Structural Conservation of a late 16th-early 17th Century Panel Attributed to Paul Brill

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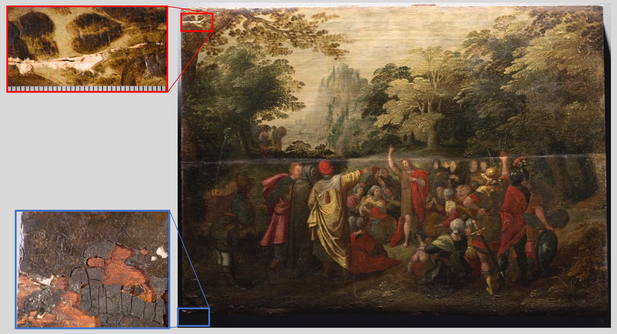
Introduction

Saint John Preaching in the Wilderness is part of a recently discovered art collection at Gannon University, in Erie, PA. In 2017-2018 after being stored for many years, the painting underwent conservation treatment. The painting is executed on oak panel and is attributed to Paul Brill.



Attr. to Paul Brill, *Saint John Preaching in the Wilderness,* Oil on Red Oak Panel, 16th-17th C.

Condition

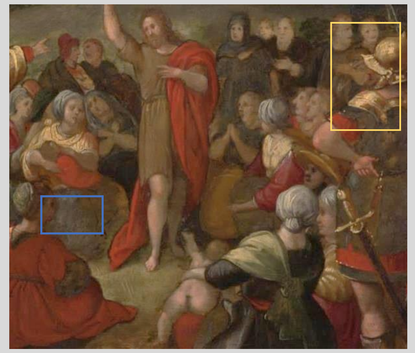
The painting exhibited differential convexities in each of the two planks that formed the panel, and significant areas of wood-worm tunneling. Additionally, the panel was thinned, and the attached cradle system was seized, contributing to the poor condition both structurally and aesthetically.

Red box: A crack in the panel with associated losses to the paint and ground layer. **Blue box:** A failing old repair at an area of prior losses to the paint and ground. **Yellow box:** Wood-worm tunneling exposed after removal of the cradle.

Analysis

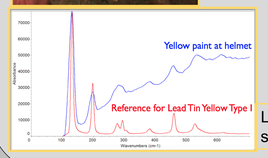
Raman Spectroscopy, cross-sectional analysis and X-ray fluorescence spectroscopy (XRF), both Spot XRF and Scanning XRF were employed for the analysis.

The use of period appropriate pigments such as lead-tin yellow type 1 and smalt blue was confirmed. Analysis was also performed on the wooden support, and determined the wood as red oak. The wood identification was important as red oak is hygroscopic and therefore reactive to moisture far more than a white oak. With the wood type confirmed, the structural concerns of the panel painting could be better addressed.



Detail of XRF scan area. Blue box: Smalt pigment
Yellow box: Lead-tin yellow type I

Smalt was identified using XRF by the presence of Co, Al, Si. The area appears grey due to degradation of the once blue pigment.



Lead-Tin Yellow Type 1 was confirmed at the soldier's helmet using Raman Spectroscopy

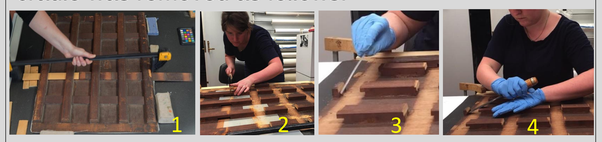
XRF false color map of five elements detected: **Cu**, **Sn**, **Hg**, **Co**, **Pb** (White)

Structural Treatment

A combination of both modern and traditional methods were used to treat the panel, including full removal of the cradle and the addition of a new custom-built flexible auxiliary support secured to the reverse.

Cradle Removal

After applying a protective facing to the front the cradle was removed as follows:



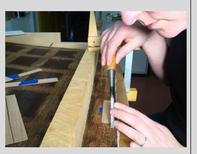
1. Movable battens were removed with clamps
2. Slots were sawn out from the fixed battens
3. At remaining adhered blocks of wood, methanol was injected to dehydrate the proteinaceous adhesive
4. The blocks were then levered off using a chisel

Removing Non-salvageable Wood

Cradle removal revealed extensive insect tunneling along the top edge, impacting the stability of the support in this area. The most damaged areas of tunneling were carefully reduced using chisels, amounting to half the depth of the panel in most affected locations.

Detail of insect damaged wood

The painting was secured face-down in a custom jig.



Removing non-salvageable wood.

Consolidation and Filling

Damaged areas in better condition were consolidated using Paraloid B-72 in xylenes and ethanol, then filled using a putty of phenolic micro-balloons and B-72.

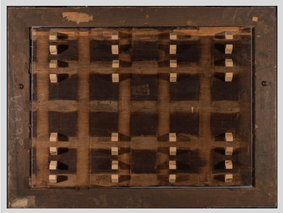
Applying the B-72 and microballoon putty

Removed sections of wood were filled with a similar Red Oak species to allow consistency in movement. The wood fills were cut in the same orientation as the original wood of the painting and attached using B-72.

Above and right, red oak wood fills

Construction of a Flexible Auxiliary Support

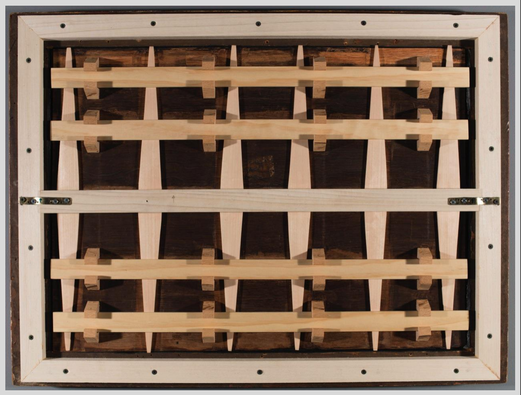
This new support suspends the painting within its existing frame. The design is based on a prior support created by Prof. James Hamm and Sandra Kelberlau, who in turn were influenced by the designs of Simon Bobak and Raymond Marchant. The new support allows the wood to move while at the same time gently encouraging it into plane. The flexible auxiliary support was constructed as follows:



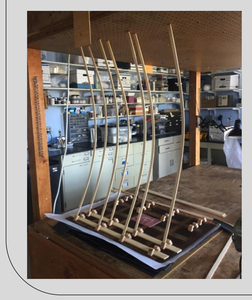
1. **Red Oak blocks** were adhered to the back of the panel using fish glue and clamped using a modified shimbari technique (below).

2. A **poplar framework** was attached to the back of the painting's frame. (A similar support designed by Sandra Kelberlau and Prof. Hamm is visible in the background below.)

3. **Flexible Basswood battens** were attached vertically to a central 'spine'.



4. **Horizontal linden battens** slid into position. The spine was attached to the poplar framework. The support is complete.



Trial & Error

An initial experimental design for this auxiliary support used vertical ribs composed of laminated layers of BEVA film adhesive and G-10, a composite material of epoxy resin and fiberglass. The layers were adhered together using heat, and cooled under pressure. Delamination of the BEVA film and G-10 layers occurred when the ribs were screwed into the wooden spine, resulting in failure of the rib mechanisms to apply gentle, even pressure. To solve this issue, the G-10 and epoxy ribs were removed and substituted with custom-fabricated basswood ribs.

Conclusions

The treatment allows the wooden panel to once again serve its purpose in supporting the painting while at the same time permitting the panel controlled flexibility to adjust to environmental conditions.

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