in 1780-81, Peale's reputation was well established, and he seems to take a more formulaic approach, in painting more broadly throughout the whole composition. One can see the differences in Peale's handling of the paint between the two portrait groups by comparing the earlier costume treatment in Mrs. Cadwalader of the Family Group (Plate I) and that of the later Mrs. John Bayard (Plate II).

A final example of comparison between the table in the Family Group portrait and the table in the Mrs. John Bayard portrait serves to underline the greater attention paid to details of reflection and wood grain in the earlier painting.

Going on now to other aspects of materials and technique: We found all seven of the original supports to be single-thread, plain weave linen canvases, with only slight variations in thread count. The majority of the canvases have between 12-14 threads/cm. in both warp and weft directions. Two exceptions to this measurement are the finer canvas weave found in the Martha Cadwalader support, and the coarser canvas weave of the John Bayard portrait.

In all seven paintings, the grounds' appearance, texture, and solubility indicated an oil medium. The ground colors ranged from white, to a mid-value warm grey. Pigment mixtures of the grounds consisted of lead white alone, or with added percentages of calcium carbonate, iron oxide red, yellow or black. The grounds of both Mr. and Mrs. Bayard contain a significant amount of iron oxide yellow, which is absent from all but one of the grounds of the earlier Cadwalader portraits.

With the exception of the Margaret Bayard portrait, in which a double ground layer is visible in cross section, all of the paintings have a single, thinly applied ground layer. The method of application is clearly visible in X-radiographs of the paintings where broad linear patterns unrelated to the compositions indicate that grounds were applied using a spatula. All of the X-radiographs reveal this method of application, with some variations in the marks made by the tool, from the widely spaced diagonal lines or arcs visible in Martha Cadwalader Dagworthy and The Family Group to the denser, more random pattern in Mr. John Bayard to the lower contrast, fanlike pattern in Mrs. John Bayard.

In support of our observations, Peales' use of a wooden spatula for ground application is well documented by his notes and by two letters to his son Rembrandt, dated August 3, 1817 and February 23, 1819.[6] Although these letters date almost fifty years after the execution of the Cadwalader portraits, the use of the spatula would account for the distinct patterns seen in the X-radiographs, and the evidence suggests Peale's consistent use of this tool for ground application throughout his career.

The pigments identified in these seven paintings show a general consistency of use for the span of time in which Peale painted them. The palette of nine pigments is exactly the same for the Cadwalader group and the two Bayard portraits, with slight variations in pigment mixtures used for similar specific colors.

With the exception of some highlights consisting of 100% lead white, all of the paints are mixtures containing two to seven pigments.

I will now run through descriptions of the major paint tones sampled, and how the nine pigments identified were combined to produce them. Beginning with the whites, most of the whites consist of lead white with a small percentage of bone black. The white lace collar of Mrs. Bayard also contains iron oxide yellow and calcium carbonate.

The red paints consist of vermilion, iron oxide red, and an organic red lake in varying mixtures. A sample taken from a red flower in the hair of Mrs. Cadwalader of the Family Group, is mostly vermilion with small amounts of lead white and bone black. Another sample, taken from the background drape in the Margaret Bayard portrait, consists of calcium carbonate, lead white, iron oxide red, iron oxide yellow, and bone black.

In several instances, where darker reds were predominantly iron oxide red, for example, in samples taken from the folds of Mr. Bayard's jacket, the presence of up to 30% calcium carbonate in the mixture made these colors resemble our reference samples of Venetian red which contained less than half ferric oxide with the rest a mixture of calcium carbonate and calcium sulphate. X-ray diffraction confirmed these dark red particles to be the hematite form of iron oxide red. Well preserved red lake particles were seen in samples taken from the highlight of the jacket fold. A greater proporation of bone black was found to produce the shadowed area of the same fold. XRD of these samples also confirmed the presence of bone black, lead white and calcium carbonate.

Although there are a number of green tones in the paintings, no green pigment was discovered in these pictures. Green fabrics, draperies, tablecloths and foliage are generally mixtures of iron oxide yellow and Prussian Blue. A sample taken from the green curtain in the portrait of Hannah Cadwalader contains only iron oxide yellow and Prussian blue with a small amount of calcium carbonate. There were several green paints, particularly in the distant landscapes of the Hannah and Colonel Lambert Cadwalader portraits where Peale combined bone black with Naples or iron oxide yellow to produce the green color. A small percentage of vermilion was also present in both of these mixtures.

Prussian blue is the only blue pigment that appears in these seven paintings. The blue costumes of the Cadwalader portraits are colored with it in similar proportions. A sample taken from the sky in the Hannah Cadwalader portrait contains 15% Prussian Blue in lead white with smaller percentages of calcium carbonate, vermilion, and iron oxide yellow.

The browns, which occur in every painting in tables, backgrounds, etc. consist generally of iron oxide red or vermilion, iron oxide yellow and bone black in lead white, but curiously no single brown pigment was discovered. Grey and black paints are similar in containing iron oxide red and/or yellow with lead white, calcium carbonate or bone black predominating, depending upon the value.

Flesh tones among the seven portraits consisted primarily of lead white, combined in the Cadwalader portraits, with iron oxide red, iron oxide yellow, and bone black. In the later Bayard portraits, vermilion, iron oxide yellow and bone black were mixed with the lead white to produce flesh tones. Vermilion was found in the pink cheek of Mrs. Cadwalader of the Family Group, but iron oxide red predominates in the earlier male portraits where perhaps a ruddier complexion was desired.

An interesting recurring feature of Peale's technique for flesh tones, is the use of a specific pigment mixture used consistently as shadow edges, suggesting back lighting of the shaded side of rounded forms. Seen in the facial details of Mr. and Mrs. Bayard, this type of highlight also occurs in some of the earlier Cadwalader portraits. This particular pigment mixture is characterized, even to the naked eye, by large agglomerates of Naples yellow. The Naples Yellow is a little easier to see when viewed at completely crossed polars. We also confirmed the presence of Naples Yellow using X-ray diffraction.

Peale's son Rembrandt, in his Notes of the Painting Room, writes of French Naples yellow "with Vandyke Red or Violet de Mars (which are deep iron oxide reds) it makes a fine mezzotint, which with white, beautifully represents the roundings of flesh."[7]

It is interesting that we see the very specialized use of a similar mixture in Charles Willson Peale's portraits painted over a half century before. As seen in a sample taken from Colonel Lambert Cadwalader, The elder Peale's mixture consists of Naples Yellow, iron oxide yellow, iron oxide red, lead white, calcium carbonate, and a small amount of bone black. Rembrandt Peale's "List of Pigments" is subtitled "Proper for Painting in oil, according to my own experience, and the best authorities."[8] One can speculate that his father is one of those authorities. Even without analysis of the pigment mixture, this particular highlight can be seen with the naked eye, in these, and many other Charles Willson Peale portraits of the period under discussion, and those of later date.

In conclusion, Charles Willson Peale's use of materials and techniques varied little in these portraits, painted between 1770 and 1781. His palette and paint mixtures were consistent during this period as was the structure of one or two layers of paint. We did not observe blackened shadows due to the fading of red lakes, an aspect of paintings of this period which Peale bemoans in his notes and letters. Rather, despite Peale's well known acknowledgements of his occasional technical experimentation he was, in these pictures, a direct and confident painter seldom given to deviation of convention or to rethinking of pictures in progress.

List of Title and Date of the seven paintings by Charles Willson Peale included in the investigation of materials and techniques.

Cadwalader Family Group	1772
Dr. Thomas Cadwalader	c. 1772
Mrs. Thomas Cadwalader (Hannah Lambert)	c. 1772
Colonel Lambert Cadwalader	c. 1772
Mrs. John Dagworthy (Martha Cadwalader)	1771
Mr. John B. Bayard	1781
Mrs. John B. Bayard (Margaret Hodge)	1780

References:

1. Sellers, Charles Coleman, Portraits and Miniatures by Charles Willson Peale, American Philosophical Society, Philadelphia, 1952, p. 29.

2. Miller, Lillian B., editor, The Selected Papers of Charles Willson Peale and His Family, Vol. I, Yale University Press, New Haven, 1983, p. 341.

3. Ibid, p. 87.

4. Ibid, p. 592.

5. American Philosophical Society, Charles Willson Peale Letterbook, Vol. I.

6. Sellers, Portraits and Miniatures by Charles Willson Peale, Introductory Notes, p. 11.

7. Peale, Rembrandt, Notes of the Painting Room, unpublished manuscript, c. 1840.

8. Ibid.

Schmiegel, Karol A., "Encouragement Exceeding Expectation, The Lloyds - Cadwalader Patronage of Charles Willson Peale," Winterthur Portfolio 12, University Press of Virginia, Charlottesville, 1977, pp. 87-102.

PLATE I. CHARLES WILLSON PEALE, FAMILY GROUP, 1772

PLATE II. CHARLES WILLSON PEALE, MRS. JOHN B. BAYARD, 1780

POST-PRINT

THE ANALYSIS OF TWO TRIPTYCHS IN THE ROTHKO CHAPEL

Carl Aufdermarsh June 4, 1988

American Institute for Conservation
16th Annual Meeting, New Orleans, LA

IDENTIFICATION OF THE WHITE EXUDATE

The black form paintings comprising two triptychs in the Rothko Chapel were disfigured by a white substance which exuded to the surface over a period of several years. Microscopic examination of a small sample of exudate revealed it to be a non-living, granular semi-solid which was at least partially crystalline. Energy dispersive X-ray analysis showed the presence of carbon and oxygen or nitrogen. No elements heavier than oxygen were detected. This suggested that the material is a organic substance or a mixture.

For further analysis about 20 mg. of the white exudate was collected by mechanically lifting it from the surface. It was purified by dissolving in cyclohexane and filtering to remove dust and dirt. The filtrate was evaporated to leave a colorless, soft waxy residue which partially crystallized on standing for several months at room temperature.

Thermal analysis by differential scanning calorimetry revealed a broad crystalline melting endotherm between 40 and 50° C and a heat of fusion of 23 cal/g.

The microscopic infrared spectrum closely resembled that of several saturated fatty acids. Fatty acids are long chain aliphatic compounds with a carboxylic acid function at one end. The four fatty acids with the closest melting points are lauric, myristic, palmitic and stearic. Their reported heats of fusion are about twice that of the white exudate. This suggested that only about half of the exudate is crystalline fatty acid. The remainder was tentatively identified as an ester because of the presence of a characteristically intense carbonyl band at 1740 cm^{-1}.

Gas chromatography and mass spectrometry provided more definitive information. The gas chromatogram was surprisingly simple with only three peaks present in the molar ratio of about 5/1/5. Each of these peaks was analyzed individually in the mass spectrometer and identified by comparing its cracking pattern with that of a reference compound. They proved to be palmitic acid, stearic acid and bis-(2-ethylhexyl)adipate. The latter is a common ester plasticizer with an infrared band at 1740 cm^{-1}.

