

Point Pinos Lighthouse Paint Analysis Summary

2/29/2016

Bill Peake

Analysis No.	Sample No.	Analysis Date	Room	Location	Substrate	Top Color
1	1	15-Jul-12	Watch Room	window frame		
1	2	15-Jul-12	Watch Room	window sash		
1	3	15-Jul-12	Watch Room	window sill		
1	4	15-Jul-12	Watch Room	baseboard		
1	5	15-Jul-12	Watch Room	wall		
1	6	15-Jul-12	Stairwell	banister 1st floor		
1	7	15-Jul-12	Stairwell	below banister 1st floor		
1	8	15-Jul-12	Stairwell	stair riser 1st floor		
1	9	15-Jul-12	Stairwell	wall 1st floor		
2	10	19-Oct-12	Bedroom	wall above north window		
2	11	19-Oct-12	Bedroom	north window sash		
2	12	19-Oct-12	Bedroom	north window trim		
2	13	19-Oct-12	Bedroom	masonry		
2	14	19-Oct-12	Bedroom	fireplace mantle		
2	15	19-Oct-12	Bedroom	tongue & groove paneling		
3	16	5-Feb-13	Beach Patrol Room	flue exterior		
3	17	5-Feb-13	Beach Patrol Room	ceiling at light fixture		
3	18	5-Feb-13	Beach Patrol Room	closet door		
3	19	5-Feb-13	Beach Patrol Room	baseboard		
3	20	5-Feb-13	Beach Patrol Room	inside dormer casing		
4	21	4-Mar-13	Rear Porch	window frame		
4	22	4-Mar-13	Rear Porch	floor		
4	23	4-Mar-13	Rear Porch	west wall		
4	24	4-Mar-13	Rear Porch	top cellar stairs entry		
4	25	4-Mar-13	Rear Porch	cellar stairs wall		
5	26	26-Mar-13	WWII Room	dormer wall		
6	27	4-Jun-13	Kitchen	Middle - Plaster Wall	plaster	aqua
6	28	4-Jun-13	Kitchen	Middle Ceiling V Board	wood	aqua
6	29	4-Jun-13	Kitchen	Middle Ceiling Beadboard	wood	aqua
6	30	4-Jun-13	Kitchen	North Ceiling Beadboard	wood	aqua
6	31	4-Jun-13	Bath Hall	Wall Beadboard	wood	white
6	32	4-Jun-13	Bath Hall	Parlor Door Trim	wood	white
6	33	4-Jun-13	Bath	Wall V Board	wood	white
6	34	4-Jun-13	Bath	Wall Beadboard	wood	white
6	35	4-Jun-13	2nd Floor Hall	Wall	plaster	white
6	36	4-Jun-13	2nd Floor Hall	Watch Room Door Trim	wood	grey
7	37	6-Aug-13	Stairwell	step above 2nd floor hallway	wood	grey
7	38	6-Aug-13	Stairwell	1st floor paneling surrounding	wood	white
7	39	6-Aug-13	Stairwell	2nd floor weight column	metal	white
8	40	9-Sep-13	Rear Porch	East Wall board	wood	white
9	41	20-May-14	Front Hall	Door to Parlor - Door Trim	wood	grayish yellow
9	42	20-May-14	Front Hall	East Wall	plaster	yellow
9	43	20-May-14	Front Hall	Bead Board	wood	yellow
9	44	20-May-14	Reception	East closet door	wood	grayish green
9	45	20-May-14	Reception	East closet door trim	wood	grayish green
9	46	20-May-14	Reception	Picture rail	wood	grayish green
9	47	20-May-14	Reception	North wall	plaster	light green

9	48	20-May-14	Reception	Ceiling	plaster	light green
9	49	20-May-14	Reception	Base board north wall	wood	grayish green
9	50	20-May-14	Reception	Window trim west	wood	grayish green
9	51	20-May-14	Reception	East closet floor	wood	dark green
10	52	15-Jul-14	Reception	Base board west wall	wood	grayish green
11	53	11-Oct-14	Kitchen	Northeast corner white floor	wood	white
11	54	11-Oct-14	Kitchen	Northeast corner mastic floor	wood	grayish white/tan
12	55	8-Sep-15	Parlor	ceiling	plaster	cream
12	56	8-Sep-15	Parlor	closet door trim	wood	cream
12	57	8-Sep-15	Parlor	Baseboard north wall	wood	cream
12	58	8-Sep-15	Parlor	fireplace mantle	wood	cream
12	59	8-Sep-15	Parlor	South wall	plaster	cream
12	60	8-Sep-15	Parlor	South window frame	wood	cream
12	61	8-Sep-15	Cellar	T&G flooring	wood	gray

In the 70's there was a federally funded make work program that resulted in many of the inside surfaces of the lighthouse being stripped. Apparently the wall (plaster?) was not. Ken Hinshaw

Paint Analysis
Point Pinos Lighthouse
Pacific Grove, California
July 15, 2011

On Thursday, July 14, 2011 David Arbogast, architectural conservator, of Davenport, Iowa, received a set of nine paint samples from William Peake of Pacific Grove, California. The samples were collected from the Point Pinos Lighthouse in Pacific Grove by him on July 8, 2011 and were submitted for analysis to determine their historic colors.

