

Detecting Artist's Material Anachronisms in Historic Paintings through Polarized Microscopy

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With my semi-retirement calling, I have been working as a freelance Forensic Art Historian. My principal tool for identifying artist's materials is the Polarized Light Microscope.

One method of art forgery detection involving artist's materials is identifying anachronisms. Anachronisms are artist's materials whose discovery and start dates for commercial availability are inconsistent with the supposed date of creation of the paintings under investigation. An anachronism example involving 19th century paintings would be Titanium White whose date of commercial availability is 1920/23. If Titanium White is found extensively in a supposed Juan Luna (1857-1899) painting, this could be grounds for questioning the true vintage - hence, authenticity - of the painting.

In the course of microsampling and examining paintings, I have accumulated micrographs of pigments and canvas fibres which are indicators of true historic vintage and, conversely, of pigment and canvas fibre anachronisms. The table below provides the start and end dates of pigments and canvas fibres compared against the dates of birth and death of two of the most important Filipino Masters in Philippine history - Juan Luna and Felix Resurreccion Hidalgo.

Biographic Data and Start/End Dates of Commercial Availability of Selected Artist's Materials:		
Artist's Materials	Start Date	End Date
Lead White	Before 1300	No longer commercially available at the beginning of the 20th century
Verdigris	Before 1300	No longer commercially available at the beginning of the 20th century.
Flax (Linen) Canvas Fibre	1400s	Continues to be available today.
Cotton Canvas Fibre	1920	Continues to be available today.
Phthalocyanine Green	1938	Continues to be available today and has been used to replace historic green pigments due to its ability to mimic various hues of green.
Juan Luna	*1857	+1899
Felix Resurreccion Hidalgo	*1855	+1913

McCrone Atlas of Microscopic Particles at www.mccroneatlas.com

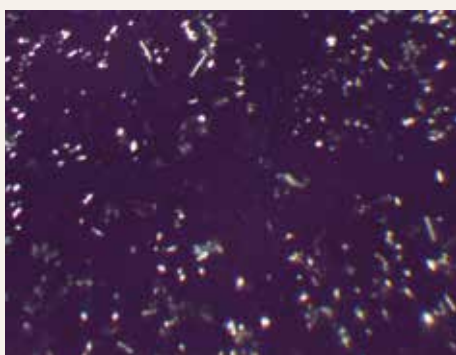


Figure 1: Lead White, 100X using fully crossed polars, FOV=1.8 mm. Due to its toxicity, Lead White was replaced by Zinc White by late 19th century and completely by Titanium White in the 20th century. If found extensively in a painting, Lead White is a strong indicator that a painting is of 19th century or earlier vintage.

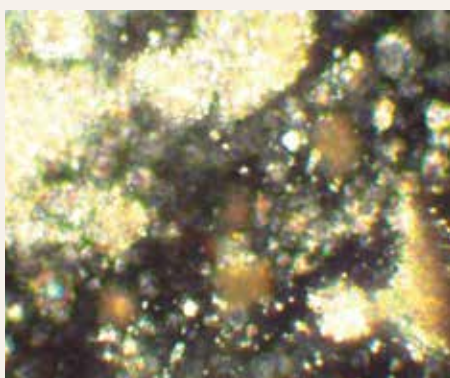


Figure 2: Verdigris, 630X using fully crossed polars, FOV=0.28 mm.

Verdigris was similarly phased out in the 20th century due to its toxicity. If found in a painting, Verdigris could date the painting to be 19th century or earlier.

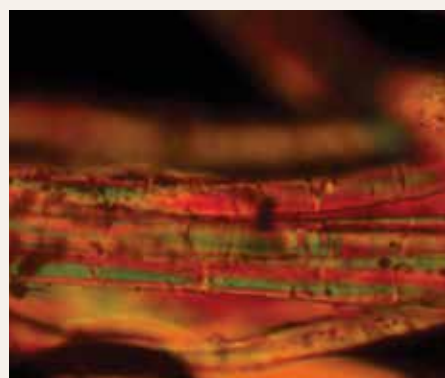


Figure 3: Phthalocyanine Green, 400x using plane polarized light, FOV=0.45 mm. Dark green using plane polarized light and isotropic (black) under fully crossed polars. If found extensively in a painting, the painting must have been created after 1938.