The structural assignments were confirmed by chemical ionization mass spectrometry which also confirmed that these three compounds were the only volatile materials present in the white exudate. Its composition was calculated by multiplying the GC molar ratios times the respective molecular weights and normalizing to 100%.

COMPOSITION OF THE WHITE EXUDATE

Compound	Weight %
Palmitic Acid	38
Stearic Acid	8
bis-(2-Ethylhexyl)adipate	54

SOURCES OF THE WHITE EXUDATE

Rothko is known to have used whole eggs to make his egg/oil emulsion paint. The fatty acids most likely came from the egg yolks which contain about 25% fat as a mixture of fatty acid triglycerides. The saturated fatty acid portion of these triglycerides is reported to be mostly palmitic acid with some stearic acid. These acids are formed by hydrolysis of the glycerides after the paintings were installed. The gradual migration of these acids to the surface was accompanied and perhaps assisted by the adipate plasticizer. Several other factors may have contributed to these processes. The paintings were not sealed with any varnish. They had been installed in the very high humidity of a new building with fresh concrete. Moisture from this environment would diffuse readily into the paint where it could interact with the triglycerides. The hydrolysis reaction may well have been catalyzed by caustic aerosols from the fresh concrete, a phenomenon described by Japanese workers. The fatty acids so-formed could slowly diffuse to the surface where they could crystallize unimpeded by any varnish.

The source of the bis-(2-ethylhexyl)adipate is more problematical. It is a common plasticizer widely used in certain plastics and some paints. We suspect that it was introduced in the acrylic medium or the paint formulation but have been unable to verify this.

CLEANING SOLUTION

A solvent mixture was formulated to remove the white exudate from the paintings. It consisted of a mixture of 25 volume% cyclohexane in "Freon"-113 (1,1,2-trichloro-1,2,2-trifluoroethane). It was chosen for the following reasons. Cyclohexane is an effective solvent for the white exudate but is unlikely to attack the paint. However, it is highly flammable.

"Freon"113, on the other hand, extinguishes fires under ordinary conditions but is a relatively poor solvent. A 1/3 mixture of the two proved to be less flammable yet quite effective as a solvent. It was mild enough to be used repeatedly without fear of damaging the paint. The mixture is convenient to work with but volatile enough to evaporate quickly after the cleaning operation. Its toxicity is low and flammability is greatly reduced by the presence of Freon. Finally, both solvents are readily available at reasonable prices.

Conservators at the Menil Collection used the solvent mixture to clean the white residue from Rothko's black-form paintings. The highly successful restoration procedure as well as a historical review of conservation activities in the Rothko Chapel will be the subject of a future paper by Carol Mancusi-Ungaro.

CONCLUSION

The whitening problem discussed here is hardly unique. Whitening or "blooming" is a common, if not ubiquitous, phenomenon with a no doubt varied etiology. Nevertheless it is tempting to suggest that the mechanism described here should be suspected in any case of a whole egg tempera painting with a whitening problem. If this hypothesis is correct, the solvent and cleaning technique described here should find broader application in the future.

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Schlumberger Well Services

ANALYSIS AND TREATMENT OF THE GORDON FAMILY, c. 1760 BY HENRY BENBRIDGE

by Mark F. Bockrath*

The American portrait painter Henry Benbridge was born in Philadelphia in 1743. Benbridge's father died in 1751, and his mother, Mark Clark Benbridge, remarried Thomas Gordon, a wealthy Philadelphia merchant of Scottish descent, in the same year. Thomas Gordon was very supportive of his stepson's art career, and Henry grew up in an unusually wealthy environment for an American artist. When he received his inheritance in 1764, Benbridge travelled to Italy. In Rome, he received instruction from the rival teachers Anton Raphael Mengs and Pompeo Battoni, and copied from the Old Masters. In 1769 Benbridge studied in London with Benjamin West, who was a distant relative of his. Benbridge was one of the few American painters of the 18th century who was wealthy enough to be able to take advantage of such training.

Benbridge returned to Philadelphia in 1770, and moved to Charleston, South Carolina, in 1773. He painted miniatures as well as individual and group portraits. Benbridge moved to Norfolk, Virginia, in the 1790's. He died in Philadelphia in 1812.

The Pennsylvania Academy of the Fine Arts recently acquired a portrait by Benbridge of his mother's and stepfather's combined families from a private owner (figure 1). The portrait, measuring 66" x 74", is unsigned and undated, but was probably painted about 1762, when Benbridge was 19 years old, and before his trip to Italy. Art historian Robert Stewart, in the catalogue to an exhibition of the artist's works at the National Portrait Gallery in 1971, identifies the sitters as Thomas Gordon at the left, Mary Benbridge Gordon seated at right, Gordon's daughter Dolley by his first marriage standing behind her father, Thomas and Mary Benbridge Gordon's young children Ann and Thomas, Jr., standing next to their parents, and their baby girl, Frances, at center.1 Mr. Gordon is seated in an elaborately carved Philadelphia Chippendale chair which attests to his wealth. A chair of identical design is part of the collection of the H.F. DuPont Winterthur Museum (#G59.1327). Mrs. Gordon is seated in a Philadelphia Queen Anne chair.

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Large scale group portraits are rare in colonial American painting, especially in the Middle Atlantic colonies in this period. Perhaps the best known 18th century group portraits are John Smibert's Bermuda Group of 1729 (Yale University), and Robert Feke's Isaac Royall Family, c. 1741 (Harvard Law School). The less formal poses of The Gordon Family, however, reflect the later Georgian rococo development of the "conversation piece", in which figural groups adopt more relaxed gestures in compositions often set out of doors, as in Joseph Blackburn's Isaac Winslow and Family of 1755 (Museum of Fine Arts, Boston), or John Greenwood's Greenwood-Lee Family Group of 1747 (Shattuck Collection).

Stylistically, the strongest influence on Benbridge's early work was John Wollaston, who worked briefly in Philadelphia in 1758. Wollaston's portrait of Thomas Gordon (Collection of Gordon Saltar), painted at this time, may have been commissioned by Gordon so that young Henry could observe Wollaston's technique.

When The Gordon Family was examined for acquisition, it was found that it had undergone a considerable amount of restoration. A label on the reverse of the work showed that in 1936, Hannah Mee Horner of Philadelphia restored the work, mounting it to plywood with animal glue, and extensively overfilling and overpainting the small paint losses and extensive traction crackle in the painting. The painting was coated with a thick layer of very discolored natural resin varnish. Little improvement of the surface of the painting could be achieved by removal of the plywood, so it was decided to limit treatment to removal of the discolored varnish, overpaint and overfilling. Ultraviolet light examination revealed most of the overpaint, much of which was concentrated on a horizontal line through the center of the painting where the two pieces of the support fabric were seamed.

As can be seen in the view of the painting before treatment (figure 2), a figure of a servant was also present in the right background. This figure proved to be a complete fabrication on the part of the restorer. In the National Portrait Gallery catalogue, the servant is identified as Mr. Gordon's slave Caesar. Caesar was painted over cracks in the original paint, many of which had been filled with the same glue and chalk mixture present in other areas of restoration. The shadows in the figure contained artificial ultramarine blue, and his collar contained zinc oxide; both pigments were not in use until the 19th century.

Curiously, an article by Charles Henry Hart entitled "The Gordon Family" in the June 1918 issue of Art in America shows a photograph of the painting without the servant.2 The photo shows the painting to be buckled and probably unlined. While the article was cited in the National Portrait Gallery catalogue, it was not noted at that time that another figure had appeared in the composition since 1918.

Why was this figure added to the painting? An x-radiograph (figure 3) of the area revealed that Mrs. Gordon was once placed in the position of Caesar, but was moved to the left by the artist, who overpainted the original image of his mother with landscape. The radiographic image of the area shows that the original Mrs. Gordon was in the same pose as a bust length portrait of her (Collection of Gordon Saltar) painted by Benbridge at the same time.

When the repaint of Caesar was removed, it was apparent that past overcleanings had revealed some of the flesh color of the earlier face. This image was intensified by the texture of the paint, which exhibited extreme traction crackle here, especially over Mrs. Gordon's hair. It appears that Caesar was added to the painting in order to cover abrasion and to mask textural problems. The restorer even used an existing landscape form to fabricate the face, turning a tree branch into a lock of hair on Caesar's forehead.

The surprises offered by this radiograph, as well as the extensive overall traction crackle due to Benbridge's reworking of the design prompted the author to make a composite radiograph of the entire painting. Numerous major changes in the composition were revealed, indicating that Benbridge had a difficult time completing the work. Mr. Gordon and his eldest daughter Dolley were both moved upwards. The younger daughter Ann, who once stood next to her mother, switched positions with Thomas, Jr., who once stood next to his father. A dog in the lower center of the painting was removed, and a parrot was given to Thomas, Jr.. Mrs. Gordon shifted to the left, pivoted somewhat, and received her youngest child, Frances. The earlier figures all appeared to be quite finished, and produce stronger images on the radiographs than do the revised figures. The radiograph also reveals that the painting was cut down several inches along the top and bottom edges, and that the original stretcher was little more than 2 inches wide. Since the 1918 Art in America article gives the same dimensions for the painting as its present ones, the painting must have been cut down and restretched before that date.

Examination of the cracks in the paint film under low magnification revealed many of the lower layers, and also showed that Benbridge covered many parts of the earlier design with a dark yellow paint film before applying the upper layers. In some areas the layering is very complex. In the upper background, for example, greenish-blue paint layers are found below yellow and brown ones, suggesting that a greenish-blue drapery may lie below the present brown wall.

When all of the repaint had been removed, the extensive overfilling by the restorer became apparent. This hard substance was removed as far as was practical by mechanical means so that it would not present an objectionable flat texture. The painting was revarnished with brush coats of Acryloid B-72 in xylene

followed by Winton's Picture Varnish. Inpainting with Bocour Magna colors was followed by a spray coat of Winton's Picture Varnish and a final protective spray coat of B-72.

Before inpainting, pigments were sampled for identification by polarized light microscopy. Benbridge's palette and technique were simple. Though he employed glazes after his studies in Italy, the technique of The Gordon Family is a direct one. The support is a finely woven linen fabric of plain weave construction with a thread count of 42 threads per inch in the vertical direction, and 30 threads per inch horizontally. The white oil ground consists of white lead and a white inert pigment, with a small amount of earth yellow and black. The design colors included white lead, Prussian blue, yellow, red and brown earth colors, vermilion, organic red lake, and black, probably bone black.

Color mixtures were generally simple. The principal colors used in Mr. Gordon's face were white lead, vermilion and yellow earth. Mrs. Gordon's dress highlights were white lead and yellow earth. Dolley's red dress was a mixture of red lake, yellow earth and vermilion, with some white lead and black. Ann's blue dress was modelled with white lead, Prussian blue and black. Her red shoes were painted with vermilion and red lake. Thomas Jr.'s liver-colored coat consisted of white lead, red lake, vermilion, earth colors, Prussian blue and a small amount of black.

