

John Habib

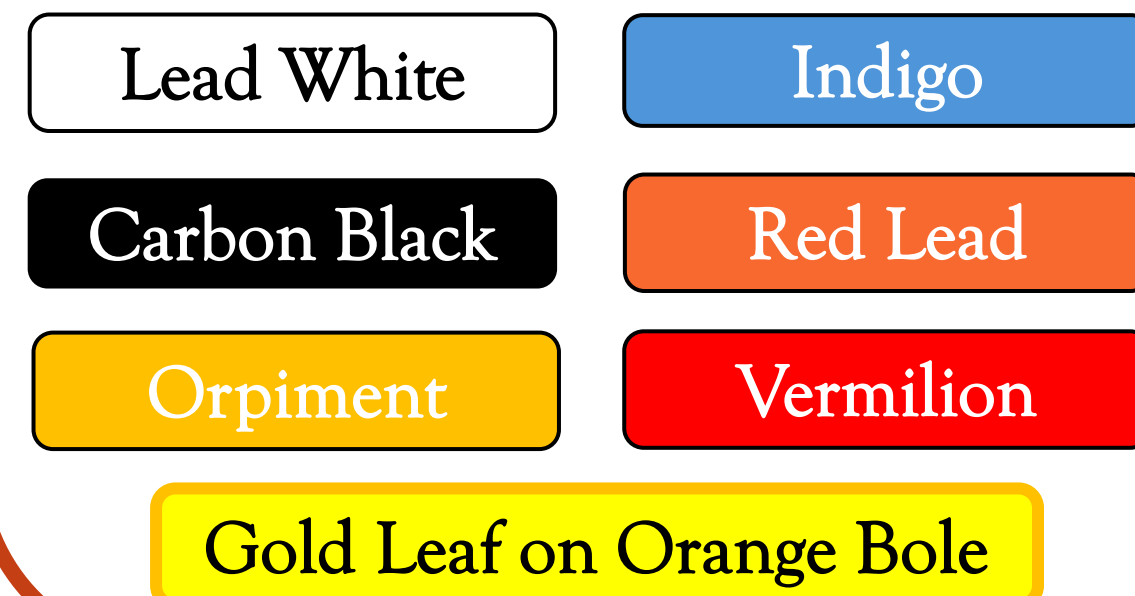
Art Conservation Program, Department of Art History and Art Conservation, Queen's University, April 2024

Introduction

- Written in 1766AD in Cairo, Egypt
- By Ibrahim the Scribe, a crucial 18th century figure that revived Coptic iconography
- Currently at the Coptic Museum of Canada
- The manuscript has several full-page illuminations, the only figurative illumination is the subject of this investigation.

