

# In-Depth Technical Analysis and Treatment of a Floral Still Life Painting



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**Abstract:** *Flowers in a Glass Vase* (Unknown artist, Memorial Art Gallery, Rochester, NY; No.: 54.69, 18 $\frac{1}{8}$  x 13 $\frac{3}{8}$  x  $\frac{3}{4}$  inches) had never been on display due to its condition. Aged and darkened varnish obscured the colors and details of the oil painting on an open-weave canvas. No provenance existed prior to its acquisition in 1954. The painting had undergone numerous undocumented treatments, including a glue-paste lining. Cleaning tests were done in the 1980s, but no further treatment was carried out. For this project, analysis was undertaken to identify the artist's palette, narrow down the creation date and origin of the painting, and to inform treatment. Treatment structurally stabilized the painting and revealed the vibrant original colors and details of this small floral still life. The most important aspects of this analysis and treatment are highlighted below.



Fig. 2: After treatment, front, normal illumination



Fig. 1: Before treatment, front, normal illumination

## TECHNICAL IMAGING AND ANALYSIS

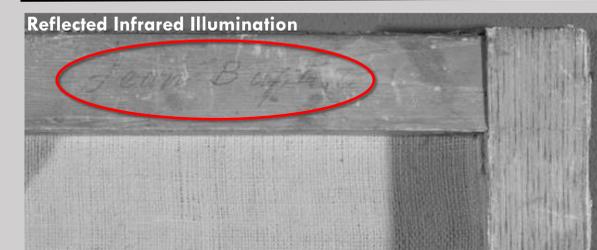


Fig. 3: Infrared imaging (with X-Nite 780 filter) revealed a name, "Jean-Baptiste", written in graphite on the back of the upper stretcher bar.



Fig. 4: UVA-induced visible fluorescence of the red pigment, after varnish removal. It is most apparent against the dark brown background in the upper left.

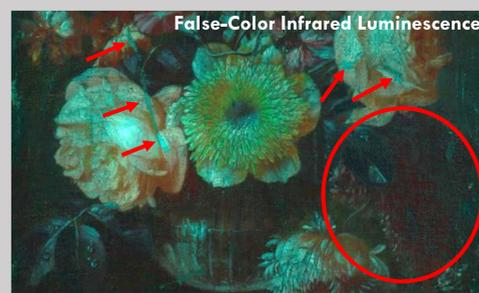


Fig. 5: False-Color IR Luminescence (with Wratten 88A filter) revealed overpaint in some areas, and more details of the flowers in the lower right corner.

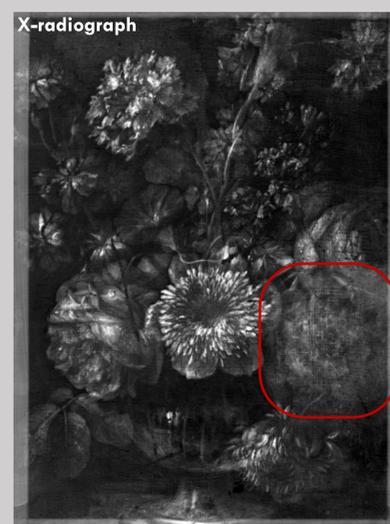


Fig. 6: Direct exposure radiograph; 25 kV, 2240 mAs.



Fig. 7: Transmitted IR illumination (X-Nite 1000B filter).

X-Ray Fluorescence (XRF) mapping was used to analyze elemental distribution and aid in identifying pigments.

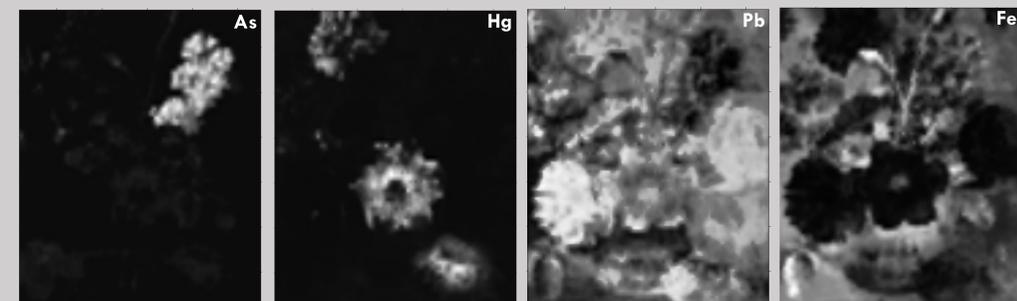
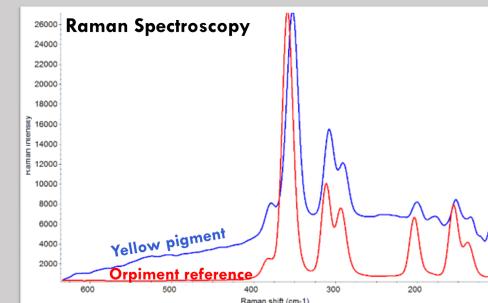


Figure 8: Arsenic XRF map. Figure 9: Mercury XRF map. Figure 10: Lead XRF map. Figure 11: Iron XRF map.



Graph 1: Orpiment was identified as the yellow arsenic-based pigment.