The dark yellow color with which Benbridge blotted out many earlier figures before repainting them consisted of yellow earth, black and a white inert.

In the background, the brown wall contained mostly brown earth with some red and yellow earths and black. The early evening sky was white lead, earth yellow and Prussian blue. The green trees consisted of Prussian blue and earth yellow, with some white lead and black.

Acknowledgements:
The author would like to thank the conservation and curatorial staffs of Winterthur Museum for their assistance with this project, as well as Mrs. Eleanor Quandt for her discussion of Benbridge's techniques, Lydia Dull of the Intermuseum Laboratory for advice on x-radiography, and Rick Echelmeyer for photography.

FOOTNOTES

1. Robert G. Stewart, Henry Benbridge (1743-1812): American Portrait Painter (Washington, D. C.: Smithsonian Institution Press; for the National Portrait Gallery, 1971)

2. Charles Henry Hart, "The Gordon Family: Painted by Henry Benbridge", Art in America, vol. VI, number 4 (June 1918), pages 191-200.

Fig. 1 Henry Benbridge, The Gordon Family. After Treatment.

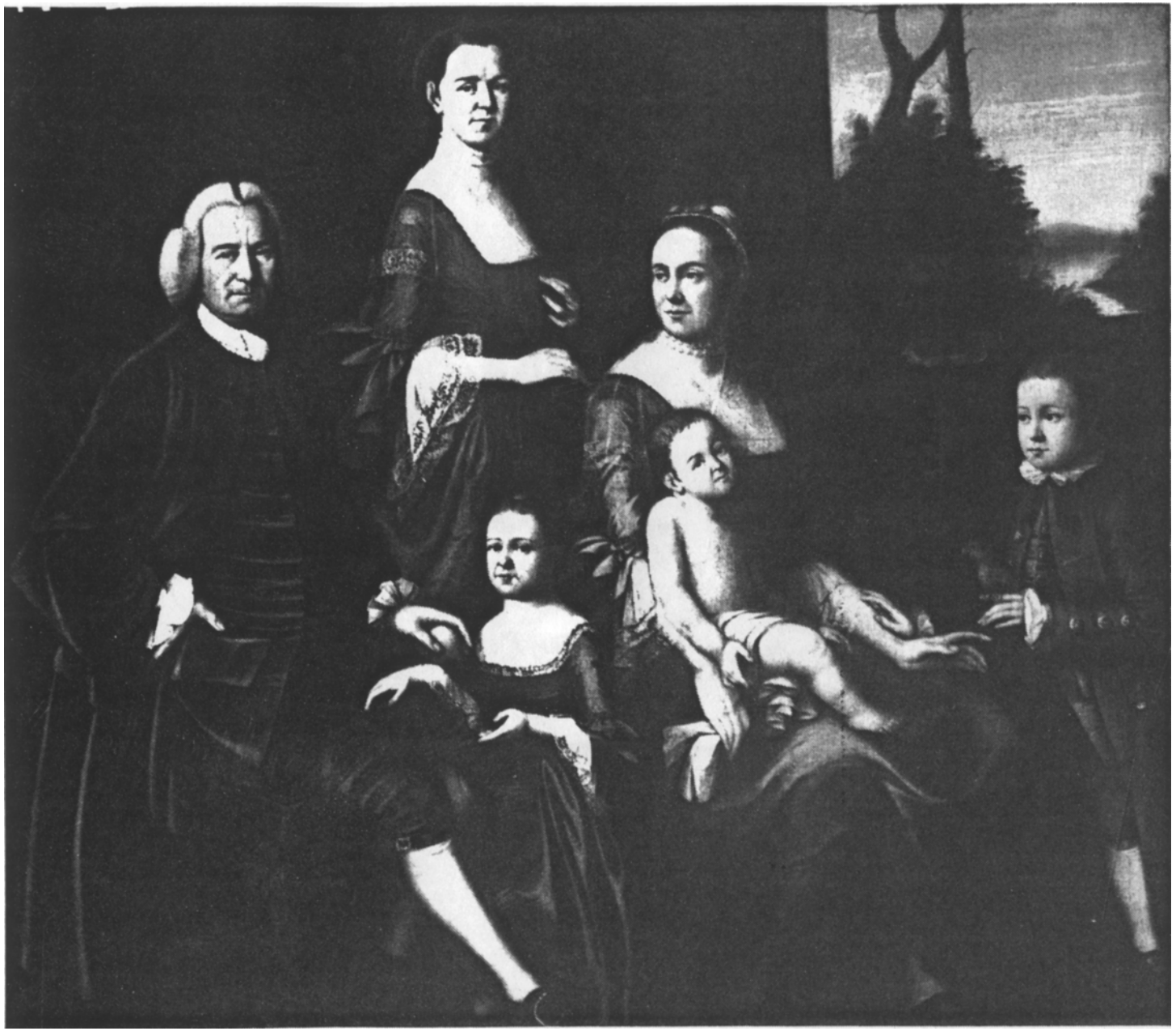

Fig. 2. Henry Benbridge, The Gordon Family. Before Treatment.

Fig. 3. Henry Benbridge, The Gordon Family. X-radiograph.

SARGENT'S MRS. CECIL WADE, SOLUTIONS TO COMPLEX TREATMENT PROBLEMS

by Scott A. Heffley*

Abstract:

This paper will discuss the painting treatment, including a method used to successfully treat 60 year old paint blanching. Special lining considerations were required to protect the surface characteristics of high, isolated peaks of delicate impasto and large, thinly painted areas of solvent and heat sensitive paint. A moisture treatment and "drop-lining" techinque developed for conventional equipment was used in the lining of this large canvas, 66" x 54".

Introduction:

John Singer Sargent's Mrs. Cecil Wade was painted in 1886 when the artist was 30 years old and the sitter was 23. This large, full length, three quarter sized work shows the sitter in profile, wearing the white evening gown in which she was presented to Queen Victoria. She is seated in a softly rendered music room with window light glistening across a highly polished floor.

The work is somewhat pivotal for Sargent's career because it is probably his first major portrait commission in England, having just moved there in that year. Two years earlier in France his portrait of Madame X (Madame Gautreau) met with scandal and his social commissions reduced considerably. At that time Sargent was faced with the decision of continuing along the line of bold forward portraiture as in Madame X and risking his livelihood, or returning to his more accepted social style. He chose the latter and Mrs. Cecil Wade provided a beautiful entry into English social circles.

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The painting remained in the sitter's family, virtually unknown to the art world, until May of 1986 when it sold at Sotheby's auction setting a record price for the artist.

Condition:

During the 100 years it remained in England at least one overzealous conservation treatment, probably prior to 1926, left the painting with extensive paint blanching, numerous tears and badly cropped on one side. Because of the cropping on the bottom, the painting design crosses the bottom stretcher member to form the bottom tacking edge. The horizontal stretcher member is now below center and the side stretcher members had been cut at the bottom and rejoined to the bottom stretcher member. Assuming that the horizontal cross member had originally been centered, the painting has lost approximately 6 1/2" from the bottom. Although there is no tacking edge along the right side, it seems that little painting had been cropped there.

The canvas is a very fine linen that is more suitable for a painting smaller than Mrs. Cecil Wade's 66" x 55". The painting has been strip-lined with wax and there are wax-attached patches behind seven canvas tears. The strip lining and patches have resulted in bulges in the picture plane. Also stretcher member creases have formed in the canvas outlining both cross members.

The paint has been thickly applied in the figure area with high isolated peaks of delicate impasto throughout the dress. This thick lead white paint in the dress is badly cupped in most areas. The background, by contrast, is an interlayering of thin resinous glazes which allows the fine canvas texture to show through. No paint cupping is apparent in the background. This sharply divides the painting into two zones: the thickly painted predominately lead white figure and the very thinly glazed resinous background. No solvent sensitivity in the moderate to weak range is apparent in the figure, but there is sensitivity to these solvents in the background.

Extensive and severe paint blanching has occurred in the dark greens of the background in the right half of the picture. The blanching is beneath the old yellowed varnish and imparts a milky gray appearance to the paint. Wetting with solvent after test varnish removal did not saturate the blanching. Paint abrasion from previous cleaning was found in the background around the figure.

A thick uneven yellowed layer of natural resin varnish covers the painting.

Treatment:

Varnish removal:

Old varnish was removed from the figure using a mixture of Stoddard's

Solvent, isopropyl alcohol and acetone, 3:2:1. Residual varnish and staining left from previous cleanings were removed with acetone. The varnish was removed from the background with a mixture of Stoddard's Solvent, isopropyl alcohol and acetone, 9:2:1, or by alternating use of the two mixtures.

Blanching Treatment:

Numerous techniques and solvents were tested in the hope of reforming this blanching. Vapor phase methods were rejected because exposing the entire painting to a strong procedure was not warranted when only part of the painting needed such a treatment. Also at that time our conservation lab was not equipped with the proper safety equipment necessary to handle large quantities of toxic vapors. The selected method involved first the application of damar varnish in Stoddard's Solvent and turpentine, 2:1. (This alone had no effect on the blanching.) Then after seven hours drying time, Cellosolve (ethylene glycol monoethyl ether) was brushed thinly, without rebrushing, over the damar. Varnish applications after this treatment showed a nearly complete elimination of the old paint blanching. It should be noted that before final varnishing with Soluvar gloss and matte, 2:1, in benzine 264, the damar coating was thinned but not completely removed because of an encountered paint sensitivity.

In order to suggest a mechanism involved in this treatment the physical nature of paint blanching should first be considered. Paint blanching is many minute "air pockets" within the paint film. Areas of non-polymerized material, medium and possibly pigment have been leached from the paint matrix during previous over cleaning or chemical action. As light travels through the paint, it refracts differently at the junctions of the medium and the "air pockets" and the appearance is a hazy milky look.

The "air pocket" network of Mrs. Cecil Wade's blanching must have been sealed at the surface of the paint because wetting with small molecular weight solvents did not fill the holes and saturate colors. Damar varnish was chosen for this treatment because its molecular weight (which can be related to molecular diameter) is much smaller than any synthetic varnishes, approximately 400 compared to over 10,000 for AYAC and larger for Acryloid B-72 or B-67. Damar was applied to the surface followed by the application of Cellosolve. The Cellosolve was used to swell both the paint film and the damar layer. This would open the "air pocket" network and allow the damar to fill voids before the Cellosolve evaporated and the paint film would shrink back. It is likely that some chemical interdiffusion of the paint and damar layers had occurred during the reforming process, hence the encountered paint sensitivity during the damar removal.

Moisture treatment:

Before any moisture treatment was begun, the painting was prepared for lining. This involved: removing it from the stretcher; removing the strip-lining and patches; extracting wax from the strip-lined and patched areas of the painting; repairing tears and leveling the canvas reverse.