Analysis of the paint samples was completed on Friday, July 15. Analysis was conducted using an optical Olympus microscope with magnification between 14 and 80 power. Each layer observed was color matched to the Munsell System of Color using natural north light. Only opaque, pigmented layers (i.e. paint layers) were matched. It is impossible to determine colors for finishes such as metallic paints and leafs and shellacs and varnishes because their color varies according to their translucency and reflectance.

The Munsell System of Color is a scientific system in which colors have been ranged into a color fan based upon three attributes: hue or color, the chroma or color saturation, and the value or neutral lightness or darkness. Unlike color systems developed by paint manufacturers, the Munsell system provides an unchanging standard of reference which is unaffected by the marketplace and changing tastes in colors.

The hue notation, the color, indicates the relation of the sample to a visually equally spaced scale of 100 hues. There are 10 major hues, five principal and five intermediate within this scale. The hues are identified by initials indicating the central member of the group: red R, yellow-red YR, yellow Y, yellow-green YG, green G, blue-green BG, blue B, purple-blue PB, purple P, and red-purple R. The hues in each group are identified by the numbers 1 to 10. The most purplish of the red hues, 1 on the scale of 100, is designated as 1R, the most yellowish as 10R, and the central hue as 5R. The hue 10R can also be expressed as 10, 5Y as 25, and so forth if a notation of the hue as a number is desired.

Chroma indicates the degree of departure of a given hue from the neutral gray axis of the same value. It is the strength of saturation of color from neutral gray, written /0 to /14 or further for maximum color saturation.

Value, or lightness, makes up the neutral gray axis of the color wheel, ranging from black, number 1, to white at the top of the axis, number 10. A visual value can be approximated by the help of the neutral gray chips of the Rock or Soil Color chart with ten intervals. The color parameters can be expressed with figures semi-quantitatively as: hue, value/chroma (H, V/C). The color "medium red" should serve as an example for presentation with the three color attributes, 5R 5.5/6. This means that 5R is located in the middle of the red hue, 5.5 is the lightness of Munsell value near the middle between light and dark, and 6 is the degree of the Munsell chroma, or the color saturation, which is about in the middle of the saturation scale.

The samples were collected in manila coin envelopes with pertinent identification information written on the faces of the envelopes. Although they were unusually small in size, the samples ranged from good to excellent in condition. Their discussion lists the layers from the most recent at the top to the oldest at the bottom of the list. The results obtained, are as follow:

Sample 1	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/

The first sample was collected from the watch room window frame. It revealed a set of extremely thin layers of white paint. Although the precise number of layers could not be determined because of their similarity, there were at least eight layers observed.

Sample 2	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/

The second sample was removed from the watch room sash. It proved to be identical to its counterpart, the first sample.

Sample 3	Munsell
Gray	N 6.0/
Light gray	N 7.5/
Dark gray	N 3.5/
Gray	N 5.0/
Dark gray	N 3.5/
Light gray	N 7.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/

The third sample came from the sill of the watch room. Beneath a collection of gray paint layers of varying shades was a set of at least four very thin layers of white paint.

Sample 4	Munsell
Gray	N 6.0/
Light gray	N 7.5/
Dark gray	N 3.5/
Gray	N 5.0/
Tan	2.5Y 7/4

The fourth sample was taken from the baseboard of the watch room. Its top four layers matched those of the third sample. Beneath these four layers was a tan layer. Given the location of the sample, it is quite possible that earlier paint may have worn off or may have been otherwise removed from the wood substrate.

Sample 5	Munsell
White	N 9.5/
Off-white	2.5Y 8.5/1
White	N 9.5/
Blue-gray	10BG 6/1
Off-white	2.5Y 8.5/1
Rose	7.5R 6/4
White	N 9.5/

The fifth sample was obtained from the wall of the watch room. It revealed a great variety of colors. The oldest white layer was relatively thick and distinct. It was probably not a prime coat for the rose-colored layer.

Sample 6	Munsell
Very dark brown	5YR 2/2
Very dark brown	5YR 2.5/4
Very dark brown	5YR 3/1
Very dark brown	5YR 3/1
Very dark brown	5YR 3/1
Very dark brown	5YR 2/2
Light gray	N 7.5/

The sixth sample was from the banister of the lower stairwell. It retained a collection of six very dark brown layers, which varied slightly in tone. At the base was a distinct layer of light gray paint which is the apparent original color.

Sample 7	Munsell
White	N 9.5/

The seventh sample was found below the banister on the lower stairwell. It retained only a single layer of white latex paint.

Sample 8	Munsell
Charcoal	N 1.0/
Dark gray	N 4.5/
Charcoal	N 1.0/
Dark gray	N 4.5/
Dark gray	5Y 4/1

The eighth sample was collected from a riser of the stair in the lower stairwell. It had a series of pairs of dark gray and charcoal gray layers above an oil-based coat of dark gray which had shifted to the yellow end of the spectrum over time because of its oil content.

Sample 9	Munsell
White	N 9.5/
Off-white	2.5Y 8.5/1
Off-white	2.5Y 8.5/1
Blue-gray	5B 5/1
Blue-gray	5B 5/1
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
Khaki	5Y 6/4

The ninth sample was removed from the wall of the lower stairwell. It revealed a set of ten paint layers of which the oldest was a relatively thick and distinct yellowish-green color similar to khaki.

