


**Aiken-Rhett House
Historic Charleston Foundation
Charleston, South Carolina**

Paint Cross-Section Microscopy Report

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Signed: 

Aiken-Rhett Art Gallery Interior Paints

Twenty-two paint samples were taken from the walls, wood trim, skylight area, cast plaster cornice and one remaining door architrave rosette to help identify the original paint history in this room. Reconstruction of the paint history in this space is complicated because the north end of this room underwent major restoration work and it appears the room sustained heavy water damage around and above the windows on the east wall. Fortunately the initial exploration using a 30X monocular microscope suggested there were still intact areas of paint surviving on virtually all representative elements. In addition, fragments of the original plaster cornice and one intact rosette from the corner of a door architrave were preserved in storage and could also be examined and sampled.

The primary questions for reconstruction of the original paint history include:

- What color were the niches and the pilasters for the niches?
- What was the original plaster wall color?
- Is there evidence of the use of wall paper or textile wallcovering in this room?
- Is there evidence of original graining on wood trim elements such as the baseboards and doors?
- How was the cast plaster cornice painted?
- How were the door architraves painted, and were the corner rosettes painted differently than the architrave moldings?
- How was the skylight painted, and how might it have related to the ceiling?

Art Gallery East Wall



Detached Rosette and Cornice Fragments



Plaster Walls and Niches:

The plaster walls are now painted white, while the background walls of the niches are marbled. There are two good samples that represent the paint sequence on the plaster walls. Sample # 7 is from the east wall to the right of the chimney breast. This sample contains five generations of paint beginning with a dark cream-colored oilbound paint, followed by an off-white distemper, then two generations of green paint, and then a tan paint in the fifth paint generation. The most recent matte white paint on the walls is not present in this particular sample. This paint sequence is the same in sample #16 from the west wall between the northwest niche and the window. But in this sample there is a thick black accumulation of mold spores trapped in a crack in the plaster, evidence of long periods of high relative humidity in this room, and the presence of organic additives in the paints that provide food for mold growth. Neither sample #7 nor sample #16 contains evidence of wallpaper (paper fibers, starch paste adhesive residues).

Sample #16 – Northwest corner wall plaster

<u>Layer</u>	<u>Generation</u>
Modern white	6
Light tan	5
Blue-green	4
Deep green	3
Off-white (slightly translucent)	2
Dark cream color	1
Black mold growth in plaster	
Plaster	

Visible Light 125X



Ultraviolet Light 125X

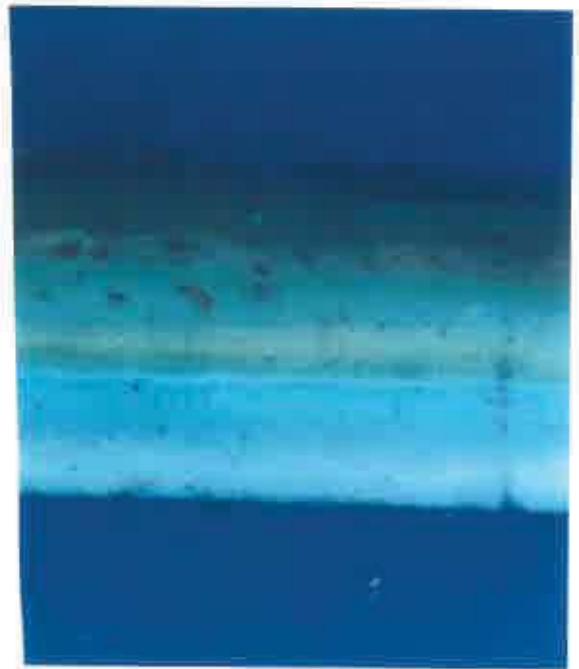


Sample 14 was taken from the rear wall surface of the niche in the northwest corner. Investigations on-site suggested this niche was skimcoated with a modern plaster, perhaps to cover cracks, and then repainted. However, the earlier paint evidence does still survive below the modern skimcoat, and the paint sequence is identical to that found on the plaster walls. This suggests the niches were not painted in a manner to make them visually recede or to set them off from the walls, but rather were the same as the walls.