Pronounced lead white paint cupping, stretcher member creases and surface distortions were then greatly reduced through a heat and vapor treatment on a standard 5′ x 8′ vacuum hot table. This involved placing the painting face up on a double layer of Fiberglas fabric that had been previously misted with a mixture of distilled water and ethanol, 4:1. The vacuum was 2" mercury and the tabletop temperature was 95-100°F for 1 1/2 hours. The hot table was cooled and the Fiberglas layers were exchanged for a triple layer of fresh ones. The vacuum was returned to 2" mercury and the tabletop temperature was 95-100°F for 1 hour. The final drying was accomplished under a felt cushioned weighted board on top of butt-joined blotters.

Fiberglas fabric is used as the moisturizing layer rather than blotter or newsprint for several reasons. The Fiberglas material has no affinity for moisture and an open weave structure. This permits the moisture to vaporize and evenly migrate to the painting. The Fiberglas weave is even and cushioning compared to the uneven texture and possibly warped structure of moist blotter. Finally Fiberglas comes in wide rolls and is inexpensive.

Drop-lining:

Numerous condition features indicated that an overall, fairly strong lining would be important. The original canvas was too fine and degraded to successfully support this large painting, especially with the heavily applied paint of the figure. Seven canvas tears ranging up to 4 5/8" long had already occurred and the strip-lining and patched tears had led to bulges in the surface plane. A fairly strong lining adhesive would reduce the possibility of returned paint cupping or lining delamination if over time the paint cupping wanted to return in some measure.

Concerns about lining this painting were also numerous. The high isolated peaks of delicate impasto could be susceptible to flattening or moating. The large thinly painted areas of the background could be susceptible to weave enhancement or interference. And the heat sensitive glazes of the right background could melt and ferrotype resulting in an imposed glossyness.

The idea of a drop-lining was expanded to accomodate the lining of this large canvas (66" x 54"). This technique minimized the time of heat and pressure contact that the painting endured to less than 45 seconds and was accomplished on a standard vacuum hot table. A more typical lining on a vacuum hot table would involve over 20 minutes of heat and pressure contact. The drop-lining greatly reduced the possibility of any alterations discussed above.

It should be noted that all paint cupping, stretcher member creases, bulges and tear distortions were addressed in the moisture treatment. The purpose of the drop-lining was solely to attach the painting to a lining fabric. The drop-lining procedure used in the lining of Mrs. Cecil Wade is outlined below:

1. Brushed a coat of working varnish, Elvacite 2044 in benzine 264 onto painting.

2. Faced painting with wet strength tissue using Elvacite 2044 in benzine 264. The facing extended 12" beyond the top and bottom edges of the painting. These tissue extensions were reinforced with another layer of wet strength tissue that extended 1 1/2" onto the obverse of the painting and was also attached with Elvacite 2044. All tissue edges that overlapped on the obverse of the painting were water cut. A varnish facing was chosen over a paste facing because of the blanching history of the paint film.

3. Attached with a warm conservation tool BEVA 371 film to the reverse side of the facing tissue that extended beyond the perimeter of the painting. The film with silicon paper was cut to butt exactly against the irregular edge of the painting and extended 2" beyond. The silicon paper was left attached so that during the lining process the facing tissue or roller would not adhere to the lining adhesive.

4. Designed and had constructed a lining apparatus that would allow the faced painting to be suspended above the adhesive covered lining fabric on the hot table and permit smooth, even lowering of the painting onto the adhesive covered lining fabric during the lining process. Paper facing extensions on the top and bottom of the painting were attached to the two lining apparatus tops using BEVA film. (see Dia.1 and Fig. 2,3)

5. Constructed 57" long foam roller by attaching with contact cement soft 3/8" thick neoprene open-cell sponge to a 3 5/8" outside diameter heavy cardboard tube.(see Dia. 2 and Fig. 4)

6. Removed all slubs and weave irregularities from 39 Terytex 100% polyester lining fabric.

7. Pulled polyester lining fabric taut across hot table and clamped it into position using padded aluminum bars and small "C" clamps along the length of the table. The ends of the fabric were held taut across the table by clamping it beneath the padded bases of the lining apparatus.(see Fig. 2,3)

8. Attached lining adhesive, double layer of BEVA 371 film, to polyester by positioning and heating with a hand iron. Silicon release papers were removed.

9. Heated hot table until BEVA reached an adhesive-active tack temperature (approximately 160^{o}F). Additional heat from hot air guns was used to supplement the table heat around the perimeter of the adhesive area because of temperature dropoff near the edge of the table.

10. After the adhesive had reached the proper tack-temperature, the painting, attached to the top part of the lining apparatus was placed in position on the lining apparatus bottom with the valley of the suspended painting being 8" above the adhesive. (see Fig.3)

11. The foam covered roller was placed across the center of the painting perpendicular to its axis. (see Fig.4) The apparatus ends were lowered simultaneously until the center of the painting beneath the roller made contact with the adhesive. The bond was made between the painting and the adhesive by rolling, in one motion, the bottom of the painting followed by the top. (see Fig.5) After each half was adhered the facing paper attached to the apparatus was cut free.

12. Once attachment had been made, the clamps were quickly removed and the lined painting was moved from the hot table onto an auxiliary table of similar height. The time from when the painting first touched the adhesive to when it was removed from the hot table was less than 45 seconds.

13. As soon as the painting had been moved onto the auxiliary table it was again fully rolled with the large foam roller and a small hand roller to further confirm the adhesive bond.

14. Stretched lined painting onto temporary stretcher that was approximately 6" larger than the painting in all directions. Expanded temporary stretcher by keying outward to provide tension on the painting.

15. Removed facing from painting using benzine 264.

16. The canvas fold line at the bottom tacking edge, the complex tears in the upper right corner and lower right chair as well as a few areas around the perimeter did not completely flatten into the picture plane during this lining procedure. Locally flattened these areas using a warm hand iron or conservation tool after the area had been supported from behind with a platform of glass sheet. The gentleness of the drop-lining technique did not completely flatten the more problematic areas. The reworkability of BEVA adhesive permitted local heating and flattening which led to very satisfactory results.

Conclusions:

The treatment of John Singer Sargent's Mrs. Cecil Wade required solutions to complex treatment problems. Many painting treatments require innovative approaches to their unique challenges. It should be noted that only readily available materials and standard conservation laboratory equipment was used in this treatment. Conservators often use their standard tools in creative ways to deal with the difficult.

Acknowledgments:

The contributions of Forrest Bailey, Joe Rogers and Dan Kushel were greatly appreciated.

DIAGRAM 1: DROP-LINING APPARATUS FOR LARGE PAINTINGS

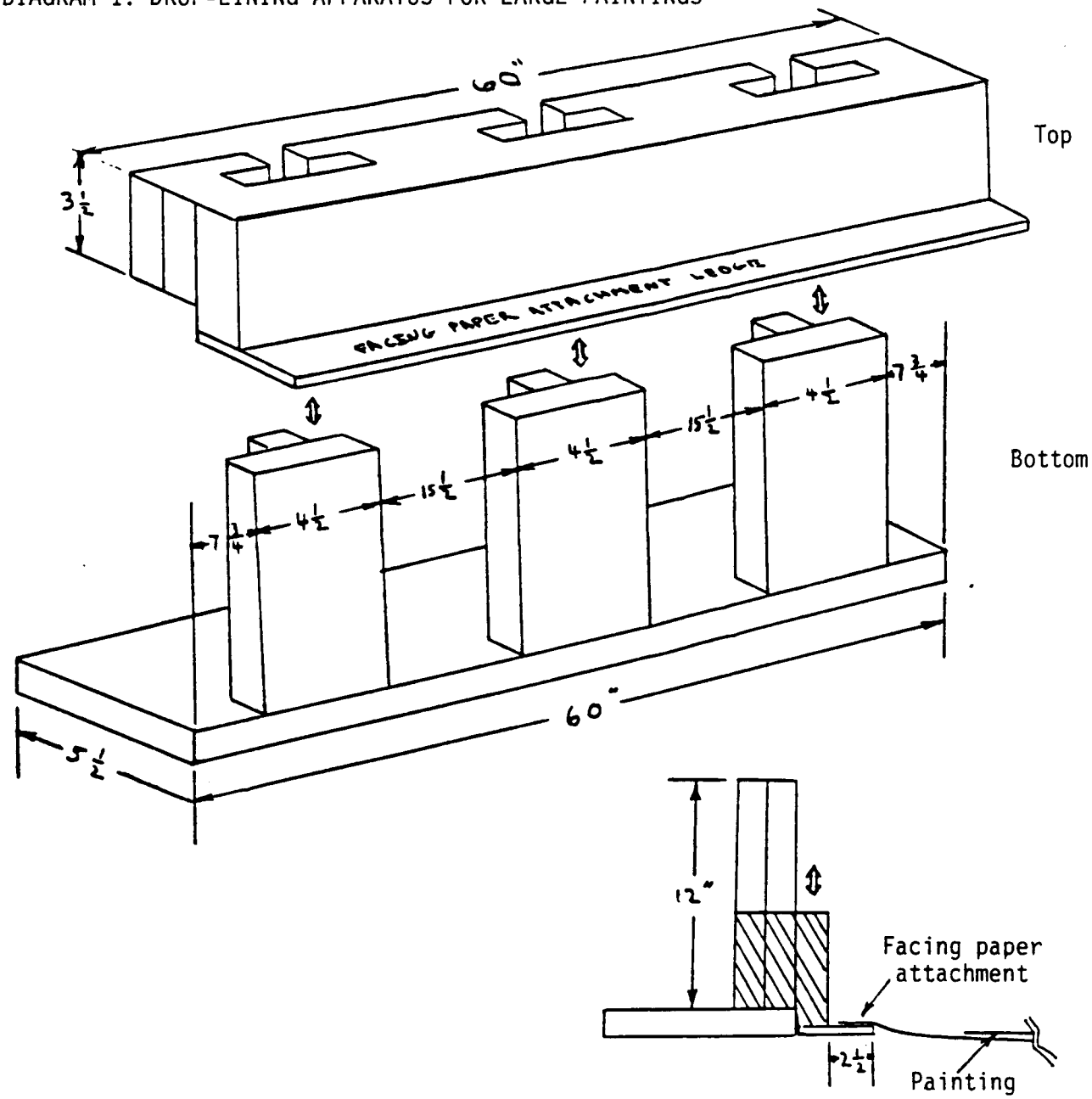
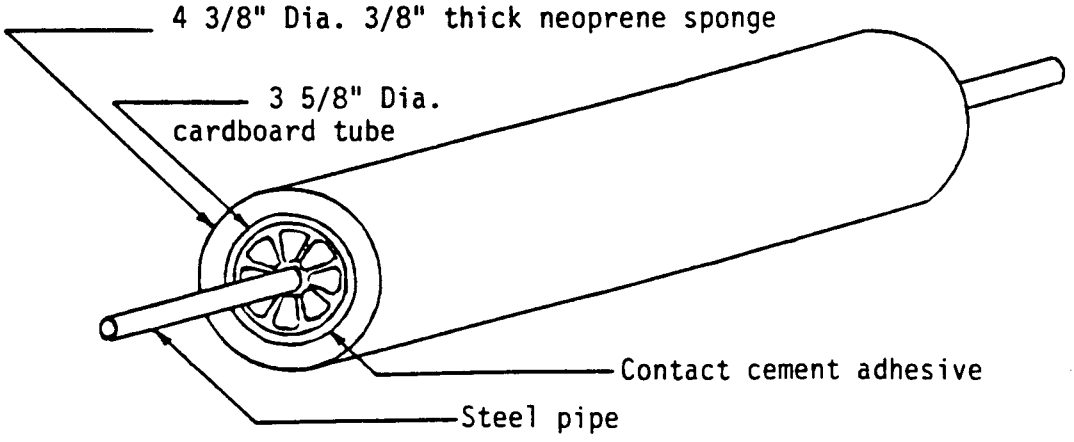