The XRF scans (above) showed the presence of arsenic in the yellow flowers (fig. 8), which indicated the likely presence of either orpiment or realgar. Mercury in the red areas (fig. 9) is indicative of the pigment vermilion. The lead map (fig. 10) indicated that the artist's white pigment was likely lead white. Copper was not found in the green areas, but iron was strongly present (fig. 11), which suggests an earth-based pigment.

Raman analysis (Graph 1, left) with a 785 nm laser was able to distinguish between orpiment and realgar for the arsenical yellow pigment.

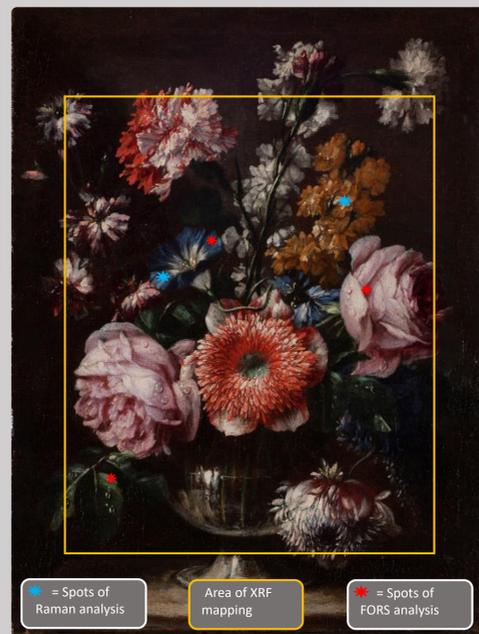
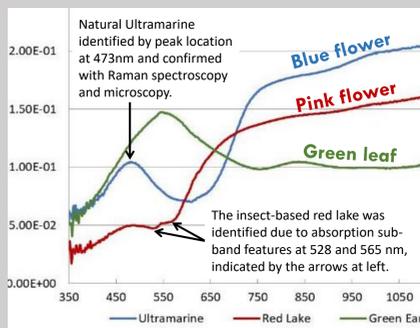


Figure 12: Schematic of various analytical techniques and the locations where they were applied to the surface of the painting.

Fiber Optic Reflectance Spectroscopy (FORS) identified green, pink and blue pigments.



Graph 2: FORS spectra obtained from 3 spots (see diagram).

The green pigment was identified as green earth (terre verte) and the fluorescing pink of the rose, peony, and background flowers (fig. 4) was identified as a carmine lake pigment, made from the kermes insect, which is native to Europe. This red was commonly used by European artists until the early 17<sup>th</sup> century, when cochineal from the Americas became more widely distributed. The presence of ultramarine blue was also confirmed in the convolvulus flower. Sampling spots pictured in fig. 12 (left).

## TREATMENT



Fig. 13: Aqueous cleaning with 2% triammonium citrate in deionized water.



Fig. 14: Varnishing with Paraloid B-72 and Laropal A81 mixture (5:1).



Fig. 15: Inpainting with Gamblin Conservation Colors.

**Summary:** The painting was surface cleaned (fig.13) and the varnish and overpaint were removed (fig. 16-17). The canvas was removed from the auxiliary support and edge lined, then reattached to the stretcher. An isolating varnish was applied by brush (fig. 14) and fills were completed using pigmented wax/resin and Aquazol paintable fills. Inpainting was done with Gamblin Conservation Colors (fig. 15) and a final varnish was sprayed.



Fig. 16: Detail of peony during varnish removal.



Fig. 17: Detail of peony after varnish removal.

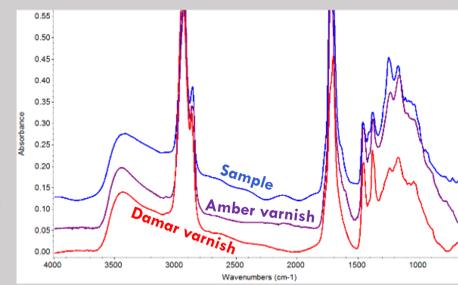
## ACKNOWLEDGEMENTS

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## Fourier Transform Infrared (FTIR) Spectroscopy was used to analyze the varnish.

A small sample was taken from the surface of the painting, next to an area of damage, before any testing for varnish removal had begun. It was analyzed and found to be very similar to reference samples of both aged amber and aged damar varnishes (Graph 3, right).



Graph 3: FTIR spectrum obtained from sample and reference spectra.

## RESULTS and CONCLUSIONS

The painting is now structurally sound and the visibility of the color and detail has greatly improved. This clearer definition, along with the scientific investigation, allows a better attribution to be made. The painting likely dates from the 17<sup>th</sup> century, based on the palette, and shows some similarity to paintings by Jean-Baptiste Monnoyer (1636-1699), a well known French court painter. This could also help explain the inscription on the stretcher. Imaging proved that the artist changed the composition during its creation, which rules out the possibility of this being a direct copy. Further comparisons of the technical data with known floral still life paintings would help confirm this proposed attribution. The painting is once more exhibitable and suitable for display at the Memorial Art Gallery, once a period-appropriate frame is found.

### Flowers in a Vase artist's palette:

- White: Lead White
- Yellow: Orpiment
- Reds: Vermilion and Carmine Lake
- Green: Green Earth
- Blue: Natural Ultramarine
- Brown: Likely Umber
- Black: Unknown

**This project showed the necessity of using a variety of scientific techniques to identify artist palettes, and the value of collaborating with specialists from different institutions.**