Second Paint Analysis
Point Pinos Lighthouse
Pacific Grove, California
October 19, 2012

On Wednesday, October 17, 2012 David Arbogast, architectural conservator, of Davenport, Iowa, received a set of six paint samples from William Peake of Pacific Grove, California. The samples were collected from the Point Pinos Lighthouse in Pacific Grove by him on October 9, 2012 and were submitted for analysis to determine their historic colors. Prior to this a set of nine samples was analyzed on July 15, 2012 from the lighthouse. The reader is advised to consult the prior analysis in conjunction with this.

Analysis of the paint samples was completed on Friday, October 17. Analysis was conducted using the same methodology employed in the previous analysis. The samples were collected in manila coin envelopes with pertinent identification information written on the faces of the envelopes. Because they were unusually small in size, the samples ranged from challenging to excellent in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 10	Munsell
Pink	2.5YR 7/6
Cream	2.5Y 8.5/3
Dark green	5G 4/4
Light gray	5Y 7/1
Cream	2.5Y 8.5/3
Light brown	2.5Y 6/4
White	N 9.5/
Light blue	5BG 8/1

The tenth sample was collected from the bedroom wall above the north window. It was particularly challenging, consisting of multiple bits of paint with contradictory seriation. A bit of the sample containing what appeared to be the most complete set of layers was analyzed and revealed the layers listed above. All but the two oldest layers appear to be typical paint layers. The white layer was extremely thick and grainy, which is very typical of whitewash. The light blue layer beneath it was relatively irregular and grainy and may have been a calcimine layer as opposed to a typical oil paint.

Sample 11	Munsell
White	5Y 9/1
Cream	2.5Y 8.5/3

The eleventh sample was removed from the north window sash of the bedroom. It retained two layers of paint on its wood substrate.

Sample 12	Munsell
White	5Y 9/1
Cream	2.5Y 8.5/3

The twelfth sample came from the north window trim of the bedroom. Not surprisingly, it matched its counterpart, sample 11.

Sample 13	Munsell
White	5Y 9/1
Pink	2.5YR 7/6
Cream	2.5Y 8.5/3
Dark green	5G 4/4
Light gray	5Y 7/1
Cream	2.5Y 8.5/3
Light brown	2.5Y 6/4
Brown	7.5YR 5/5
Dark brown	7.5YR 3/2
White	5Y 9/1

The thirteenth sample was taken from the masonry of the bedroom fireplace. Beneath a layer of white paint was a set of six layers matching the top six layers of sample 10. The oldest layer was a relatively thick layer of white paint.

Sample 14	Munsell
Pink	2.5YR 8.5/4
Black	N 1.0/
White	5Y 9/1
White	5Y 9/1
White	5Y 9/1
Cream	2.5Y 8.5/3
Black	N 1.0/

The fourteenth sample was obtained from the mantle of the bedroom fireplace. It did not resemble its counterpart, sample 13, and revealed considerably more paint layers than the other two woodwork samples, nos. 11 and 12. In this case there was a very distinct black layer beneath the layer of cream paint.

Sample 15	Munsell
White	5Y 9/1
Cream	2.5Y 8.5/3
Light blue	10BG 8/1

The fifteenth sample was from the tongue-and-groove paneling of the bedroom. In addition to the white and cream layers observed on samples 11 and 12 there was an older layer of light blue which was quite similar, although not identical, to that observed in sample 10.

Third Paint Analysis
Point Pinos Lighthouse
Pacific Grove, California
February 5, 2013

On Monday, February 4, 2013 David Arbogast, architectural conservator, of Davenport, Iowa, received a set of five paint samples from William Peake of Pacific Grove, California. The samples were collected from war room of the Point Pinos Lighthouse in Pacific Grove by him on January 31, 2013 and were submitted for analysis to determine their historic colors. Prior to this a set of nine samples was analyzed on July 15, 2012 from the lighthouse followed by a set of six samples on October 19. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the paint samples was completed on Tuesday, February 5. Analysis was conducted using the same methodology employed in the previous analysis. The samples were collected in manila coin envelopes with pertinent identification information written on the faces of the envelopes. Because they were unusually small in size, the samples ranged from challenging to excellent in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 16	Munsell
White	N 9.5/
Cream	2.5Y 8.5/3
Cream	2.5Y 8/4
White	N 9.5/
Pink	10YR 8/3
Light green	2.5G 8/2
Green	2.5G 5/2
Light green	2.5G 8/2
Light green	2.5GY 7/2
Light green	2.5G 7/2
White	5Y 9/1
Off-white	10YR 8/1
Off-white	10YR 8/1
Off-white	10YR 8/1
Off-white	10YR 8/1
Golden varnish	-----
Cream	2.5Y 8.5/3

The sixteenth sample was collected from the flue exterior. Although it was quite challenging, it revealed an extremely large number of layers. The top two layers were completely detached from the remaining layers. The top white layer was an extremely flexible layer of latex paint. Directly above the oldest layer of cream-colored paint was a distinct layer of golden varnish, which may have aged to that color. Its application on a plaster surface is atypical.

Sample 17	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
Dark gray	5Y 5/1

The seventeenth sample was removed from the ceiling. Beneath a set of slightly off-white paint layers was a distinct layer of dark gray paint.

Sample 18	Munsell
White	N 9.5/
Pink	10YR 8/3
Light green	2.5G 8/2
Green	2.5G 5/2
Light green	2.5G 8/2
Light green	2.5GY 7/2
Light green	2.5G 7/2
Cream	2.5Y 8/4
White	5Y 9/1

The eighteenth sample came from the closet door. It proved to be similar to the sixteenth sample, but without the oldest six layers of that sample. The oldest white layer was quite thin and probably served as a prime coat for a finish coat of cream-colored paint.

