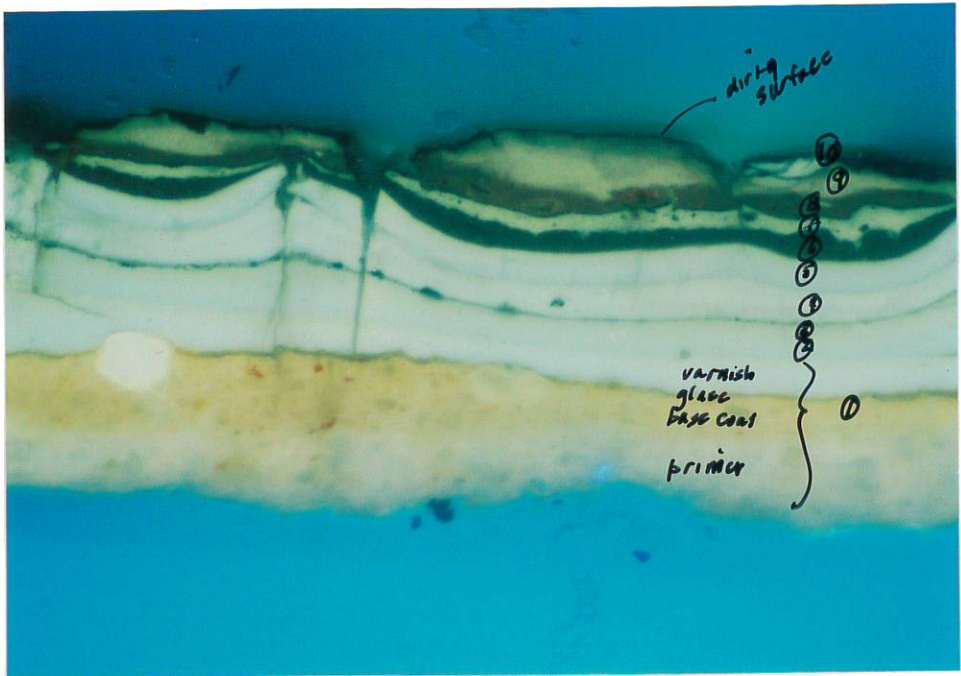


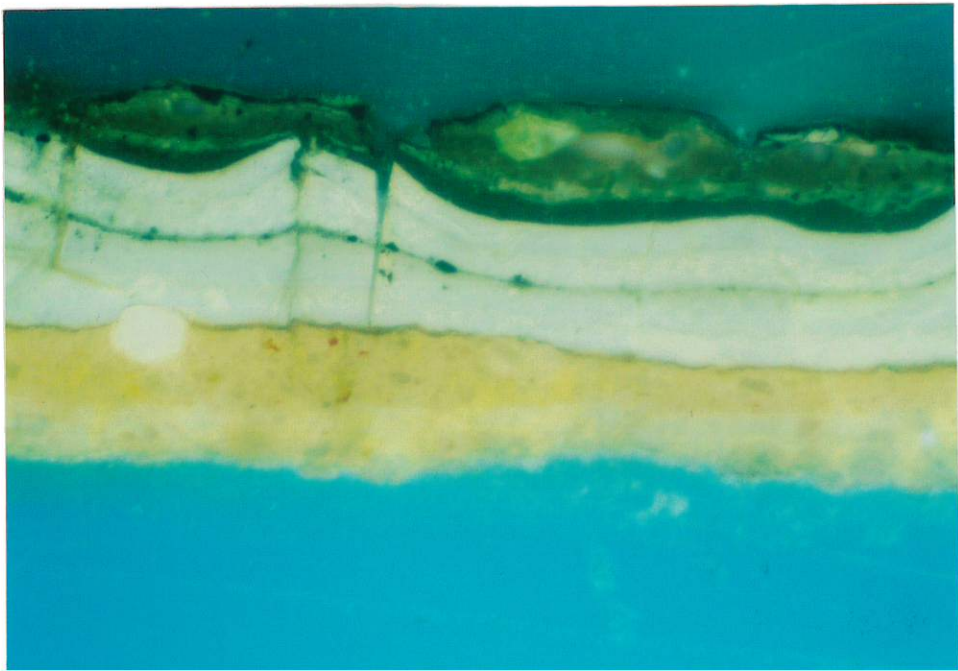
Client: Jonathan Poston, Director of Preservation
Historic Charleston Foundation, 40 East Bay Street
Charleston, SC 29401
Object: Aiken-Rhett House "Tulip Chair"
Sample 1: From center of back at crack

Date: June 20, 2001
Conservator: Susan L. Buck
120-A Delaware Street
New Castle, DE 19720
paintchips@juno.com

Ultraviolet Light 125X



Ultraviolet Light & DCF 125X (fluorochrome stain for the presence of oils)



CROSS-SECTION MICROSCOPY
ANALYSIS RESULTS

Client: Jonathan Poston
Historic Charleston Foundation, 40 East Bay Street
Charleston, SC 29401
Object: Aiken-Rhett House "Tulip Chair"
Sample 1: From center of back at crack

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Equipment: Olympus BH-T Series II Fluorescence microscope with fiberoptic light source for visible light
UV Filter: Ultraviolet Magnifications: 50X, 125X, 250X

Biological Stains:
Fluorescein isothiocyanate (FITC) 0.2% in anhydrous acetone for proteins. Positive reaction color is bright yellow-green
Triphenyl tetrazolium chloride (TTC) 4.0% in ethanol for carbohydrates. Positive reaction color is dark red to dark brown.
2, 7 Dichlorofluorescein (DCF) 0.2% in ethanol for saturated (pink reaction) and unsaturated (yellow reaction) oils.