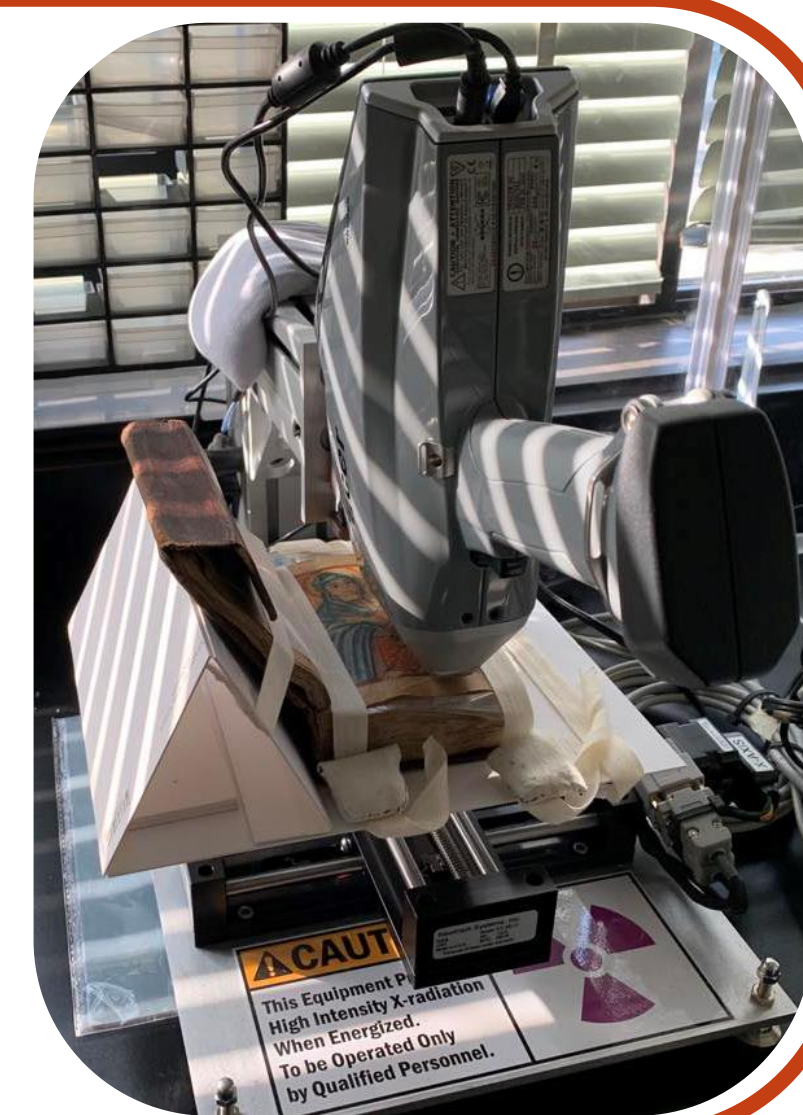
Background

- 3 previous studies have examined paintings by Ibrahim on