Sample 19	Munsell
White	5Y 9/1
Cream	2.5Y 8/4

The nineteenth sample was taken from the baseboard. It revealed only two layers of paint on its wood surface. The cream layer matched the cream layer seen in the previous sample.

Sample 20	Munsell
White	5Y 9/1
Cream	2.5Y 8/4

The twentieth sample was obtained from the inside dormer casing. It matched sample nineteen.

Of the five samples, sample 16 was, by far, the most complete sample. Sample 17 was unique. Had it retained a greater number of layers it might be reasonable to think that dark gray was the historic color. The other three samples appeared to relate to sample 16, but were considerably less complete.

Fourth Paint Analysis
Point Pinos Lighthouse
Pacific Grove, California
March 4, 2013

On Thursday, February 28, 2013 David Arbogast, architectural conservator, of Davenport, Iowa, received a set of five paint samples from William Peake of Pacific Grove, California. The samples were collected from the rear porch of the Point Pinos Lighthouse in Pacific Grove by him on February 19, 2013 and were submitted for analysis to determine their historic colors. Prior to this a set of nine samples was analyzed on July 15, 2012 from the lighthouse followed by a second set of six samples on October 19 and a third set of samples on February 4, 2013. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the paint samples was completed on Monday, March 4. Analysis was conducted using the same methodology employed in the previous analyses. The samples were collected in manila coin envelopes with pertinent identification information written on the faces of the envelopes. As with the previous samples, these ranged from challenging to excellent in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 21	Munsell
White	N 9.5/
White	N 9.5/
Tan	10YR 7/5
Black stain	N 1.5/

Sample 21 was collected from the window frame. Beneath a pair of stark white and a tan layer the wood was stained black. Black was a very popular color for window sash, although not the frames around the sash, in the early decades of the twentieth century.

Sample 22	Munsell
Maroon	10R 3/4
Gray	5Y 5/1
Light brown	10YR 6/4
Light brown	10YR 6/4

Sample 22 was removed from the floor. The four surviving layers were quite distinct. Gray and light brown are typical colors used on porch floors.

Sample 23	Munsell
Tan	10YR 8/4
Ochre	10YR 7/8
Tan	10YR 7/5
Tan	10YR 7/5
Tan	10YR 7/5
Gray	N 5.0/
Gray	N 5.5/
Gray	N 5.5/
Gray	N 5.5/
Gray	N 5.5/
Gray	N 5.5/
Gray	N 6.0/
Gray	N 5.5/
Gray	N 5.5/
White	5Y 9/1
Brown	10YR 5/4

Sample 23 ~~came from the west wall~~ was taken from the top of the cellar stairwell entrance. Its quality was outstanding with clearly discernible layers. The oldest brown layer was extremely thin and probably served as a prime coat for a finish coat of white.

Sample 24	Munsell
Green	10GY 6/4
Green	10GY 6/4
Golden varnish	-----
Paper	-----

Sample 24 ~~was taken from the top of the cellar stairwell entrance~~ came from the west wall. Atop a paper substrate was a thick layer of golden varnish not unlike that observed in sample 16 of the previous analysis. Above the varnish was a pair of green paint layers.

Sample 25	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
Maroon	10R 3/4
Maroon	10R 3/4
Gray	N 5.0/
Dark gray	N 3.5/
Gray	N 5.5/
Gray	N 5.5/
White	5Y 9/1
Brown	10YR 5/4

Sample 25 was obtained from the cellar stairwell wall. It bore some similarities to sample 23, ~~which also came from a wall~~. There was complete delamination between the older maroon layer and the gray layer of paint beneath it. The oldest gray layers were identical as well as the oldest white and brown layers. Again, the brown layer was quite thin and may have served as a prime coat for the finish coat of white.

Fifth Paint Analysis
Point Pinos Lighthouse
Pacific Grove, California
March 26, 2013



On Monday, March 25, 2013 David Arbogast, architectural conservator, of Davenport, Iowa, received a paint sample from William Peake of Pacific Grove, California. The sample was collected from the dormer wall of the WWII Room of the Point Pinos Lighthouse in Pacific Grove by him on March 20, 2013 and was submitted for analysis to determine its historic colors. Prior to this a set of nine samples was analyzed on July 15, 2012 from the lighthouse followed by a second set of six samples on October 19 followed by a third set of samples on February 4, 2013 and a fourth set of five on March 4, 2013. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the paint samples was completed on Monday, March 26. Analysis was conducted using the same methodology employed in the previous analyses. The sample was collected in a manila coin envelope with pertinent identification information written on the face of the envelope. This samples was excellent in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 26	Munsell
White	N 9.5/
Cream	2.5Y 8/4
Pink	2.5YR 8/4
Light green	7.5GY 8/2
Blue	10BG 6/1
Light green	5G 8/2
Beige	10YR 8/2
White	N 9.5/
Brown	2.5Y 6/4

Sample 26 revealed nine distinct layers. The oldest brown layer was extremely thin. If it was on a wood substrate one might be inclined to think of it as a dark varnish. If it were white, then one might conclude that it was a prime paint. Brown is not a typical prime coat color and its extreme thinness is not typical of a finish coat of paint.