DIAGRAM 2: LARGE ROLLER



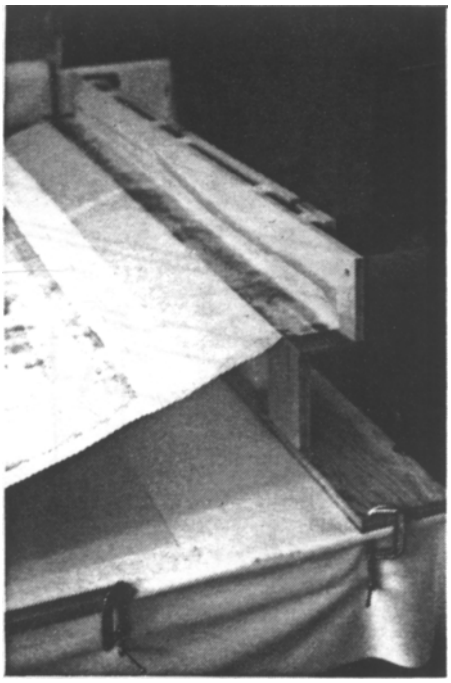


Fig. 2

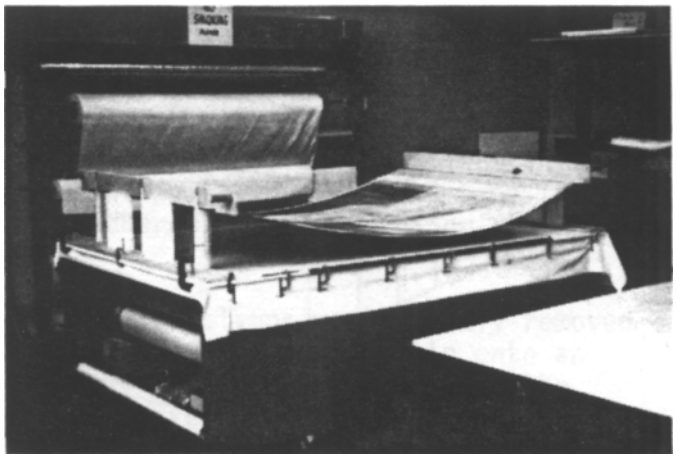


Fig. 3

Fig. 4

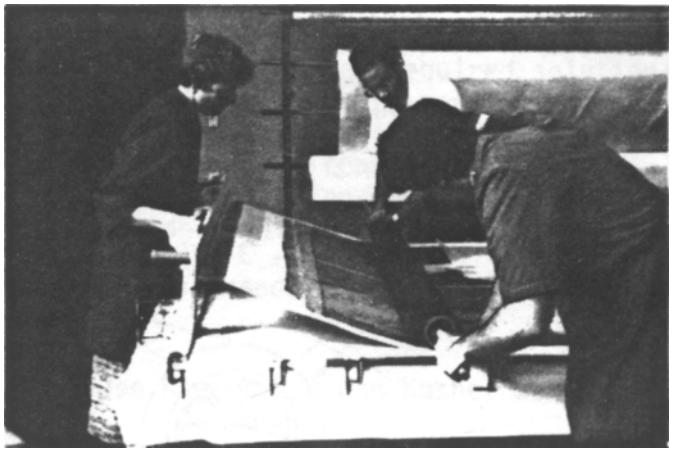


Fig. 5

Fig. 2: Drop-lining apparatus showing facing attachment and lining fabric with BEVA film adhesive

Fig. 3: Painting suspended by facing above standard vacuum hot table

Fig. 4: Drop-lining process beginning, showing use of neoprene sponge roller

Fig. 5: Progression of drop-lining as suspension apparatus is lowered on left

ETHICAL AND TECHNICAL DECISIONS INVOLVED IN THE RESURRECTION AND DISPLAY OF A DOUBLE-SIDED PAINTING BY GEORGE BELLOWS

by Bettina Jessell

The History of the Painting

The painting is a double-sided oil painting on fabric support. One side is a Polo Game, painted in 1910, the other a portrait of Judge Olney, a notable personality of the time, painted in 1915. The two sides are in register, each measuring 48 by 38 inches, but one side is landscape and the other portrait format.

Fig.1 The Polo Game as first painted in 1910.

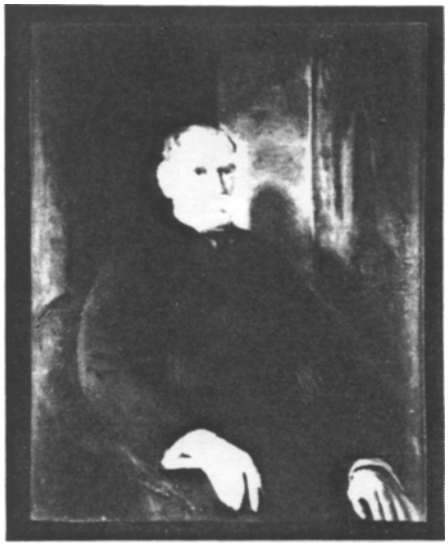


Fig.2 Portrait of Judge Olney, painted in 1915.

The Polo Game.

The history of the painting is unusual, in part explained by the painter's personality.

Bellows was pleased with his Polo Game, one of three versions painted after watching the game at Lakewood. He was deeply interested in sport, a considerable athlete himself, and was delighted with polo as a painting subject - the colours and rapid movement fascinated him. In 1911 he made a number of alterations to the painting, in order to improve the composition and elegance of the spectators in the foreground, and to make the movement more fluid by for instance slimming down the rounded shoulder of the central pla yer, and the rump of the grey horse. He sent the painting to the 106th Annual Exhibition of the Pennsylvania Academy, but it failed to sell, and came back to his studio.

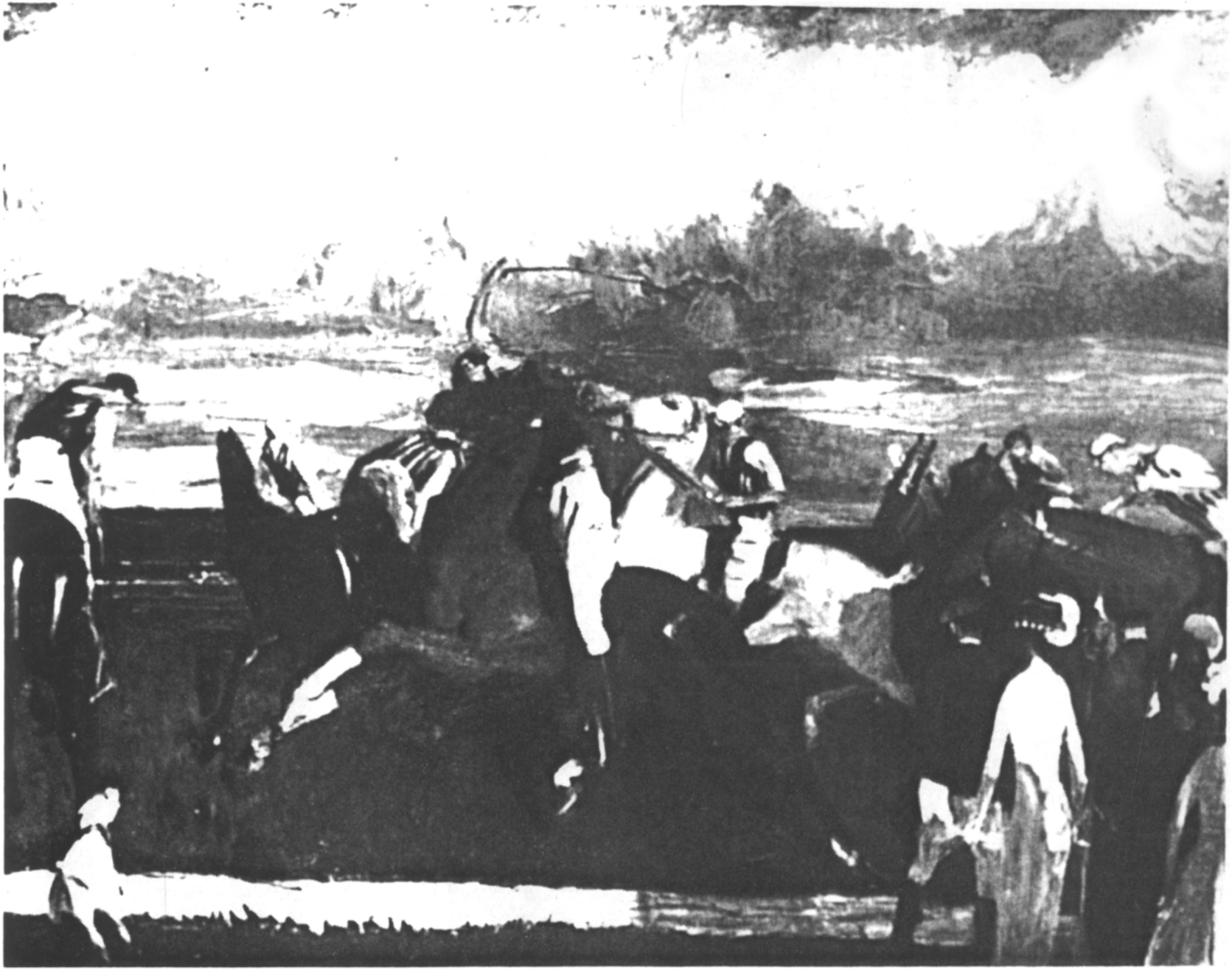


Fig.3 Polo Game from Pennsylvania Academy Exhibition catalogue, 1911.

Between 1911 and 1915, he again altered several passages to improve the feeling for fast movement. In his new style, rounded forms were reduced to even more angular, urgent shapes. Unfortunately, he used blatently unmatched colours and random brush-strokes for the alterations. In his impulsive way he gave up on the whole project, painted the Polo Game out with a thick layer of lead white oil paint, turned the canvas over, and used it for his portrait of Judge Olney, then president of the Harvard Club. It was an important commission for the club, and it seems a little odd that he should have used an old canvas.