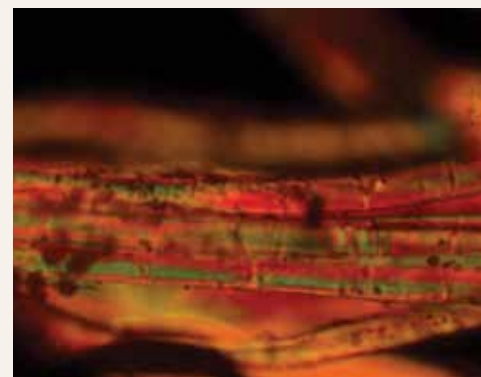
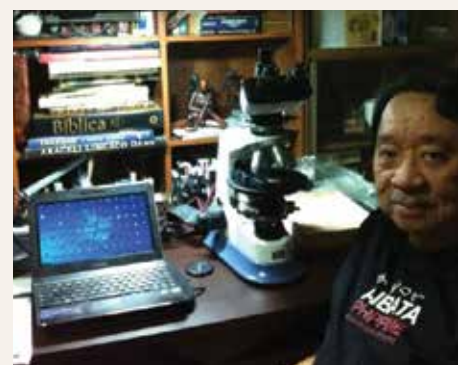
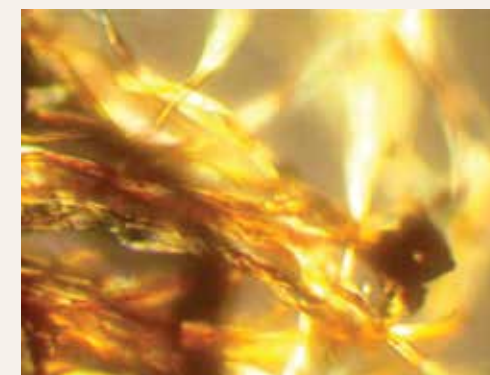


Figure 4: Flax (linen) canvas fibres, 400X using fully crossed polars, FOV=0.45 mm. These colourless (using ordinary or plane polarized light) fibres have slight thickenings at nodes in shapes like I's, X's, V's and Y's which are most readily observed using fully crossed polars. Both Juan Luna and Felix Resurreccion Hidalgo, being expatriates who painted mostly in Europe, would have used linen canvasses since these were the heavily favoured support for oil paintings in 19th century Europe.

Figure 5: Cotton Canvas Fibers, 250X using fully crossed polars, FOV=0.72 mm. This micrograph shows the twisted ribbon morphology characteristic of cotton. If cotton canvas fibres is found in the support of a supposed Luna or Hidalgo painting, these could be grounds for questioning the true vintage - hence authenticity - of the painting.



researching the painting techniques of Filipino Masters. He has been a member of the Royal Microscopical Society since 2012.

Further Reading

Forensics and Microscopy i in Authenticating Works of art. Peter Paul Brio. *infocus*, issue 1, March 2006.

Historical pigment research: the work of the Pigmentum Project. Valentine Walsh & Nicholas Eastaugh. *infocus*, issue 2, June 2006.

Advanced Microscope Techniques for the Characterisation of Pigments. Robin J. H. Clark & Tracey D. Chaplin. *infocus*, issue 3, Sept 2006.

Available at www.rms.org.uk/publications/infocus/Past/2006

Biography

Julian "Joe" Tongson Jr. is a Diplomate in Cultural Heritage Studies and a freelance Forensic Art Historian specializing in identifying artist's materials using the polarized light microscope. He served as seminar instructor in Heritage Forensics at the Royal and Pontifical University of Santo Tomas Graduate School in Manila, Philippines. He is also a figurative oil painter