wood and identified^{1,2,3}:

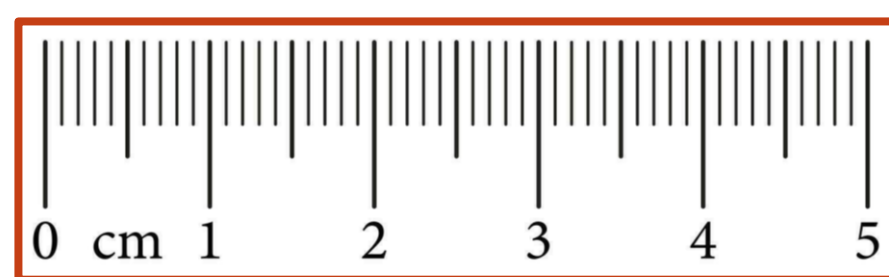
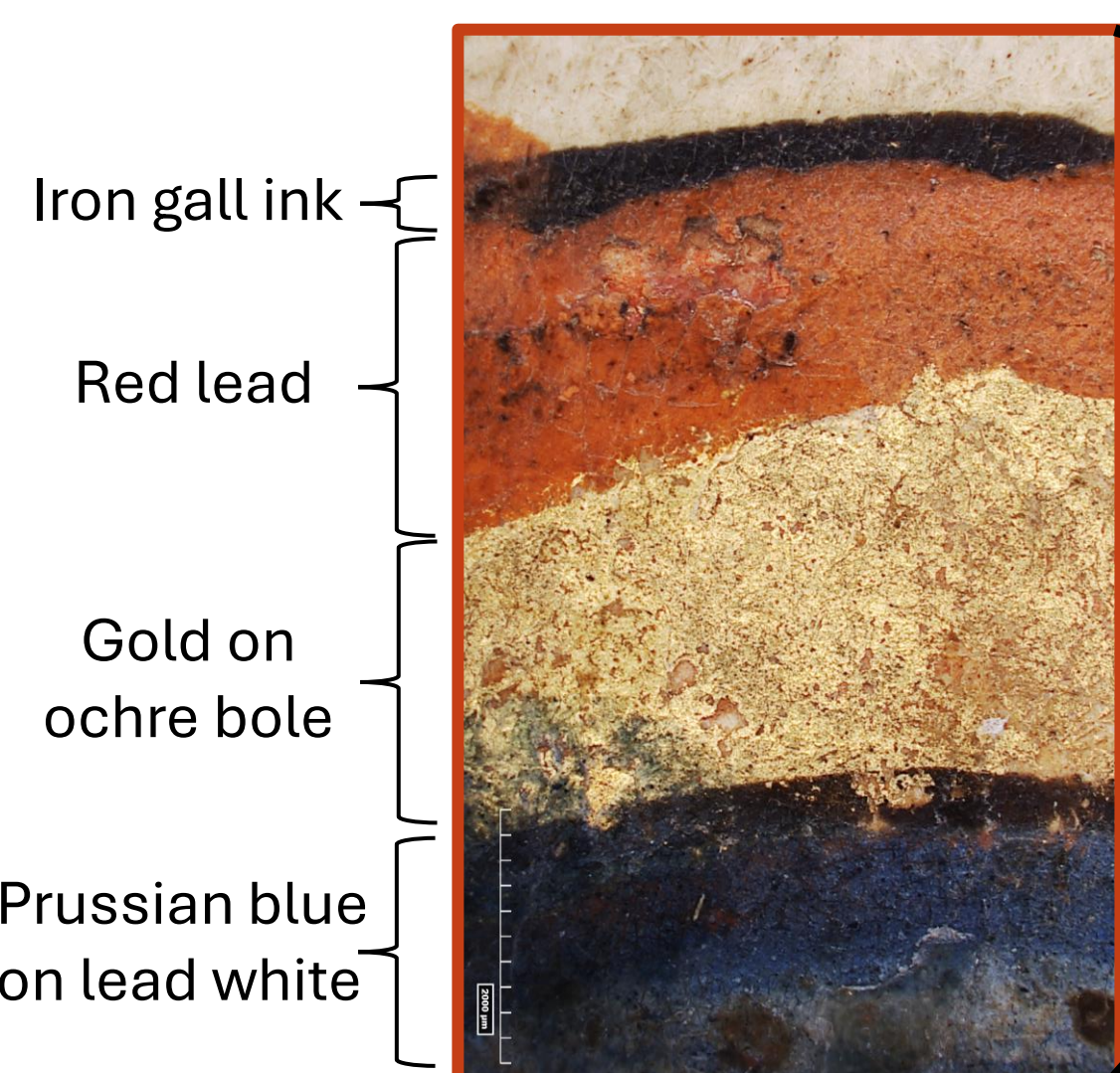