Sample 14 – Rear surface of niche in northwest corner

Visible Light 125X

Ultraviolet Light 125X



Cast Plaster Cornice and Rosette:

There is only the most fragmentary evidence of the original coatings on the plaster rosette and on the cornice elements. Sample # 17 from the detached rosette contains only the plaster substrate with a film of sooty dirt on the surface. This rosette was perhaps either left unpainted, or perhaps whitewashed, but the evidence is inconclusive. Sample #18 from an original leaf form from the inner border of the cornice contains three paint layers beginning with a coarse gray-blue layer, followed by two off-white paints. It is not possible to determine whether this gray-blue layer is the original paint on the cornice, or whether the cornice was initially whitewashed (a typical treatment for ceilings and cornices) and the ephemeral whitewash simply does not survive.

Sample 17 – From detached rosette, corner of window trim

Visible Light 125X

Ultraviolet Light 125X



Sample 18 – Original leaf from inner border of cornice where it abuts ceiling
Visible Light 125X



Ultraviolet Light 125X

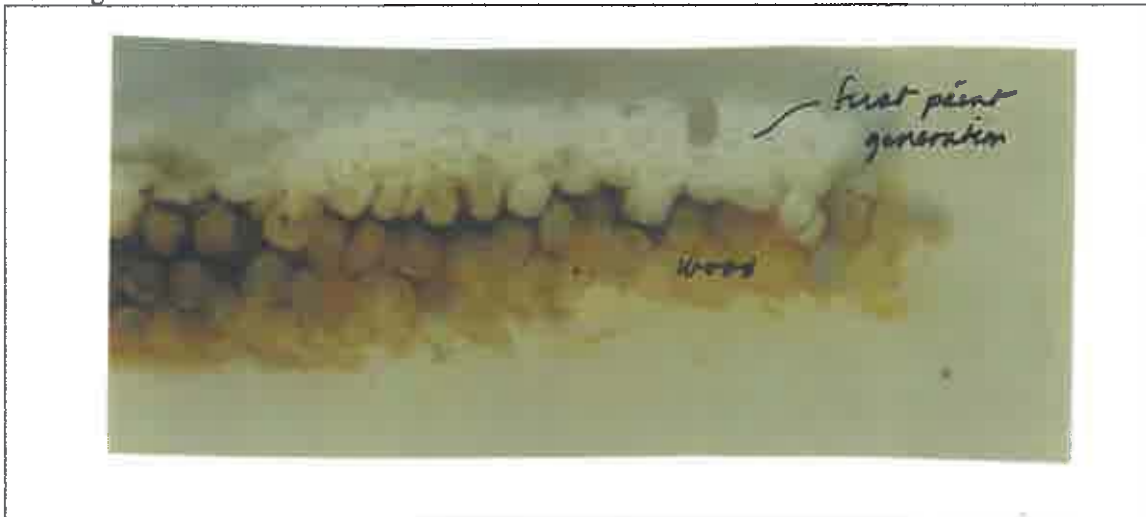


Plinth Blocks, Baseboards:

The baseboards and the plinths for the pilasters in this room are currently marbled with a very dark gray base coat. Two samples (#8 and #11) were taken from baseboards, and two from plinth blocks (#2 and #12). The combined evidence in these four samples indicates there is no history of marbleizing on the plinths and the baseboards, and that in fact these elements appear to have originally been painted with an oilbound cream-colored paint on top of a shellac sealant (that survives trapped in the wood fibers). The first cream-colored paint layer discovered in sample #2 from a plinth block for an east wall window appears identical to the original paint on the bead molding for the same window. This suggests the baseboards and plinth blocks were a continuous cream color around the room, and that the window trim was originally painted the same color as the baseboards.