Fig.4 Final version of Polo Game, with unmatched colours and random brush-strokes.

Judge Olney.

Both men, painter and sitter, were alike in being fond of their own way. Judge Olney was used to much power, and took it for granted that he would choose the style, composition and colour of his portrait. There was antagonism, and perhaps in consequence Bellows painted a more aggressive and harshly coloured portrait than he might have done for a more sensitive sitter. The colour scheme was abetted by his new enthusiasm for the paint manufacturer Hardesty Maratta's somewhat regrettable theories of colour. At about the same time Bellows became committed to a theory of composition invented by Jay Hanbidge called Dynamic Symmetry, a curious rigid triangu-

lation. Both theories had a confusing effect on Bellow's marvellous instinctive genius of the earlier years. Painting theories abounded at the time, possibly a defense against the shock of Impressionism at the Armory Show.

Fig.5 Bellows: The Picknic. Example of composition according to Theory of Dynamic Symmetry.

Not surprisingly,the portrait did not conform to the conventional ideas of the Harvard Club, the Committee rejected it, and it came back to Bellow's studio, and stayed there until his tragic early death.

The Previous Conservation Treatments

The painting was eventually sold to a collector, who had the resolution to attempt to have the Polo Game revealed. It was known that there was such a painting on the back of the portrait, and further information came from Bellow's meticulously kept studio book. There is a delightful thumbnail sketch of each painting, but unfortunately, for copyright reasons, it cannot be shown here.

The painting was sent to New York for cleaning, where most of the lead white layer was removed, and also much of the paint layer. As a result, the three versions of the Polo Game described were now revealed. Now simultaneously visible was a confused group of early and later figures of spectators, some plain and some elegant, and the three different versions of the central player's shoulder and the rump of the horse, rounded and slimmed down.

The paint layer was in a sorry state of extreme abrasion, with the ground showing through like a veil of dull white dots except in passages of extreme impasto. There were also flecks of brilliant white, residues of the lead white layer in the hollows of the impasto and the interstices of the canvas, and some flaking damage.

The painting was sent to be further restored locally. It was strip-lined, and mounted on a wooden mortise and tenon stretcher, Polo Game upwards, so hiding some of the portrait. The Polo Game was then all but covered with translucent acrylic glazes to obscure the abrasion.

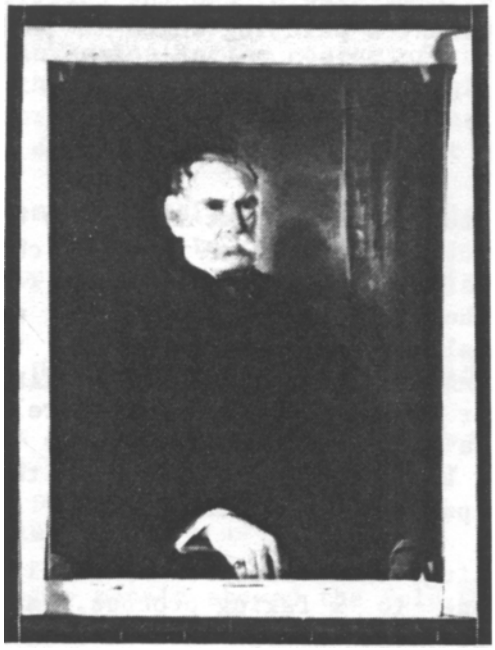


Fig.6 Portrait partly hidden behind stretcher.

Fig.8 Detail of Fig.7 showing grey dots of abrasion and white flecks of lead white.

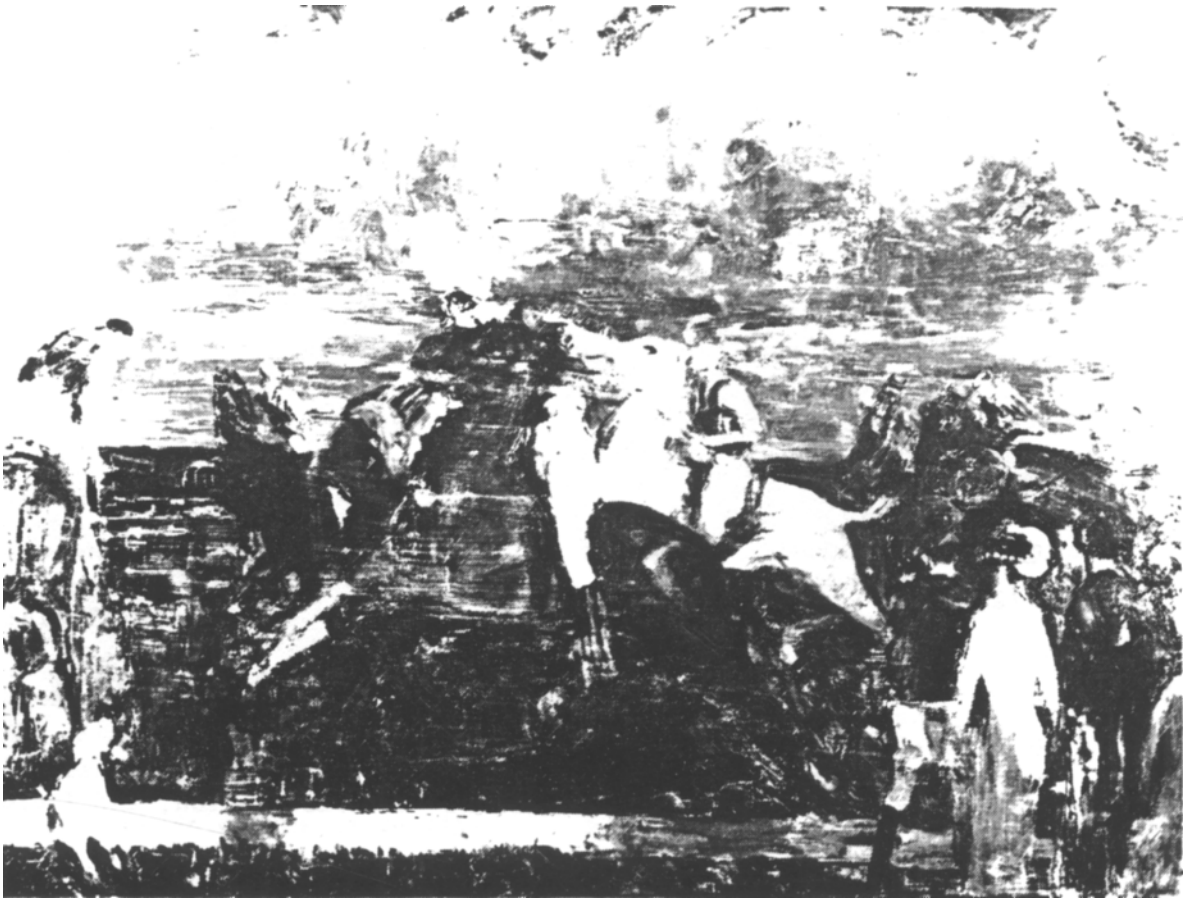


Fig.7 Condition of Polo Game after lead white layer had been removed.

At this point the painting was sent to my studio, and the question had to be considered: is it ethical to resurrect a painting which the painter has discarded?

To Restore or not to Restore

I often find the ethics of whether to undertake, or refuse to undertake, the restoration of a painting a problem. There are the easy cases. For instance, when the quality of the painting is so poor that it would be unfair to advise the owner to spend the money, unless there is overriding sentimental value. Or a tactful refusal may be necessary when the owner cannot be relied on to let the restorer's judgement be final in the treatment of the painting. As a matter of fact I find that the relationship between owner and restorer is rarely a problem. If the restorer makes it clear that his or her loyalty has to be to the painter, and to the painter only, most owners realize that their painting will benefit.

The difficult cases include the paintings that are so seriously damaged that a matched inpainting comes close to a faking process. Many English Tudor and Spanish Colonial paintings come under that heading. The age, quality and perhaps the historical importance of the painting then has to decide whether a restoration is justified, or whether perhaps to compromise by only carrying out the structural work to preserve the painting.

Fig.9 Typical condition of English Tudor painting.

Fig.10 Typical condition of Spanish Colonial Painting.

Fortunately, in the case of the Polo Game, the decision to clean off the lead white had been taken before I became involved. All I had to make up my mind about was whether to undertake the restoration, and I did not find

that very difficult. I liked the Polo Game very much, thought it an important painting, and the nature of the damages was not such as to require too much invention in the course of the restoration. Having gone at some length into the reason why Bellows had given up on the painting, I felt that if a Mozart sonata which the composer had thrown away had come to light at a later date, I would not be purist enough to refuse to listen to it.

It seemd that Bellows' cause would be best served by restoring both sides of the painting to the best of ones ability, and by finding a way to display both paintings in their entirety.

Some Unusual Aspects of the Restoration

It was found that the fabric support, a medium weight, basket weave linen canvas had remained astonishingly sound, no doubt well protected by the three paint layers. In contrast, the tacking edges had become weak and brittle.

The x-ray mosaic showed the Polo Game very clearly, including the known and some unsuspected early alterations. No trace can be found of the portrait, inspite of the fact that it has a thick paint layer, and that of the Polo Game is in places worn extremely thin.

The portrait has a series of nine very deep holes, like pin-pricks, made into the wet paint layer all around the sitter's head, perhaps a technique of Dynamic Symmetry composition?

Fig.11 Detail of head of Judge Olney showing pin-pricks.

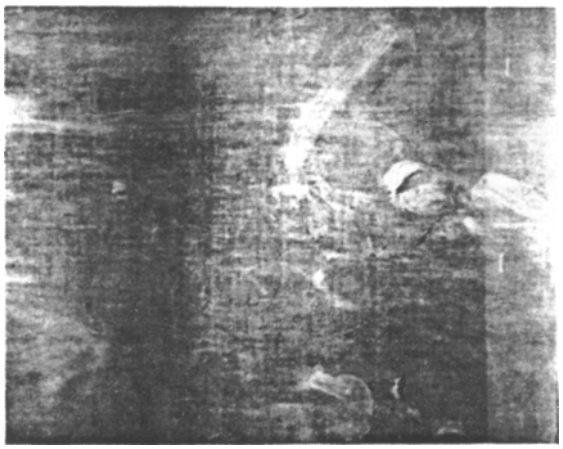


Fig.12 Detail of radiogram mosaic. showing early change but no trace of portrait.

The sky of the Polo Game as received was a curious violet colour, very un-

like Bellow's usual strong sky blues, and totally out of colour harmony with the rest of the painting. Testing showed that the overpaint glazes were in fact a quite well-matched blue, and it became clear that this was a striking example of the turbid medium effect.

Bellow's sky was blue, the restorer's glazes were blue, but they had been applied over a network of white abrasion. A translucent dark glaze applied over a light passage will appear warmer in tone than the glaze's true colour, in this case shifting from blue to violet. Conversely, a light glaze over a dark area shifts towards blue. All inpainting, except when applied in the most covering media, has consciously or unconsciously, to take account of this shift. Cleaning off the overpaint revealed Bellows' sky blue and the white abrasion.

