

Reconstruction of Three Kress Paintings from the National Gallery of Art, DC.

The University of Delaware was awarded a Kress grant to reconstruct three paintings from the Kress collection housed at the National Gallery of Art in Washington, DC. These precise reconstructions are intended to engage real and virtual public audiences and enhance the understanding of art historians and other scholars regarding the working processes and techniques of the Old Masters. In doing so, these didactic materials may be used by museum educators in Kress collections nationally to promote the appreciation, interpretation, and preservation of European art from the 14th to the 16th centuries. Brian Baade, a 2006 graduate of the Winterthur/University of Delaware Program in Art Conservation, prepared each reconstruction. Graduate and undergraduate University of Delaware students assisted with art historical research, assembly of relevant bibliographic and technical data, and stages of the preparation.

Each reconstruction was created with nine to sixteen exposed cutaway sections revealing the preparatory layers and painting stratigraphy, textures, transparencies, and brush strokes. All materials used in the reconstructions, bibliographic and technical references, and textual and photographic documentation of the working processes will be assembled and delivered with the reconstructions. These reconstructions and ancillary support materials may be easily distributed to education departments to be used in gallery talks, workshops, and lectures in museums containing Kress collections. The provided documentation will be used in an interactive digital form on the Kress website. Visitors to the site will be able to scroll through the processes used to create the reconstruction and click on specific details that are of particular interest.

The paintings chosen for this project represent three technically distinct working methods originating in different eras, including the Early Italian Master, Giotto di Bondone, the Netherlandish painter, Hans Memling, and the Greek artist working in Spain and using Venetian Renaissance methods, El Greco.

The three reconstructed paintings were the following:

Giotto di Bondone. Italian, probably 1266 – 1337
Madonna and Child, probably 1320/1330. Tempera on panel.
Overall: 85.5 x 62 cm (33 11/16 x 24 7/16 in.)
Samuel H. Kress Collection. 1939.1.256



Hans Memling. Netherlandish, active c. 1465 - 1494
Saint Veronica and Verso, c. 1470/1475. Oil on panel.
Chalice of Saint John the Evangelist [reverse],
c. 1470/1475. Oil on panel.
Painted surface: 30.2 x 23 cm (11 7/8 x 9 1/16 in.)



El Greco (Domenikos Theotokopoulos). Greek, 1541 - 1614
The Holy Family with Saint Anne and the Infant John the Baptist,
c. 1595/1600. Oil on canvas. Overall: 53.2 x 34.4 cm
(20 15/16 x 13 9/16 in.) 1959.9.4



Reconstructions:

Giotto di Bondone. ***Madonna and Child also known as the Goldman Madonna.*** c.1320/1330

1. The painting is executed on a *European poplar* panel Substrate. A tulip poplar panel was used in its stead as European poplar panels of the required size are no longer available. Graduate, undergraduate students, and myself planed the panel to its appropriate thickness using period correct tools.
2. The panel was sized with two coats of collagen glue made from boiled parchment scraps. This was traditionally done to reduce the absorbency of the panel.
3. The panel was covered by a layer of fine linen adhered with parchment glue. This was traditionally done to prevent crack which may occur in the panel from transferring through to the ground and paint layers.
4. The panel received a few applications of an initial ground called *gesso grosso*. *Gesso grosso* is composed of roasted gypsum bound in animal glue. This layer can be applied thickly but it lacks the smoothness required for gilding and tempera painting.
5. The *gesso grosso* was covered with charcoal powder and scraped with a metal scraper until the lack of charcoal indicated that the gesso was smooth.
6. This layer was covered with ten coats of *gesso sottile* bound in parchment glue. *Gesso sottile* is made from roasted gypsum with has been slaked in water for a month. The roasted gypsum is sprinkled into a large amount of water and stirred to prevent setting. Stirring is continued over a month's time. The final re-hydrated calcium sulfate is far finer and whiter than what was available from simply grinding the raw mineral.
7. The *gesso sottile* was scraped like the previous layer.
8. A charcoal drawing was made of the composition. This could be done directly on the smooth panel or done on a piece of paper. The second method was chosen. The outlines of the drawing on paper were perforated using a needle. The drawing was then placed over the panel and charcoal was rubbed over the surface. The pierced holes allowed the charcoal to be transferred to the panel replicating the design.
9. The outer periphery of the figures was then scored into the gesso using a metal stylus so that the outline could be perceived after the panel was gilded.
10. Black ink (carbon black bound in gum Arabic) was then applied by brush to lock in the outlines.
11. Forms were further modeled using *pennello mozzetto* ink washes applied with a round brush spread to make a fan shape using one's finger.
12. Areas to be gilded were covered with many layers of traditional Armenian red bole bound in parchment glue. This red clay allows the gold to be burnished to a high gloss.
13. The bole was then rubbed to a high sheen with a horse hair cloth. This is a traditional method of smoothing bole.