Sixth Paint Analysis
Point Pinos Lighthouse
Pacific Grove, California
June 4, 2013



On Friday, May 31, 2013 David Arbogast, architectural conservator, of Davenport, Iowa, received a set of ten paint samples from William Peake of Pacific Grove, California. The samples were collected from the interior of the Point Pinos Lighthouse in Pacific Grove by him on May 23, 2013 and were submitted for analysis to determine their historic colors. Prior to this a set of nine samples was analyzed on July 15, 2012 from the lighthouse followed by a second set of six samples on October 19 followed by a third set of samples on February 4, 2013 a fourth set of five on March 4, 2013, and a single sample on Monday March 25. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the paint samples was completed on Tuesday, June 4. Analysis was conducted using the same methodology employed in the previous analyses. The samples were collected in manila coin envelopes with pertinent identification information written on the faces of the envelopes. The samples ranged from fair to excellent in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 27
Green

Munsell
2.5G 6/4

Sample 27 was collected from the plaster wall of the kitchen. It retained a single layer of green paint on its surface in excellent condition.

Sample 28	Munsell
Green	2.5G 6/4
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
White	5Y 9/1
Off-white	2.5Y 9/2
Light green	2.5G 7/2
Pale green	10GY 8/1

Sample 28 was from the middle ceiling V-board of the kitchen. It revealed a set of eight paint layers, of which the oldest was a thin gray-green layer.

Sample 29	Munsell
Green	2.5G 6/4
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
Varnish	-----
White	5Y 9/1
Off-white	2.5Y 9/2

Sample 29 was taken from the middle ceiling beadboard of the kitchen. It was similar to the previous sample, but lacked the two oldest layers seen in that sample and had a thin layer of brown varnish above the white layer. This varnish caused the paint to delaminate at that point.

Sample 30	Munsell
Green	2.5G 6/4
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
Varnish	-----
White	5Y 9/1
Off-white	2.5Y 9/2
Light green	2.5G 7/2
Light gray-green	5GY 7/1
White	5Y 9/1
Cream	2.5Y 8/3

Sample 30 came from the north ceiling beadboard of the kitchen. It combined all of the layers seen in the previous two samples with an additional two older layers. The older white layer was quite thick and the cream layer was not thin as in a prime coat.

Sample 31	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
Ochre	2.5Y 7/6
White	N 9.5/
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
White	5Y 9/1
Off-white	2.5Y 9/2
White	5Y 9/1

Sample 31 was removed from the beadboard of the wall of the bath hallway. With the exception of the ochre layer, all of the paint layers were variations of white and off-white with an oil-based white paint as the oldest layer.

Sample 32	Munsell
White	N 9.5/
Off-white	2.5Y 9/2

Sample 32 was obtained from the parlor door trim of the bath hallway. There were only two paint layers on its wood substrate.

Sample 33	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
Cream	2.5Y 8/4
White	N 9.5/
Off-white	2.5Y 9/2
White	5Y 9/1

Sample 33 was collected from the wall V-board of the bath. It was similar to sample 31. However, rather than an ochre layer there was a cream layer and there were fewer layers beneath than were observed beneath the ochre layer of sample 31.

Sample 34	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
Cream	2.5Y 8/4
White	N 9.5/
Off-white	2.5Y 9/2
Off-white	2.5Y 9/2
White	5Y 9/1

Sample 34 was from the wall beadboard of the bath. It was virtually identical to sample 33, but with an additional layer of off-white.

Sample 35	Munsell
White	N 9.5/
White	N 9.5/
Off-white	2.5Y 9/2
White	N 9.5/
White	N 9.5/
White	N 9.5/
Off-white	2.5Y 9/2
Tan	2.5Y 7/4
White	5Y 9/1
Off-white	2.5Y 9/2
White	5Y 9/1
White	5Y 9/1
Gray	N 5.0/

Sample 35 was taken from the wall of the second-floor hall. It revealed a relatively standard set of white and off-white paint layers with an intermediate layer of tan. The surprise came with the oldest layer, which was a strong gray. It was variable in its thickness, accommodating the relatively uneven plaster surface.

Sample 36	Munsell
Gray	N 6.5/
White	5Y 9/1

Sample 36 came from the watch room door trim of the second-floor hall. It retained only a pair of paint layers with white being the older of the two.

Seventh Paint Analysis

Point Pinos Lighthouse

Pacific Grove, California

August 6, 2013



On Monday, August 5, 2013 David Arbogast, architectural conservator, of Davenport, Iowa, received a set of three paint samples from William Peake of Pacific Grove, California. The samples were collected from the interior of the Point Pinos Lighthouse in Pacific Grove by him in July of 2013 and were submitted for analysis to determine their historic colors. Prior to this a set of nine samples was analyzed on July 15, 2011 from the lighthouse followed by a second set of six samples on October 19 followed by a third set of samples on February 4, 2013, a fourth set of five on March 4, 2013, a single sample on Monday March 25, and a set of ten samples on June 4, 2013. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the paint samples was completed on Tuesday, August 6. Analysis was conducted using the same methodology employed in the previous analyses. The samples were collected in manila coin envelopes with pertinent identification information written on the faces of the envelopes. The samples ranged from fair to excellent in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 37	Munsell
Gray	N 5.25/
Dark gray	N 4.0/
Off-white	N 8.5/
Gray	N 5.25/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
Gray	N 5.25/
Charcoal	N 2.5/
Gray	N 5.25/
Dark gray	N 4.0/
Light gray	N 6.0/
Gray	N 5.25/
Maroon	10R 3/6
Varnish?	-----

Sample 37 was collected on July 2 from the stairs from the second floor to the lantern. The sample was quite excellent in its quality. Nineteen distinct paint layers were observed. These were well-adhered to each other and were in very good condition. Beneath the oldest maroon layer a pinkish color was observed which varied considerably in intensity and in coverage. It may have been a prime coat. There were also microscopic bits of what appeared to be varnish, which was a common prime coat for wood.