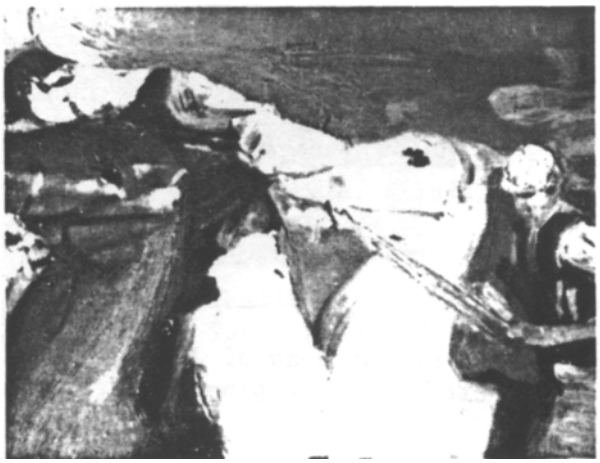
All overpaint was now removed, and the true condition of the painting was discovered (see Fig.7).

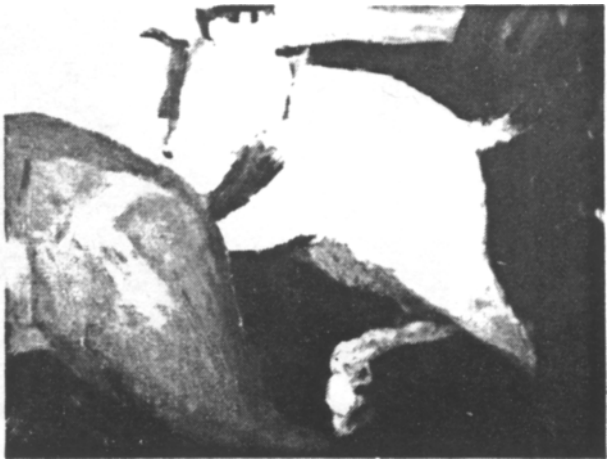
Inpainting Decisions

The interesting part of the inpainting of the Polo Game was the clarification of the passages where the early versions of the painting had been revealed.

Bellows had painted, as it were, three paintings: the original 1910 version, the Pennsylvania Academy version, and the final version with the unmatched colours and random brush-strokes. Which one should one accept? Not the earliest, because he preferred the second. Perhaps the Pennsylvania version because he liked it enough to exhibit it, and only changed it again because it had not sold; or the last version, because it conforms to many of his later solutions to depicting movement.

A course between the Pennsylvania and the last version was adopted after much thought and discussion, in the hope of achieving a solution in harmony with the whole painting.





Figs.13 and 14 Details of Polo Game after completed treatment.

The Display of the Paintings

The aim was to show the full sight size of either painting at will. There was no realistic hope of displaying both sides simultaneously, perhaps in a double-sided frame on a pedestal, or hinged to a wall, because of the different format of the two sides. Theoretically a piece of machinery could have been designed to turn the painting by 90 degrees, but it would have Leen cumbersome and unsightly in a private house. Moreover, it was considered highly desirable to use the existing Whistler frame.
A structure was devised, adapted from Barry Bauman's elegant solution to a similar problem. (See 'A TECHNIQUE FOR STRETCHING AND FRAMING A DOUBLE-SIDED CANVAS' by Barry R. Bauman. 10th AIC Meeting at Milwaukee in 1982.)

Figure 15 shows a section through this structure.

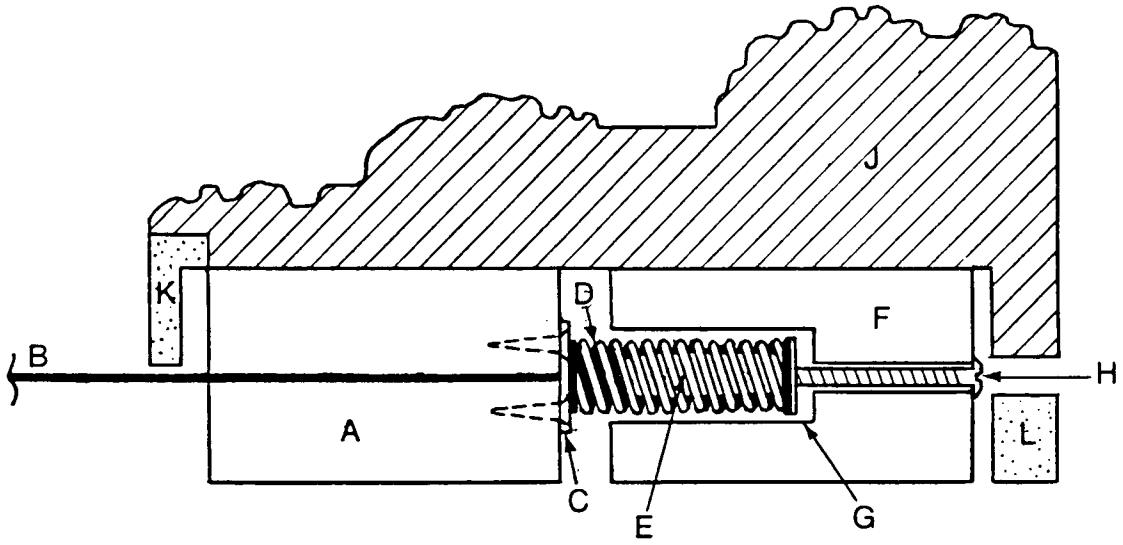


Fig.15 Section through stretching structure.

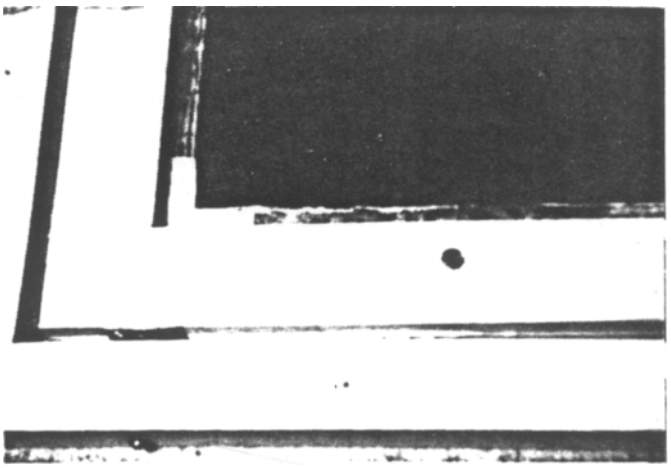


Fig.16
Detail of stretching structure showing stretcher, expansion space, support frame, and position of tension mechanism.

A split stretcher [A] was made, (called 'liner' in Bauman's paper), consisting of a top and separate bottom half, each mitred but not fixed at the corners. The painting [B] was positioned on the bottom half, and the tacking edges were stapled on. The top half was firmly screwed to the bottom, and from then on the two act as one stretcher, with the painting held firmly between. All four stretcher members are capable of moving outwards.

A total of eighteen tension mechanisms was srewed to the edges of the stretcher. Each consists of a small rectangular brass plate [C] bridging the split, with a 1/2" long coil spring [D] welded perpendicularily to its center. Inside the spring is a wall grip [E] with a nut welded to the end.

A strong support frame [F] was made of 1 1/4"x2" wood, mitred and bolted at the corners. It was large enough to allow for a 3/8" expansion space between the stretcher and the support frame. Eighteen holes [G] were drilled into it to house the tension mechanisms. Screws [H] were inserted into the nuts of the wallgrips through suitable holes drilled through the outer edges of the support frame. When the screws are tightened, they pull t he members of the split stretcher outwards, and so make it possible to put the canvas under uniform tension.

The stretched painting and its support frame act as a unit, which can be screwed into the Whistler frame [J], displaying either one or the other painting at will. Further small holes were drilled into the outer edge of the Whistler frame, to allow the tension to be regulated from the outside of the frame. Reversing the painting is a simple job of unscrewing the whole unit from the Whistler frame, and screwing it back with the other painting now displayed.

A gilded shadow liner [K] had to be added to fill the gap between the inner edge of the Whistler frame and the paint surface, caused by the thickness of the split stretcher. Similarily, the gap between the outer edge of the Whistler frame and the wall it is hung on had to be filled with gilded Lengths of wood [L] to hide the support frame.

Acknowledgements

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THOUGHTS ON THE APPEARANCE OF NINETEENTH-CENTURY AMERICAN PAINTINGS

by Lance Mayer and Gay Myers*

The title of our talk is "Thoughts on the Appearance of Nineteenth-Century American Paintings", but perhaps it should be "Thoughts and Many Unanswered Questions About the Appearance of Nineteenth-Century American Paintings": it seems that the more paintings we see of this period, the more we question what we think we know about them.

A good example is a project we began in 1982, to treat a group of paintings by Frank Duveneck, owned by the Cincinnati Art Museum. If we had given a talk about Duveneck's materials and techniques after we had treated ten paintings - which would have been a fairly large sample - we might have made generalizations which we now know are not necessarily true, after having treated forty. So this inability to come to conclusions about artists' techniques is a sort of conclusion in itself.

Another institution recently sent us three landscapes, by John Ferguson Weir, C. H. Gifford and Albert Bierstadt - all painters whose works we had treated before without any out-of-the-ordinary problems. But because of the way each of these three paintings was painted - and the problems differed from painting to painting - all three will look yellower and darker after treatment than the artists intended.

As two conservators who treat many nineteenth-century American paintings, we have noticed that much of the discussion among conservators about the cleaning and appearance of paintings deals mostly with Old Master paintings, or with the special problems of twentieth-century art. But it seems especially important to talk about nineteenth-century paintings because so many are being treated now, and in fact we see a fair number of nineteenth-century paintings which are being treated for the first time.

When we review the literature of nineteenth-century painting techniques, most of us know about Thomas Sully's Hints to Young Painters, but it seems that conservators rarely discuss the part in his book where Sully says that it is a general practice to tone a picture after it is finished. (Thomas Sully. Hints to Young Painters [1873]. Reinhold Publishing Corporation, New York, 1965, p. 37.) In another literary source, Washington Allston describes glazing a finished

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painting with asphaltum, to "lower the tone". (Jared B. Flagg. The Life and Letters of Washington Allston. Charles Scribner's Sons, New York, 1892, p. 187.) And, on the other side of the Atlantic, we know that Reynolds toned his paintings (M.J.F.L. Mérimée. The Art of Painting in Oil, and in Fresco. Trans. W. B. Sarsfield Taylor. Whittaker and Company, London, 1839, p. 334. See also M. Kirby Talley, Jr. "'All Good Pictures Crack': Sir Joshua Reynolds's Practice and Studio." In Nicholas Penny, Ed. Reynolds. Harry N. Abrams, Inc., New York, 1986, p. 67.) and Mérimée, writing in France in the 1830's, describes materials like asphaltum, lac and sandarac as ingredients in varnishes, all of which would have added color. (Mérimée, pp. 45-52.)