Sample 2 – Plinth block, east wall, left side of south window

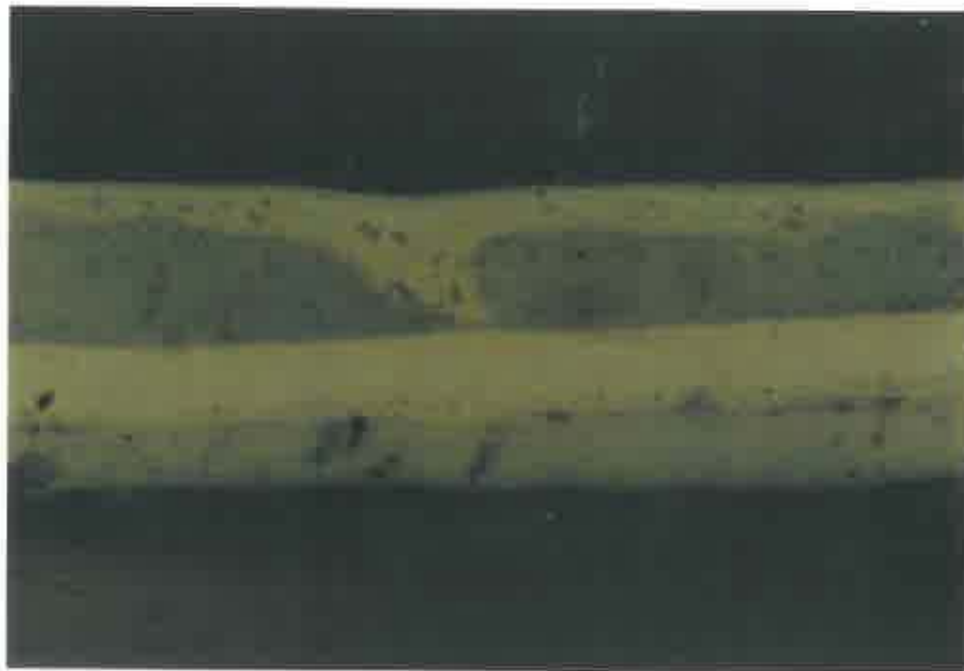
Visible Light 125X



Ultraviolet Light 250X



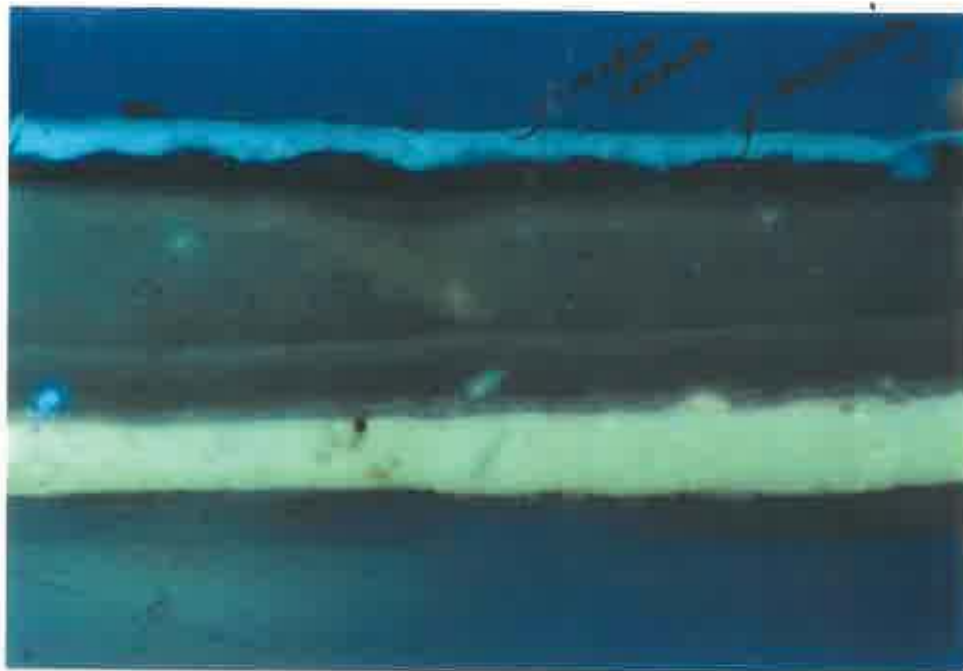
Sample 8 – East wall, rear edge of marbledized baseboard, on south chimney breast
Visible Light 125X (paints)



Visible Light 125X (substrate)



Sample 8 – East wall, rear edge of marbleized baseboard, on south chimney breast
Ultraviolet Light 125X (paints)



Ultraviolet Light 125X (substrate)



Window and Niche Trim:

On-site explorations with a 30X monocular microscope suggested the window architraves, the panels below the windows, and the moldings surrounding the niches were all painted in a similar manner, and were originally a monochromatic cream color. Eight samples were taken from pilaster and window trim elements to confirm all these elements were indeed all originally painted the same color. The best comparative example of the surviving first generation of paint was found in sample #3 from a bead molding on the south window on the east wall. This paint layer is identical to the original paint found in sample #2 from a plinth block, as noted in the preceding section.