14. The gold leaf was adhered to the panel using traditional water gilding methods. A dilute parchment glue, water, ethanol, mixture was applied to an area slightly larger than the piece of gold leaf to be applied. The glue already in the bole was reactivated by the water in the applied solution. This served as the primary gilding adhesive. The gold leaf was cut and maneuvered over the dampened region using gilder's tips. This fine brush would have been unnecessary in Giotto's era as the gold leaf at that time was far thicker than that available today. The leaf was drawn to the applied solution through capillary action which draws the leaf smoothly to the panel.
15. The gold/bole was then burnished to a high gloss using an agate burnisher. This must be done after the bole has hardened enough to hold the leaf without fracturing but before the bole has hardened enough to resist burnishing. The time required was between four to ten hours after applying the gold depending upon the weather.
16. The complex incising was done before the bole and ground had completely dried. A dull, pointed mental stylus was drawn over the design and thereby incising the design into the gesso, bole, and leaf.
17. Punching was done immediately after the incising. A dull pointed tool was placed over the spot to receive the mark and softly hit. This left an impression in the gold.
18. The painting was underpainted in egg tempera. This is a mixture of egg yoke, water and pigment. The pigment was pre-ground in water to facilitate even dispersion of the pigment in the binder. Mary's robe was underpainted with a mixture of indigo and lead white. Indigo was much cheaper than ultramarine and has been found in Giotto's underpainting.
19. The bulk of Mary's robe was painted with lapis lazuli ultramarine and lead white. This was shaded with admixtures of bone black.
20. The skin was underpainted with a traditional mixture of green earth and lead white. This layer served as the counterpoint to the warm superimposed flesh layers.
21. The skin was shaded with verdaccio (dull gray or greenish mixtures of red and yellow earth with carbon black) in the shadowed areas.
22. The lighter regions of the skin were modeled with mixtures of vermilion, earth colors, and carbon black.
23. The outlines and the proper left of the virgin's face as well as the proper right of the face of the Christ child's face were then heightened with hot red earth colors.
24. Gilded decorations on the Madonna's mantle were first laid out using white chalk. They were then mordant gilded using leaded, boiled oil. This was applied and allowed to set to tackiness. Gold leaf was placed over the tacky mordant and pressed into place using cotton wool.
25. Vermilion and carbon black egg tempera was used give the impression of jewels to portions of the Christ child's halo Madonna's mantle.

Selected Images of the Reconstruction in Progress





Finished Reconstruction



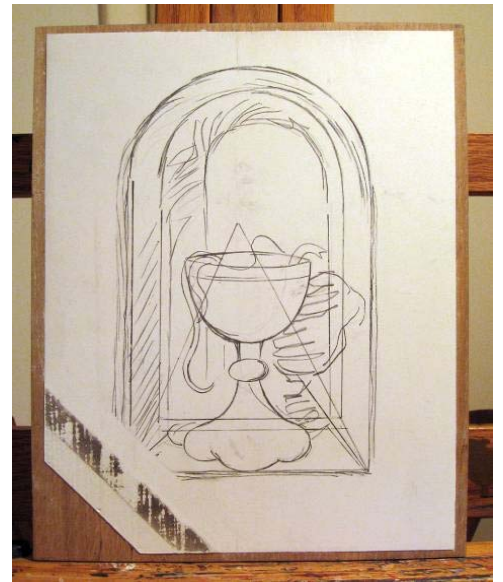
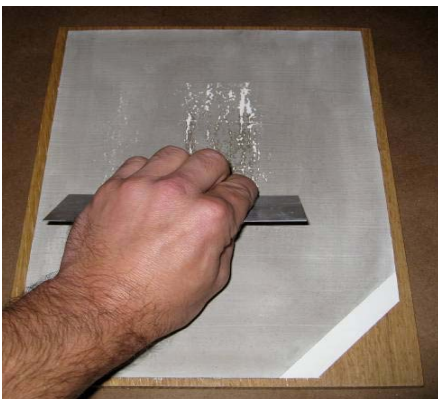
Hans Memling. *Saint Veronica* 1470/1475.