It is interesting to note that some arguments which have been cited in past cleaning controversies, mostly as they relate to Old Master paintings, can cut both ways. When Hogarth argues that it is foolish to believe that time and brown varnish improve a picture, he also admits that many artists believed that time and brown varnish did improve a picture. (An Exhibition of Cleaned Pictures (1936-1947). The National Gallery, London, 1947, pp. xx-xxi.) At least some of the early nineteenth-century artists who were applying toning layers may have been intentionally imitating the effects of time.

We recently came across an interesting example of this, in a portrait by Samuel F. B. Morse. The painting had a strongly discolored varnish, but below the varnish we found an intermittent, pigmented toning layer, which appeared to have been rubbed into the hollows of the texture of the paint. This layer had a solubility somewhere between oil and varnish, and it looked very much like what Washington Allston called "Titian's dirt", a mixture of megilp, asphaltum, Indian red and blue, which Allston rubbed on his paintings. (Flagg, p. 187.) Morse was a student of Allston's, and Morse in fact described Allston teaching him how to paint portraits. (Edward Lind Morse. Samuel F. B. Morse: His Letters and Journals. Houghton Mifflin Company, New York, 1914, pp. 75, 436.) Morse also studied with Benjamin West in England. West, when he was President of the Royal Academy, was one of those taken in by an amateur painter who claimed she had discovered a manuscript containing the secrets of the Venetian masters. In a contemporary cartoon, she is shown painting a portrait of Titian, surrounded by members of the Royal Academy. Before long, the manuscript was proven to be a hoax, but not before Benjamin West and others had paid their money and had painted pictures using the alleged Venetian secrets. (See John Gage. "Magilphs and Mysteries." Apollo, vol. 80, no. 29 [n.s.], pp. 38-41 [July, 1964].)

After the discolored varnish had been removed from the Morse portrait, one could easily imagine that the intent of the artist was to make a picture with the look of a dirty Venetian painting. We have treated four other portraits by Morse and none showed signs of ever having had intentionally-applied toning layers, but you can be

certain that whenever we clean a painting of this period we look carefully for signs of "Titian's dirt" or a toned varnish.

In the second half of the century a number of American painters worked in France and brought ideas from the Barbizon and Impressionist painters back to America. There is a hotel in Pont Aven which was decorated from floor to ceiling by the French painters who stayed there, and there is a similar room in an artist's boarding house in Old Lyme, Connecticut, where American painters like Child Hassam and Willard Metcalf did the same thing after they returned from France. We treated all thirty-three of the Old Lyme paintings, and although the American artists lived and worked side by side, there was an almost incredible diversity of styles and techniques. While the cleaning of most of the panels was uneventful, some paintings had varnish layers which were so strongly colored - in one case orangeish and in another reddish - that we felt the added tone could possibly have been intentional and we decided not to remove those layers.

Frank Duveneck is another American painter who spent an important part of his career in Europe, in Munich and later in Italy, and who was an influential colleague and teacher of such artists as William Merritt Chase and John Henry Twachtman. It is our treatment of Duveneck's paintings, above all, which makes us think about the variability of an artist's work. Many of his paintings are painted in a relatively straightforward manner, primarily in drying oil - one of his students described him as painting in a "puddle" of oil. (Josephine W. Duveneck. Frank Duveneck, Painter-Teacher. San Francisco, 1970, p. 70.) Most of his paintings can be safely cleaned. There are some things to throw a conservator off, like deliberately abraded paint - we know that he sanded his paintings with a cuttlefish. (Duveneck, pp. 77-78.) But we have come across five or six paintings out of forty which are different from the rest and which have extremely soluble layers. We have seen bitumen-like underlayers and glazing layers, and mixtures of paint and varnish such as an extremely soluble red in a sitter's hair, or an easily soluble greenish background.

The difficulty of making generalizations, even about an artist whose work we know very well, leads us to a painful conclusion. If we were to publish technical reports on the materials and techniques of, say, ten painitngs by every artist who ever painted, there would be no guarantee that this research would help us when we come to treat the eleventh painting. It could be a sort of historical myopia that makes this seem surprising to us. We like to think that they did things a certain way "in the olden days" and it is difficult to admit that people of the past were as inconsistent and unpredictable as we are.

We have come across a number of cases of the inconsistency of artists' techniques. For example, we have treated paintings by Albert Bierstadt which were not abnormally sensitive to solvents, but we recently had occassion to treat an undoubtedly authentic Bierstadt, the ground and paint of which are, in some areas, easily soluble in toluene.

A private owner once brought us three family portraits, all painted by the same unknown American artist, probably during the 1840's. They had never been treated and have never even been taken out of their frames. One of the three had large parts of the face painted with a varnish medium over a thick layer of varnish. The first touch with a solvent would have taken off the modelling. We often think of that untreated, intact painting when people bring us paintings which were not as lucky, and have been nearly destroyed by cleaning.

A portrait by John Trumbull also showed unexpected solubilities. It was extremely soluble in any solvent mixture which would begin to dissolve the varnish, while other paintings by Trumbull are not. It seems very much like the dammar/oil mixture that Sully recommends in order to have a painting dry quickly. (Sully, p. 26.) We learned that this picture is a copy of another painting, and that it was commissioned as a class gift by the Yale class of 1817. So one theory would be that Trumbull received the commission at the last moment, as students tend to do things, and the painting was done in this unusual technique so it would dry by commencement day.

What should we do about the appearance of paintings with difficult solubility problems? In the case of the Trumbull, the paint was so soluble that it did not seem possible to thin the varnish evenly, so the painting will remain much yellower than the artist intended. Some paintings by Duveneck had been "spot-cleaned" in the past; the varnish had been removed from the lights, but allowed to remain in the mid-tones and darker areas. In some cases there was an awkward imbalance between the cleaned and uncleaned parts, and since it was not possible to clean the darks, we decided to tone the light areas very slightly with a pigmented varnish.

When we are faced with a painting where we cannot clean all of the parts to the same degree, we try to thin the varnish evenly. But thinning can sometimes leave dark accumulations of varnish in the texture of the lights. If this is disfiguring, we may clean these areas more completely to remove the residues and then tone them down by spraying with a tinted varnish, to keep them in harmony with the rest of the picture.

We often see the accidental effects of the materials that artists used. In some of Duveneck's portraits, for example, the highlights in the face can look very white compared to the surrounding flesh, and one cannot help but wonder whether Duveneck used more oil in painting the rest of the face, and this has lowered the tone compared to the final white highlights. In some cases it is exactly the opposite - some highlights will look too dark and yellow. This recalls a still-life painting that Lance painted in his student days - he added copal medium to the highlights, and what should have been the whitest highlights became butterscotch-yellow in only a few months. In cases like these, because they are somewhat random and because we do not always understand them, even though we know Duveneck as well as we do, we usually do not try to

make visual adjustments.

All of these limitations, in our ability to clean some paintings and in our understanding of what an artist intended, can have an effect on the way that conservators relate to curators and owners. For instance, a private owner sent us a painting by John LaFarge for cleaning. It had a discolored varnish, which after much testing we decided we could not remove without risking damage to the paint or compromising the appearance of the painting. The owner contacted the dealer from whom he had just bought the painting and the dealer said, "Oh yes, my conservator looked at it and said he couldn't clean it either". Will the owner be happy with his dirty painting?

In another case, we found that a painting by John Ferguson Weir had been brought to conservators for cleaning three times during the past fifteen years, because the waters of Niagara Falls looked strangely dingy. It turned out that an oil-resin medium in what was once translucent white paint has turned brown. The painting can never be made to look good, and the present curator considers it unexhibitable.

Part of the problem here may be one that we conservators have brought upon ourselves. We have been so positive about the dramatic improvements that cleaning can make that we find it hard to talk about how we are sometimes limited in what we can do. But it seems important to discuss these problems, so that owners will not think less of us for not being able to clean some paintings, or so that, in the worst case, a less sophisticated owner won't take a hard-to-clean painting from conservator to conservator until he finds one reckless enough to try.

Although a lot of the ideas in this talk are not new, and we have raised many questions which we have not answered, it seemed important to take a fresh look at nineteenth-century American paintings, and to try to broaden technical talks to include such subjective things as the ways that artists' techniques affect the appearance of paintings,and what conservators may choose to do about it. We try hard to keep a balance between the objective and the subjective, and have attached the following poem by Emily Dickinson to our stereomicroscope: "'Faith' is a fine Invention/For Gentlemen who <u>see</u> - /But Microscopes are prudent/In an Emergency."

As a footnote to this talk, we would like to mention some special problems connected with the appearance of American "folk" paintings. As we discussed in our talk in the AIC General Sessions, an aesthetic has developed among collectors of American furniture, where a grungy, old, crackled surface is more highly prized than a new-looking surface. This taste has begun to spread to American

"folk" paintings as well.

For example, in the recent sale of a late eighteenth-century portrait by Connecticut artist John Brewster, the condition was cited as one of the reasons that the picture brought the record price at auction of over $850,000. The condition was what in the trade would be called "untouched" but which a conservator would understand to mean that no conservator had worked on it for a long time.

A dealer told us a story about a painting by Joseph Whiting Stock: The present owner, who had bought the painting from the dealer several years earlier, decided to sell the painting and asked the dealer if he was interested in buying it back. The dealer said that by this time the painting would be worth about $20,000 retail, and that the dealer would have been happy to pay $15,000. But while he owned it, the owner had had the painting cleaned and lined, even though the dealer said the painting didn't really need it. When the dealer saw the treated painting, he decided against buying it, because he felt it looked "too new". The owner sold the painting at auction and it brought $8,500. We didn't see the painting, so we don't know if it was treated badly or well, but it is a frightening prospect that conservation treatment could decrease a painting's value.

It is not hard to forsee an interesting conflict for those of us who treat American "folk" paintings, between the intent of the artist, as a conservator sees it, and the desire of an owner to have a painting "look old".

PICTURE VARNISHES: OPTICAL ASPECTS, DEGRADATION PHENOMENA, POTENTIAL OF STABILIZING ADDITIVES, AND NEW EXPERIMENTAL RESINS

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Abstract

An overview of the research project on picture varnishes at The Metropolitan Museum of Art, with emphasis on recent achievements, was presented. The influence of molecular weight and refractive index on the optical properties of varnishes was briefly reviewed. Factors influencing the stability of varnishes and experiments with stabilizing additives were described, with reference to practical aspects such as change in solubility and yellowing. By using additives and eliminating ultraviolet light it is possible to stabilize dammar picture varnish to a remarkable extent. Varnishes based on new experimental resins, hitherto not used in the conservation field, have been proven to possess excellent stability as well as optical properties equivalent to those based on natural resins.

The information presented at the lecture has been published or will be published in the near future. Below follows a list of references to relevant literature.

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