Sample 3 – East wall, bead molding, left side of south window, approximately 3-feet up
Visible Light 125X



Ultraviolet Light 250X



Sample #13 from the central recessed portion of a pilaster appears to contain the complete paint history for the trim elements in this room. It has eight generations of paint beginning with the cream-colored paint found elsewhere in the room.

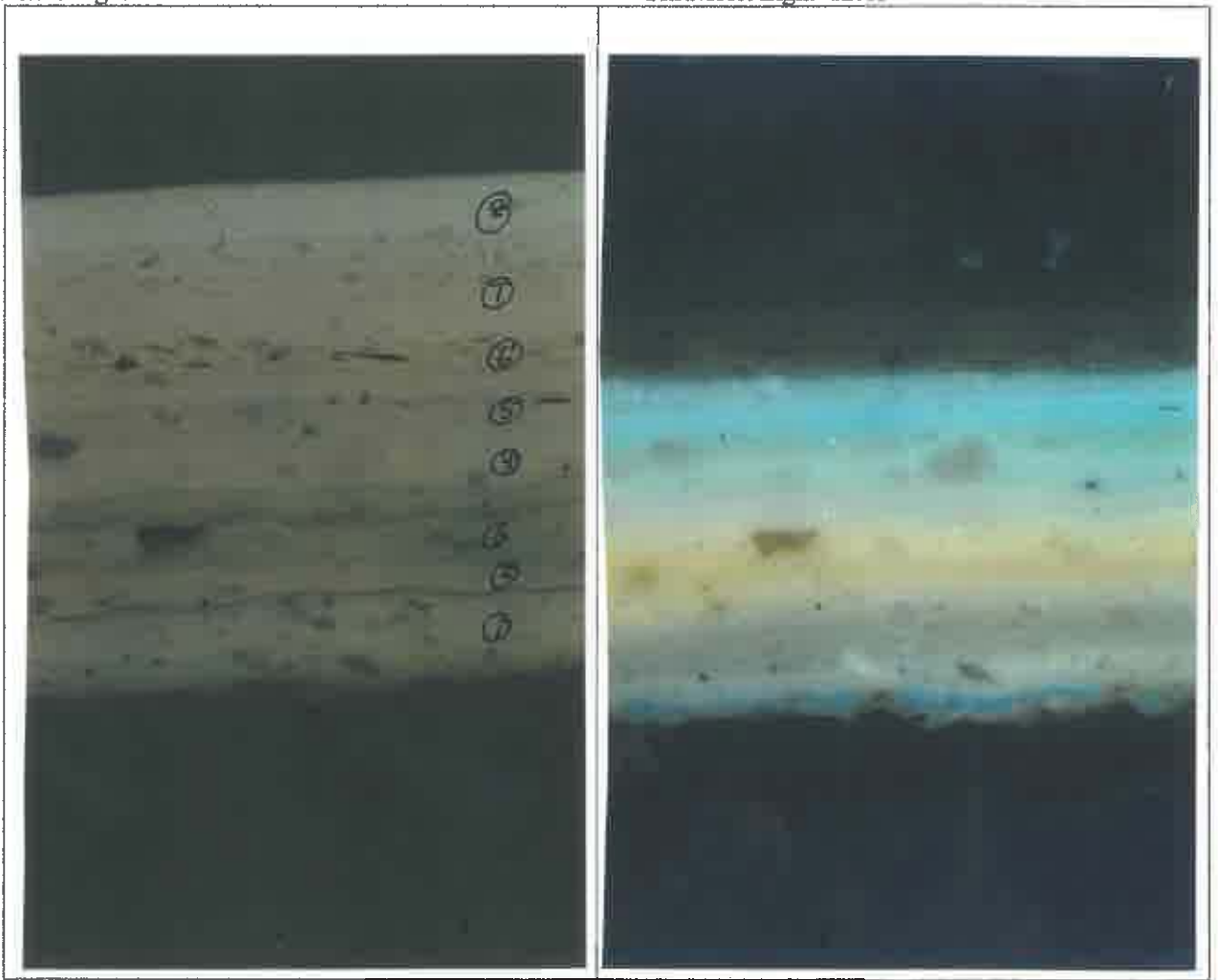
Sample #13 – North wall, central recessed element of left pilaster for northeast niche

<u>Layer</u>	<u>Generation</u>
White paint	8
Light cream-colored paint	7
Light cream-color paint	6
Off-white paint	5
Off-white paint	4
Tan paint	3
Dark cream-colored paint	2
Cream-colored paint	1
Shellac sealant	1
Wood	