Experimental

- Hirox microscope
- Multispectral imaging
- X-ray fluorescence: Bruker M6 Scanning XRF and Tracer 5g
- External Reflection - Fourier Transform Infrared Spectroscopy
- Fiber Optics Reflectance Spectroscopy

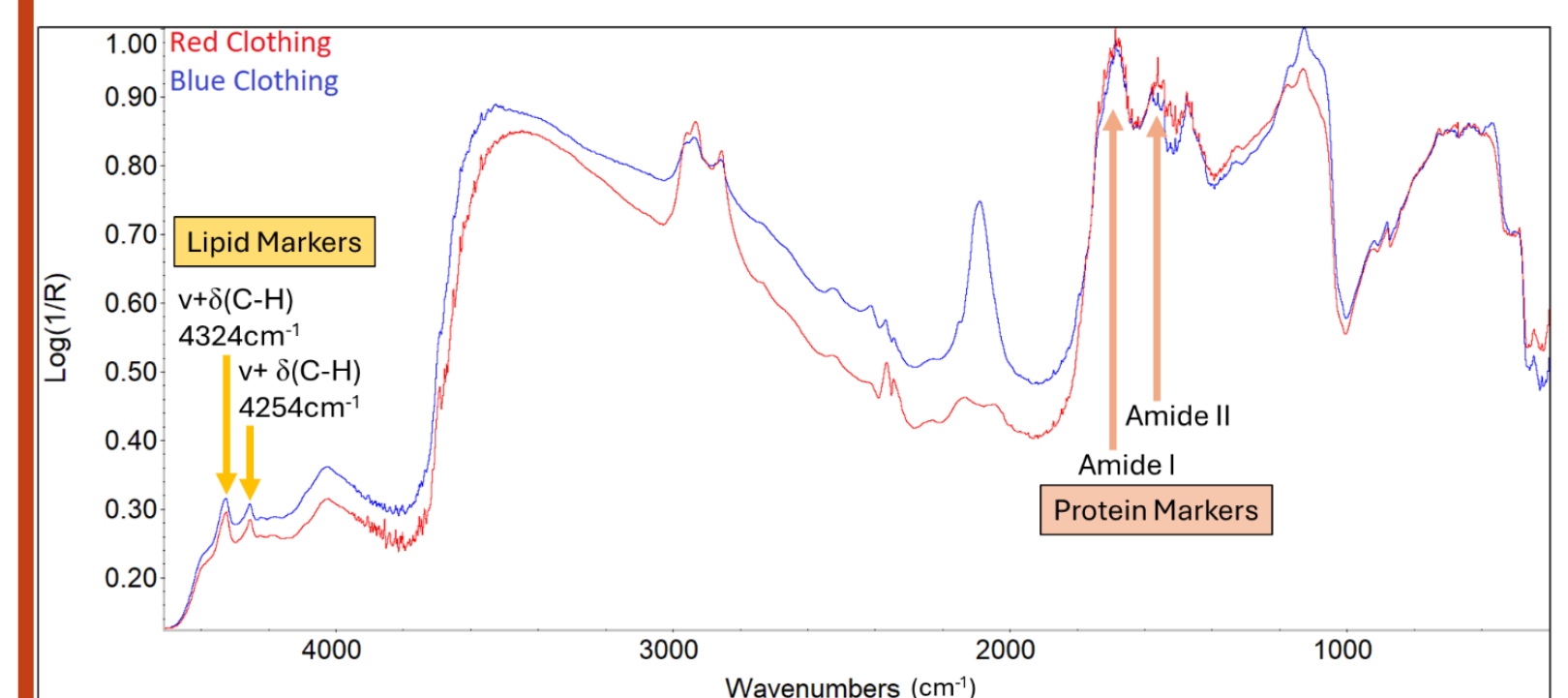


Results

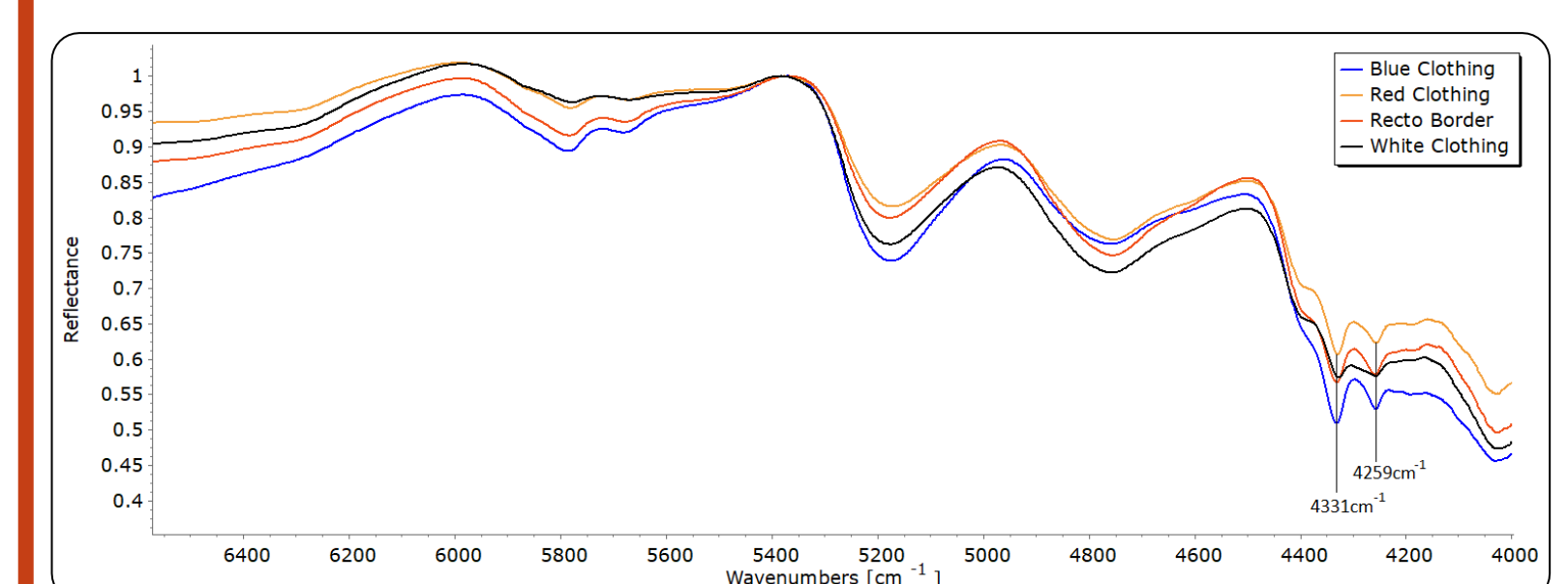


Binder

- Egg yolk was detected using ER-FTIR in St. Mary's and Christ's clothing.
- Proteinaceous amide I and II peaks and $\nu+\delta(\text{C-H})$ peaks