Sample 38	Munsell
White	N 9.5/
Off-white	2.5Y 8.5/2
Off-white	2.5Y 8.5/2
Khaki	5Y 7/4
White	N 9.5/
White	N 9.5/
White	N 9.5/
White	N 9.5/
Yellow	5Y 8/4
White	5Y 9/1

Sample 38 was removed on July 30 from the first floor board surrounding the column. It was fractured into three distinct segments. The most recent segment had a thin layer of white latex paint on its surface with a pair of off-white layers beneath it. The oldest segment had a yellow layer above a white layer which was firmly bonded to the wood substrate. The third segment consisted of a khaki layer attached to a set of four white

layers. Beneath the white layer were traces of the yellow layer leading to the conclusion that the khaki probably was the upper layer of the set. This khaki layer was lighter than the khaki layer observed in sample 9 and the yellow layer was lighter than this khaki layer.

Sample 39	Munsell
White	N 9.5/
Off-white	2.5Y 8.5/2
Off-white	2.5Y 8.5/2
Khaki	5Y 7/4
Off-white	2.5Y 8.5/2
Off-white	2.5Y 8.5/2
Off-white	2.5Y 8.5/2
Off-white	2.5Y 8.5/2

Sample 39 was taken on July 31 from the second floor weight column. There were two distinct segments to this sample. The most recent segment matched that of sample 38. It was completely delaminated from the other segment which was similar to the third segment of sample 38. However, instead of a set of four white layers attached to the khaki layer there was a set of four off-white layers. The upper three of these layers had distinct, extremely thin, dirt layers between them. Unfortunately, because of the metal substrate of the sample there was no evidence of any older layers as in the case of sample 38.

Eighth Paint Analysis

Point Pinos Lighthouse

Pacific Grove, California

September 25, 2013



On Friday, September 20, 2013 David Arbogast, architectural conservator, of Davenport, Iowa, received a paint sample from William Peake of Pacific Grove, California. The samples were collected from the interior of the Point Pinos Lighthouse in Pacific Grove by him in July of 2013 and were submitted for analysis to determine their historic colors. Prior to this a set of nine samples was analyzed on July 15, 2011 from the lighthouse followed by a second set of six samples on October 19 followed by a third set of samples on February 4, 2013, a fourth set of five on March 4, 2013, a single sample on Monday March 25, a set of ten samples on June 4, 2013, and a set of three paint samples on August 5, 2013. The reader is advised to consult the prior analyses in conjunction with this.

Analysis of the sample was completed on Wednesday, September 25 using the same methodology employed in the previous analyses. The sample was collected in manila coin envelopes with pertinent identification information written on the face of the envelope. The sample was good in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 40	Munsell
White	N 9.5/
White	N 9.5/
White	N 9.5/
Green	2.5G 6/4
Light green	2.5G 7/4
Varnish	-----

Sample 40 was collected on September 14 from the east wall of the rear porch. It is closely related to sample 24 from the west wall of the same porch. In this case there were at least three observable layers of white paint on top of the pair of green and light green layers. There was a thin layer of varnish on the wood substrate.

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Ninth Paint Analysis
Point Pinos Lighthouse
Pacific Grove, California
May 30, 2014



On Saturday, May 23, 2014, David Arbogast, architectural conservator, of Davenport, Iowa, received a set of eleven paint samples from William Peake of Pacific Grove, California. The samples were collected from the interior of the Point Pinos Lighthouse in Pacific Grove by him on May 20, 2014, and were submitted for analysis to determine their historic colors. Prior to this an initial set of nine samples was analyzed on July 15, 2011 from the lighthouse followed by a second set of six samples on October 19, then a third set of samples on February 4, 2013, a fourth set of five on March 4, 2013, a single sample on Monday March 25, a set of ten samples on June 4, 2013, a set of three paint samples on August 5, 2013, and a single sample on September 25, 2013. The reader is advised to consult the prior analyses in conjunction with this.

Analysis of the samples was completed on Thursday, May 29, using the same methodology employed in the previous analyses. The samples were collected in manila coin envelopes with pertinent identification information written on the faces of the envelopes. The sample ranged from challenging to good in condition. Numbering follows that of the previous analysis. The results obtained, are as follow:

Sample 41	Munsell
Cream	2.5Y 8/2
White	N 9.5/

Sample 41 was collected from the door trim of the door to the parlor from the front hall. Its wood substrate retained two thin layers of paint with cream (described as grayish yellow in the accompanying letter to the samples) as its top layer. Beneath it was a stark white layer which could have served as a prime coat.

Sample 42	Munsell
Pale yellow	2.5Y 9/3
White	N 9.5/
White	N 9.5/
Rose	10R 6/4

Pink	10R 8.5/3
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Sample 42 was from the east wall of the front hall. It was a fragile sample which revealed five paint layers. The oldest layer was pink which was probably a finish coat and not a prime coat.

