

Characterization of Varnishes on 19th-Century Furniture from Montréal

Carl Magarro

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Art Conservation Program, Department of Art History and Art Conservation
Queen's University



INTRODUCTION

This study examined three 19th-century Montréal, Québec furniture pieces from the Canadian Museum of History (CMH), focusing on varnish coatings. Varnish layers are complex and have evolved over the years, based on available resources, preferences of individual furniture makers, and techniques developed over time. To understand the components that make up these varnish layers, scientific analysis can be used as a starting point to provide insight into these long-standing traditions.

EXPERIMENTAL

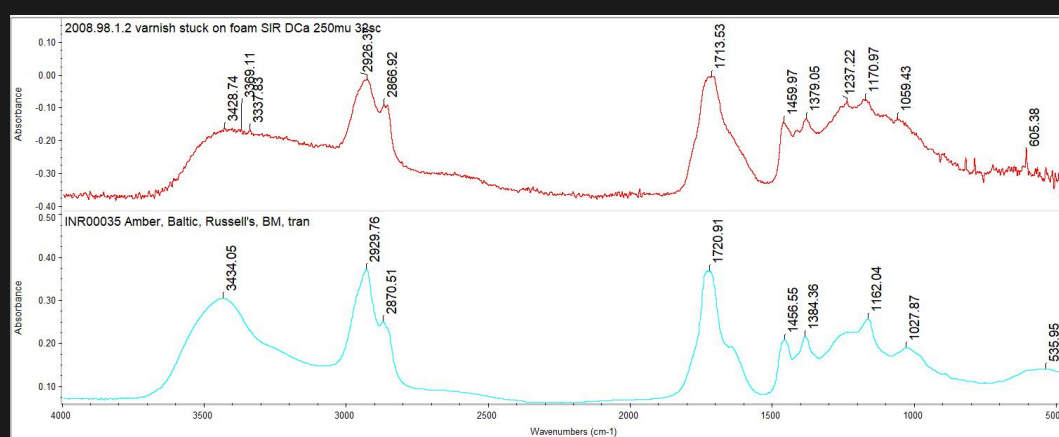
- The furniture pieces chosen for this study are by 19th-century cabinetmakers William Drum, Philippe Vallière, and Charles Barbeau.



a) Drum, William, sofa, 1859, 978.37.2;
b) Vallière, Philippe, gentleman's chair, 1860-1870, 2008.98.1.2;
c) Barbeau, Charles, chest of drawers with mirror, 1890-1910, A-621.

- Samples were extracted from each furniture piece using a steel metal syringe (Carr, 2002).
- Reflectance light microscopy and ultraviolet (UV) fluorescence were utilized to understand layer structure.
- Fourier-transform infrared (FTIR) spectroscopy identified organic components within varnish layers.

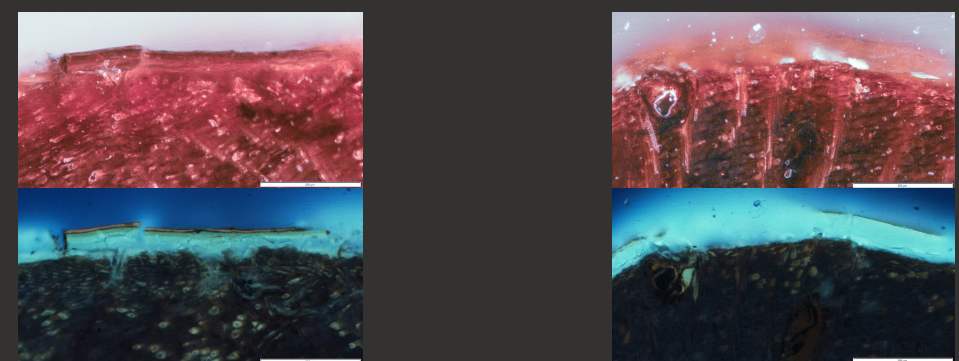
IR spectra of Vallière sample compared with Amber.



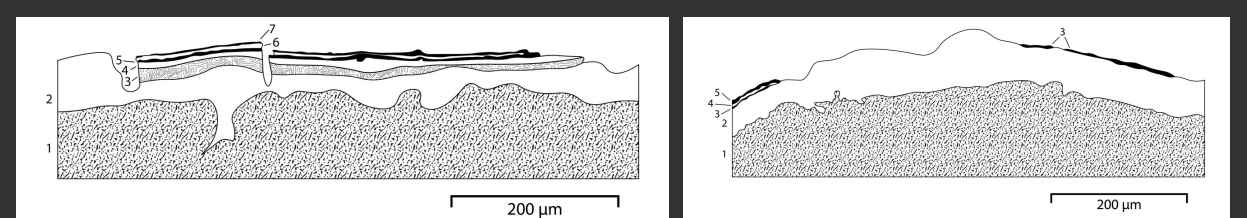
RESULTS & DISCUSSIONS

Cross-section Analysis

- The layer structures between the Drum and Vallière samples were similar in appearance with thick bright white fluorescent layers and an additional thin coating overtop, possibly between two layers of dirt.
- Complications arose when ejecting the Barbeau sample from its syringe; however, FTIR analysis could still be undertaken.



Cross-section of Drum (left) and Vallière (right) samples at 200x magnification. Top: reflected light. Bottom: wideband UV fluorescence.



Cross-section diagram of Drum (left) and Vallière (right) samples.

FTIR Results

- Data showed similarities between all coatings.
- When compared to database results, the spectra were similar to tree resins such as amber, copal, and dammar and shows little or no presence of drying oils. However, Py-GC-MS is required to confirm.

CONCLUSIONS

By employing multiple analytical techniques on the samples, a clearer understanding of the materials, layer structures, and application method can start to develop. Not one analytical technique can identify the compounds used in the formulation of the varnish layers with absolute certainty. The combination of these processes aid in a comprehensive characterization of the samples and can verify and validate findings through the cross-reference of results.

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SELECT REFERENCES

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