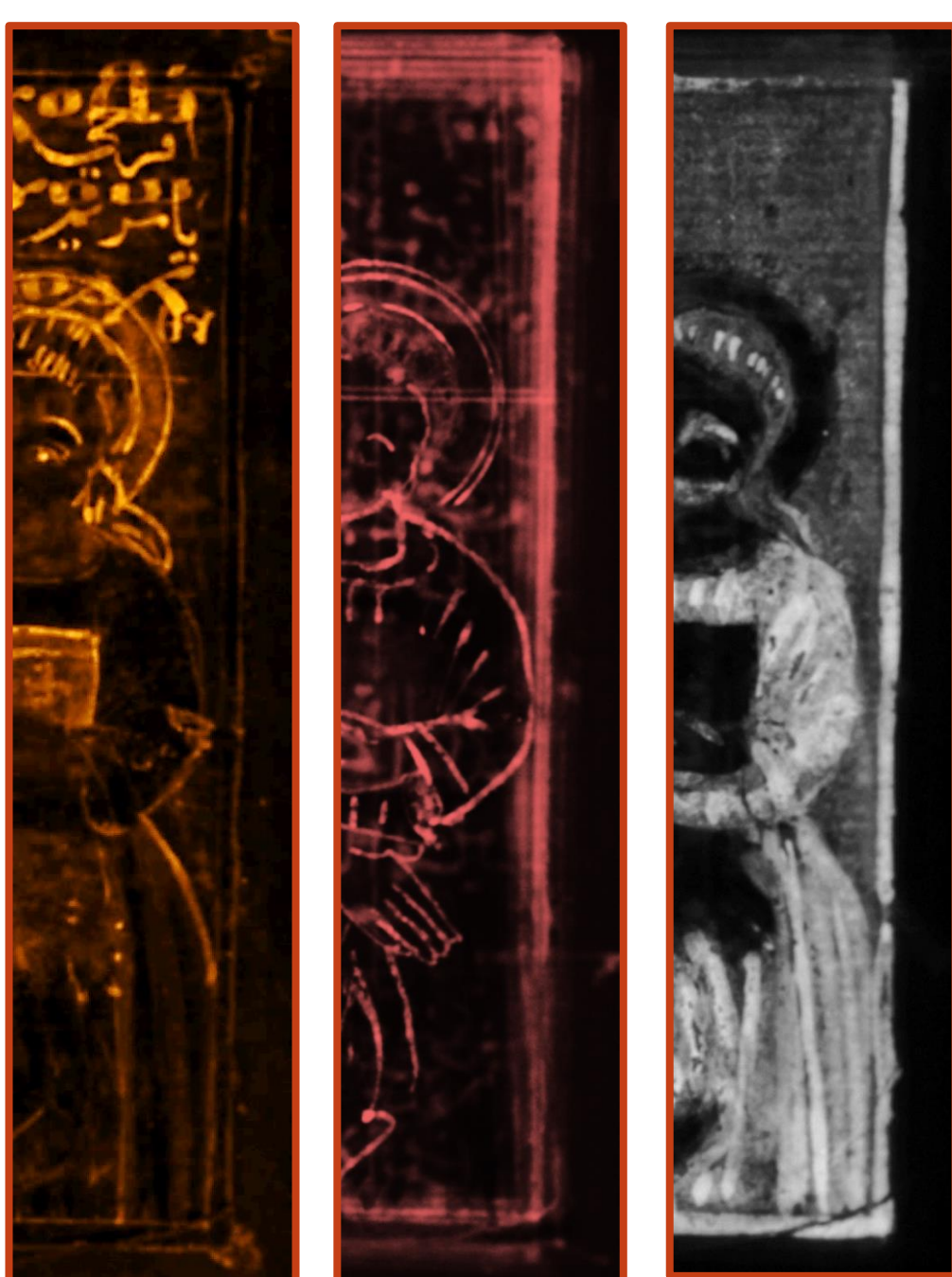


- The egg yolk $\nu+\delta(\text{C-H})$ absorbance bands were also detected using FORS.



Pigments

XRF characterized elemental components of lead white, red lead, vermilion outlines, orpiment background, gold on an ochre bole in the halos and iron gall ink.



Fe Hg Pb(L)

Summary of Results

Observed Colour	Pigment Identification	XRF Elements Detected	Key Analytical Equipment	Binder Identified
Black	Iron gall ink	Fe, K, Cu, Zn	Multimodal imaging	N/I
White	Lead white	Pb, S	XRF, FORS shape	Egg yolk
Blue	Prussian blue	Fe, Pb from under paint	ER-FTIR, Hirox	Egg yolk
Bright red	Red lead	Pb, S	XRF, FORS inflection point	Egg yolk
Dark red	Vermilion	Hg, S	XRF, FORS shape	N/I
Yellow	Orpiment	As, S	XRF	N/I
Gold	Gold leaf on clay bole	Au, Fe, Si	XRF, Hirox	--

Conclusion

- This investigation is the first technical examination of a post-medieval Coptic Manuscript and is the earliest confirmed witness of the use of Prussian blue in a Coptic manuscript.
- The pigments were found to be consistent with Ibrahim Al-Nasikh's palette that he used on his paintings apart from the blue pigment. In his paintings, he exclusively used indigo while Prussian blue is the pigment identified in this manuscript illumination.
- Egg yolk was detected as the binder of some of the paint media, consistent with Ibrahim's training as an iconographer. Further investigation into the binders is being performed by Dr. Margaret Veall at the Canadian Conservation Institute.

Acknowledgements

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