Sample #13 – North wall, central recessed element of left pilaster for northeast

Visible Light 125X

Ultraviolet Light 125X



Skylight:

The skylight walls are now painted white with light blue bead moldings (that match the light blue on the cornice). The initial investigations on-site suggested the skylight walls could have been originally painted a different color than the walls of the room. Two samples were taken from this area to determine whether original paint evidence still survived and if so, what the original paint was. Samples #19 and #20 reveal the skylight walls and the bead moldings were painted with a light gray-blue whitewash, followed by unpigmented whitewash, and then three to four more generations of what appear to be comparatively modern paints. This whitewash (or limewash) paint on the skylight is different in composition from the oilbound paints on the walls. The skylight paint is typical of what would be found on ceilings and is considerably less durable than the wall paints. Although the ceiling in this room was not sampled because the current ceiling is a modern replacement, it is likely the ceiling paints were the same as the skylight paints.

Sample 19 – Skylight, central panel of west wall of skylight

Visible Light 125X



Ultraviolet Light 125X



Conclusion – Art Gallery Interior Paints

Despite the water damage sustained by the Art Gallery, the results of this analysis project indicate the original paints still survive on most key representative elements. The only elements that appear to be too degraded to interpret are the cornice fragments and the rosette. Additional on-site investigation may help to uncover more evidence, but it is unlikely, because these types of decorative elements are often only painted with ephemeral, water-soluble washes or distemper paints. The original palette of the room appears to have been quite subtle, with dark cream-colored walls, cream-colored wood trim, and light blue-gray whitewash on the walls of the skylight. The color matches for these elements follow this section of the report.

Aiken Rhett Art Gallery Original Interior Paints

<u>Element</u>	<u>Original Paint</u>
Walls and backs of niches	Dark cream colored oilbound paint
Skylight walls	Light gray-blue whitewash
Ceiling	Perhaps light gray-blue whitewash
Window trim, niche trim, baseboards	Cream colored oilbound paint
Cornice and rosette	Perhaps whitewashed or dark gray-blue – evidence is inconclusive

Aiken Rhett Art Gallery Original Interior Paints

Samples 14, 16 – Art Gallery walls and backs of niches

<u>Color System*</u>		<u>Coordinates</u>	
<u>Sample measurement 12-18-98</u>			
Munsell	Hue 6.0Y	Value 7.6V	Chroma 1.7C
CIE L*a*b*	Black to White L*77.16	Green to Red a*-1.96	Blue to Yellow b*+12.41
<u>Benjamin Moore #976</u>			
Munsell	Hue 6.1Y	Value 7.7V	Chroma 1.6C
CIE L*a*b*	Black to White L*78.29	Green to Red a*-1.88	Blue to Yellow b*+11.29

The ΔE value for the color difference between the commercial swatch and the sample is $\Delta E = 1.59$ which means it is well within the parameters for an acceptable printing industry match. It is also a very good visual match to the best preserved areas of the original paint.

Benjamin Moore #976



Sample 19 – Art Gallery skylight walls

<u>Color System*</u>		<u>Coordinates</u>	
<u>Benjamin Moore #1612</u>			
Munsell	Hue 0.5B	Value 8.0V	Chroma 0.2C
CIE L*a*b*	Black to White L*80.54	Green to Red a*-1.21	Blue to Yellow b*-0.50

Please note this sample was matched by eye under a 30X binocular microscope as the surviving skylight paint was so thin and uneven an accurate match with the color measurement instrument could not be obtained.

Benjamin Moore #1612



Samples 2, 3, 13 – Art Gallery window and niche trim, baseboards

<u>Color System*</u>		<u>Coordinates</u>	
<u>Sample measurement 12-18-98</u>			
Munsell	Hue 3.5Y	Value 7.8V	Chroma 1.6C
CIE L*a*b*	Black to White L*79.49	Green to Red a*-0.56	Blue to Yellow b*+11.70
<u>Benjamin Moore #966</u>			
Munsell	Hue 3.2Y	Value 8.1V	Chroma 1.8C
CIE L*a*b*	Black to White L*82.35	Green to Red a*-0.47	Blue to Yellow b*+12.34

The ΔE value for the color difference between the commercial swatch and the sample is $\Delta E = 2.9$ which means it is well within the parameters for an acceptable printing industry match. It is also a very good visual match to the best preserved areas of the original paint.

Benjamin Moore #966