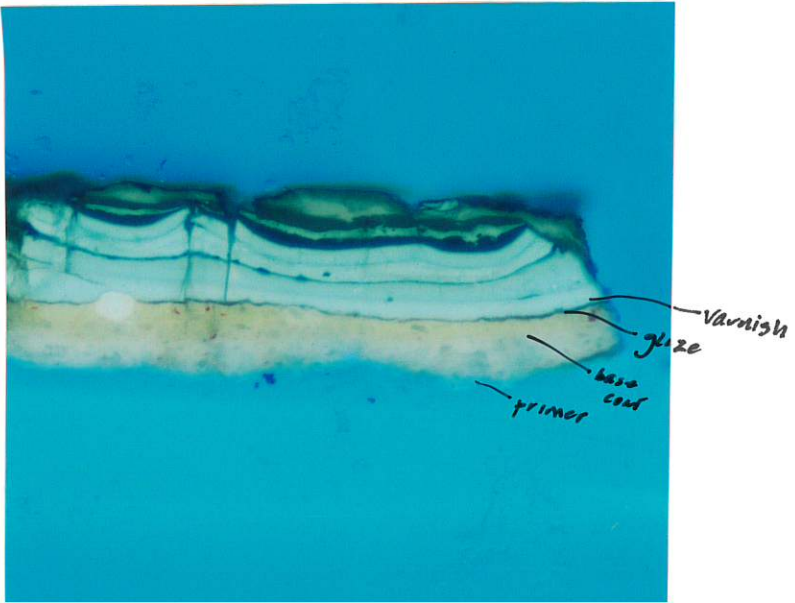
Staining Reactions:
FITC -- No reaction for the presence of proteins.
TTC -- No reaction for the presence of carbohydrates.
DCF -- Faint positive reactions for the presence of unsaturated oils in all of the paint layers.

Comments: The surfaces of the chair now appear blackened and fragile, but cross-section analysis reveals the surviving paint and varnish stratigraphy consists of ten generations of coatings. The earliest coatings on the wood substrate include a leanly oilbound off-white primer, a pale beige-yellow base coat, a thin reddish-tan glaze and a plant resin varnish coating. This sequence of coatings is typical of grain-painting applied to imitate figured wood. The beige-yellow color of the base coat suggests the chair may have been painted to simulate oak, or perhaps cedar. Generations 2 through 5 are plant resin varnish layers with dirt trapped between each layer (plant resin varnishes typically autofluoresce bright white under reflected ultraviolet light). In the sixth generation the chair was repainted black, and then it was varnished over in the seventh generation. In the eighth generation the chair was repainted dark brown, then it was coated with shellac in the ninth generation. Finally it was coated with a plant resin varnish in the tenth generation. There is a thick accumulation of dirt and soot above the uppermost varnish coating, contributing to the current overall dark, indecipherable appearance of the chair.

Visible Light 50X



Ultraviolet Light 50X



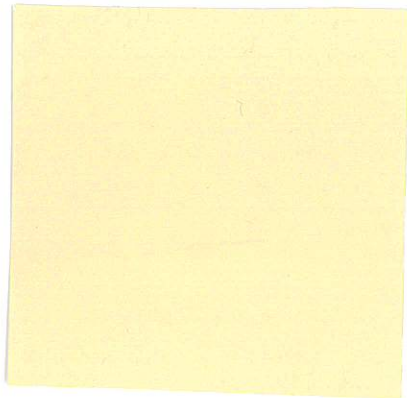
Color Measurement and Matching*

Aiken-Rhett House "Tulip Chair"

Sample 1 -- From back of chair at crack. Color match for graining base coat.

Color System	Coordinates		
Benjamin Moore #2156-60 "soft beige"			
Munsell	1.8Y	9.0V	2.9C
CIE L*a*b*	L*90.9	a*+0.26	b+20.07

The base coat color had to be matched by eye as the earliest paint on the chair is terribly degraded and fragmentary. The very thin reddish-tan glaze could not be color matched because it is so thin and disrupted, however the combination of the soft beige base coat color and the reddish-tan glaze suggests the chair could have originally been grain-painted to simulate oak, or possibly cedar.



Aiken-Rhett House "Tulip Chair"

COLOR MEASUREMENT

After the target layer for color matching were identified through cross-section analysis, an uncast portions of sample 1 (which had been carefully examined under 30X binocular microscope to locate clean, relatively even areas of the base coat layer) was used for matching with the Minolta Chroma Meter CR-241, a tristimulus color analyzer with color measurement area of 0.3mm. It has an internal, 360-degree pulsed xenon arc lamp and provides an accurate color measurement in a choice of five different three-coordinate color systems.

The sample had to matched by eye under a controlled light source as the original base coat for the grain-painting was too fragmentary and dirty to provide an accurate match with the color measurement instrument. The match was first generated in the Munsell color system (a color standard used in the Architectural Preservation field) by comparing the closest Munsell color swatches from a standard Munsell Book of Color (gloss paint standards) was compared under 30X magnification to the actual sample. The measurements were also generated in the CIE L*a*b* color space system, which is currently one of the most widely accepted industry color space measuring systems. Color swatches from the Benjamin Moore Paint Color Preview collection have also been provided for reference. The swatches closely match the measurements and color of each paint layer. Exact Munsell color swatches can also be special ordered.


Susan L. Buck
Conservator and Paint Analyst

June 20, 2001