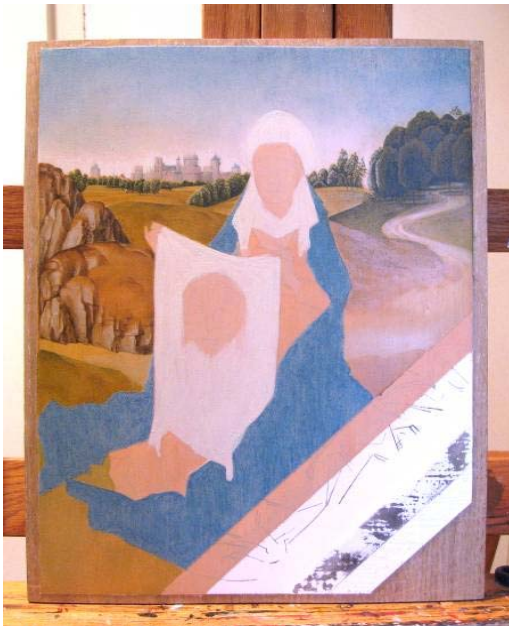
1. The two sided painting is executed on an oak panel. This was planed using traditional techniques.
2. The panel was sized using parchment glue.
3. The panel was given a ground of natural chalk (traditional white filler for painters of the north) bound in parchment glue.
4. The underdrawing was executed freehand in natural black chalk.
5. The underdrawing was locked in, the absorbency of the ground was reduced, and a base tone was imparted by the application of a peach colored ground bound in linseed oil.
6. The sky was painted using mixtures of azurite and lead white in linseed oil.
7. The castle was painted using black, azurite, and lead white in linseed oil.
8. Areas below the castle including the greenery were toned with a mixture of verdigris and earth colors.
9. The foliage was underpainted with verdigris and earth colors, primarily raw sienna.
10. The highlights on the tress were created using a mixture of lead white, lead tin yellow, and yellow earth.
11. The foreground was further refined using the appropriate colors.
12. Mary's veil was established using lead white.
13. Mary's blue robes were underpainted with a mixture of azurite and lead white.
14. Mary's red robes were underpainted in a mixture of red lake and lead white.
15. Details on the red robes were applied using straight red lake.
16. Details on the blue robes were added using pure azurite.
17. Details on the face and hands were added in neutral earth colors.
18. Details on the veil were applied last using neutral brown earth colors.

Chalice of Saint John the Evangelist

1. The painting is executed on an oak panel. This was planed using traditional techniques.
2. The panel was sized using parchment glue.
3. The panel was given a ground of natural chalk, traditional white filler for painters of the north, bound in parchment glue.
4. The underdrawing was executed freehand in natural black chalk.
5. The underdrawing was locked in, the absorbency of the ground was reduced, and a base tone was imparted by the application of a peach colored ground bound in linseed oil.
6. The composition was modeled in earth colors, carbon black and lead white.
7. The shadows were reinforced using darker, more transparent versions of the same color mixtures with less white added.
8. The snake was painted in dark earth colors and black.
9. Highlights and on the chalice were painted using lead tin yellow.
10. Details on the chalice were applied in dark earth colors and black.

Selection Images of the Reconstruction in Progress







Finished Reconstructions



El Greco, *The Holy Family with Saint Anne and the Infant John the Baptist*, c. 1595/1600.

1. The painting is executed on a linen canvas stretched over a panel back strainer variant.
2. The panel back strainer was constructed from pine wood which was planed to shape. The back panel was constructed with a tongue at the top and bottom which would fit into a groove in the outer members. This allows the panel to move with changes in relative humidity without causing damage to the unit as a whole. The strainer unit was intended to allow for the insertion of the painting into a larger polyptych system. It is not known whether this particular painting was originally stretched on such a unit. Similar systems have been found on other El Greco works which retain their auxiliary supports.
3. The strainer members were assembled using parchment glue and secured using wrought nails.
4. The linen was glued to the outer members of the strainer using a parchment glue/wheat starch paste in the manner found on other original El Greco paintings. The paste was not applied to the panel back.
5. The linen was sized with parchment glue to reduce absorbency.
6. A thin ground of gypsum bound in parchment glue was scraped into the interstices of the canvas weave.
7. The white ground was covered with a second oil ground containing red lead, lead white, bone black, and orange earth bound in linseed oil.
8. El Greco may or may not have used an underdrawing. No underdrawing was seen when the painting was examined using IR reflectography. As the painting is one of a few renditions of the composition, El Greco may have proceeded with out an under drawing. Conversely, the underdrawing may not be revealed in IR because of the low contrast caused by the red ground. No black underdrawing was applied to the canvas on the reconstruction.
9. The painting was executed in linseed oil bound colors. The figures were underpainted in grisaille using lead white alone or mixtures of lead white and carbon black. Mary's red robe was underpainted in a mixture of azurite and lead white, and Ann's robe was laid in red lead. Joseph's garment was underpainted in lead tin yellow. Shadows and the outlines of much of the composition were left in reserve revealing the brown oil ground.
10. Mary's robe was then glazed in red lake as were the shadows of Ann's clothing. Verdigris was applied to Joseph's robes and azurite was modeled on Mary's clothing. Azurite was used to modify the sky.
11. The skin of the figures was further enhanced using warm glazes and more opaque additions
12. Dark details were added last wet on dry.
13. The painting was varnished using mastic resin dissolved in gum turpentine.

Selected images of the Reconstruction in Progress





Finished Reconstruction