Sample 43	Munsell
Pale yellow	2.5Y 9/3
White	N 9.5/

Sample 43 came from the bead board of the front hall. It revealed the top two paint layers seen in the previous sample. Between the white layer and the wood there were traces of what appeared to be dirt.

Sample 44	Munsell
Light green	5GY 8/1
White	N 9.5/

Sample 44 was found on east closet door of the reception room. There were two thin paint layers on its wood surface with white being the older of the two, as in samples 41 and 43.

Sample 45	Munsell
Light green	5GY 8/1
White	N 9.5/

Sample 45 was removed from the east closet door trim of the reception room. It matched its counterpart, sample 44, precisely.

Sample 46	Munsell
Light green	5GY 8/1
White	N 9.5/

Sample 46 was obtained from the picture rail of the reception room. It was identical to samples 44 and 45.

Sample 47	Munsell
Pale green	5GY 9/1
White	N 9.5/
Pink	10R 7/2
Light green	2.5G 8/2
Yellow	2.5Y 8.5/5
Blue	5BG 6/1
Light blue	5BG 8/1
Light blue	5BG 8/1
Light blue	5BG 8/1
White	5Y 9/1
Cream	2.5Y 8/2
Cream	2.5Y 8/2

Sample 47 was acquired from the north wall of the reception room. It was a fragile sample with delamination occurring between the two oldest light blue layers. All told a set of a dozen paint layers was observed. The blue layer was the most interesting layer. It appeared on one portion of the sample only with a very distinct edge. There is a very high probability that it was applied in a

decorative fashion such as stenciling. The oldest pair of cream layers, interestingly, was very similar in color to the top layer of sample 41.

Sample 48	Munsell
Pale green	5GY 9/1
White	N 9.5/
White	N 9.5/
White	N 9.5/
Cream	2.5Y 8/2
Cream	2.5Y 8/2

Sample 48 was collected from the ceiling of the reception room. It appears that the ceiling was painted less frequently than the walls, which is typical, and that it was not painted in the same colors as the walls except for the most recent and the oldest pairs of layers.

Sample 49	Munsell
Light green	5GY 8/1
White	N 9.5/

Sample 49 was from the north wall baseboard of the reception room. It matched its counterparts, samples 44, 45, and 46.

Sample 50	Munsell
Light green	5GY 8/1
White	N 9.5/

Sample 50 came from the west window trim of the reception room. It matched its counterparts, samples 44, 45, 46, and 47, layer for layer.

Sample 51	Munsell
Very dark green	10GY 3/4
Charcoal gray	N 3.0/
Gray	N 5.5/
Charcoal gray	N 3.0/

Sample 51 was found on the northeast closet floor of the reception room. It revealed four paint layers, all of which are relatively common colors used to paint floors, especially softwood floors or floors exposed to weathering.

Ninth Paint Analysis

Point Pinos Lighthouse

Pacific Grove, California

July 21, 2014



On Saturday, July 18, 2014, David Arbogast, architectural conservator, of Davenport, Iowa, received a paint sample from William Peake of Pacific Grove, California. The sample was collected from the interior of the Point Pinos Lighthouse in Pacific Grove by him on July 15, 2014, and was submitted for analysis to determine its historic color. Prior to this an initial set of nine samples was analyzed on July 15, 2011 from the lighthouse followed by a second set of six samples on October 19, then a third set of samples on February 4, 2013, a fourth set of five on March 4, 2013, a single sample on Monday March 25, a set of ten samples on June 4, 2013, a set of three paint samples on August 5, 2013, a single sample on September 25, 2013, and a set of eleven samples on May 30, 2014. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the sample was completed on Monday, July 21, using the same methodology employed in the previous analyses. The sample was collected in a manila coin envelope with pertinent identification information written on its face. The sample was in fair condition. Although there were multiple pieces of the sample, all but one piece did not contain a complete set of layers. Numbering follows that of the previous analysis. The result obtained, is as follows:

Sample 52	Munsell
Off-white	10Y 8/1
Dark gray	N 3.75/
Gray	N 5.25/
Gray	N 5.25/
Gray	N 5.25/
Thin light olive	5GY 7/1
Dark gray	N 3.75/
Light pink	2.5YR 8/2
Off-white	N 9/
Light cream	5Y 9/2
Brown, glossy varnish	-----
Light gray	5Y 7.5/1
Cream	2.5Y 8.5/2
Cream	2.5Y 8.5/2
Glossy varnish	-----

The sample came from the base board of the north wall of the reception room. The sample revealed fifteen distinct finish layers. The oldest layers of the sample were most difficult to determine. From observing two of the various pieces of the sample containing the wood substrate, it was determined that an original varnish was present. This varnish was not evident on the main sample; rather, there was a light tan color, but it was difficult to distinguish whether it was paint, varnish, or residue of the wood sticking to the first layer of paint. This tan color matched Munsell 10YR 7.5/4. It is most likely then, that the oldest and presumably original finish of the wood was a clear varnish. Historically, a layer of varnish was used in exterior applications as a prime coat, and even though this is an interior sample, it is possible that the varnish was used as a prime coat, making the cream color the original finish color.

Tenth Paint Analysis

Point Pinos Lighthouse

Pacific Grove, California

October 21, 2014



On Monday, October 20, 2014, David Arbogast, architectural conservator, of Davenport, Iowa, received two paint samples from William Peake of Pacific Grove, California. The samples were collected from the interior of the Point Pinos Lighthouse in Pacific Grove by him on October 11, 2014, and were submitted for analysis to determine their historic color. Prior to this an initial set of nine samples was analyzed on July 15, 2011 from the lighthouse followed by a second set of six samples on October 19, then a third set of samples on February 4, 2013, a fourth set of five on March 4, 2013, a single sample on Monday March 25, a set of ten samples on June 4, 2013, a set of three paint samples on August 5, 2013, a single sample on September 25, 2013, a set of eleven samples on May 30, 2014, and a single sample on July 21, 2014. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the samples was completed on Tuesday, October 21, using the same methodology employed in the previous analyses. Both samples were collected in manila coin envelopes with pertinent identification information written on their faces. The samples were in fair condition. Numbering follows that of the previous analyses. The results obtained, are as follow:

Sample 53
White

Munsell
N 9.5/

Sample 53 was collected from the northeast corner of the kitchen floor. The sample revealed only one stark white layer above the abraded wood substrate. Finishes applied to wood floors typically receive significant amount of wear, leaving little certainty of the original finish.

Sample 54
Gray

Munsell
N 6.0/

Sample 54 was also collected from the northeast corner of the kitchen floor. This sample contained dark mastic as a result of being covered by linoleum in later years. The sample generally revealed no finish coats beneath the mastic; however there was one small section which contained a single layer of gray under the mastic. Similar to the previous sample, the floor likely received much wear, leaving little of the original finish intact. Gray paint is a very possible original finish layer, but because of its inconsistency on the sample, provides little certainty.

Eleventh Paint Analysis

Point Pinos Lighthouse

Pacific Grove, California
September 21, 2015



On Monday, September 14, 2015, David Arbogast, architectural conservator, of Davenport, Iowa, received a set of seven paint samples from William Peake of Pacific Grove, California. The samples were collected from the interior of the Point Pinos Lighthouse in Pacific Grove by him on September 8, 2015, and were submitted for analysis to determine their historic colors. Prior to this an initial set of nine samples was analyzed on July 15, 2011 from the lighthouse followed by a second set of six samples on October 19, then a third set of samples on February 4, 2013, a fourth set of five on March 4, 2013, a single sample on Monday March 25, a set of ten samples on June 4, 2013, a set of three paint samples on August 5, 2013, a single sample on September 25, 2013, a set of eleven samples on May 30, 2014, a single sample on July 21, 2014, and a pair of samples on October 21, 2014. The reader is advised to consult the prior analyses in conjunction with this one.

Analysis of the samples was completed on Monday, September 21, using the same methodology employed in the previous analyses. All of the samples were collected in manila coin envelopes with pertinent identification information written on their faces. The samples were in fair condition. Numbering follows that of the previous analyses. The results obtained, are as follow:

Sample 55	Munsell
Off-white	2.5Y 9/2
White	N 9.0/
White	N 9.0/
White	N 9.0/
White	N 9.0/
White	N 9.0/
Light yellow	5Y 8/6

Sample 55 was collected from the Parlor ceiling. The sample had an off-white layer on its surface. Then it revealed several stark white layers above a single light yellow layer which seems to be the oldest applied to wood substrate.

Sample 56	Munsell
Glaze	-----
Cream	10YR 8/4
Cream	6.5Y 8/4

Sample 56 was removed from the Parlor closet door trim. This sample contained an extremely thin, very glossy glaze with a pair of cream layers beneath it.

Sample 57	Munsell
Glaze	-----
Cream	10YR 8/2
Off-white	5Y 9/1
Cream	10YR 8/2
Cream	10YR 8/2
Off-white	5Y 9/1
Cream	10YR 8/2
Cream	6.5Y 8/4

Sample 57 came from the north baseboard of the Parlor. The sample had multiple cream layers.

Sample 58	Munsell
Glaze	-----
Cream	2.5YR 8/2
Very dark blue	2.5B 2/2
Cream	2.5YR 8/2
Very dark blue	2.5B 2/2
Cream	6.5Y 8/4

Sample 58 was taken from the Parlor mantle. The sample was the only one to have dark blue layers as well a top glaze similar to several other samples tested.

Sample 59	Munsell
Tan	2.5Y 7/4
Yellow	2.5Y 8/6
Pink	5R 8/3
Pink	5R 8/3
White	N 8.75/
White	N 8.75/
Light green	10G 8/2
Red	5R 7/4
Pink	5R 8/3
Pink	5R 8/3
Light green	10G 8/2
Light green	10G 8/2
Light green	10G 8/2
Green	7.5G 5/2
Light yellow	7.5Y 9/2

Sample 59 was from the Parlor south wall. The sample revealed an extremely large number of paint layers. The oldest surviving layer found was light yellow.

Sample 60	Munsell
Tan	2.5Y 8.5/2
White	N 8.75/
Tan	2.5Y 8.5/2

Sample 60 was collected from the Parlor left window frame. This sample revealed only two colors in three layers of paint with the oldest surviving matching exactly the newest layer.

Sample 61	Munsell
Red	5R 3/4
Green	2.5G 4/2
Gray	N 4.5/

Sample 61 was collected from the tongue-and-groove wood floor of the cellar. The sample revealed three distinct finish colors on the wood. The oldest was gray paint, which is a very typical color used on floors.