CENTER FOR ART
MATERIALS ANALYSIS

January 21, 2011

Dear Mr. Saper:

This report summarizes the analysis of your painting Shooting Rock attributed to Winslow Homer. The materials in the painting are consistent with materials in use in the late 1890s into the early 1900s. Some of the materials identified have also been observed in the literature as paints from Homer's palette.

Painting Description
Photographs of the front and back of the painting are shown in Figures 1 through 4. The painting measures 36 x 24¼" (91.4 x 61.6 cm). There is evidence of multiple paint layers as evidenced by the detail in Figure 4 where a brown paint is a layer below the blue that is visible as the surface color.

Analysis
Each sample was analyzed using optical microscopy, FTIR microscopy and Raman microscopy. The use of multiple techniques provides different information about each sample. Optical microscopy provides information about pigment particle size, optical properties, homogeneity, and color. For the optical microscopy, a portion of the paint sample was transferred to a glass microscope slide for examination. The samples were each prepared for analysis by transferring a portion of the sample to a glass microscope slide. The sample was then covered with a coverslip and immersion oil (refractive index of 1.662) and examined with the microscope.

Fourier Transform Infrared (FTIR) microscopy provides information about the molecules present including the paint medium, organic pigments, and some inorganic pigments. For the FTIR analysis a fresh portion of each paint sample was transferred to a gold slide, which is suitable for reflecting the infrared light. A spectrum of each sample was collected to aid in identification of the paint medium and pigments. Spectra from the FTIR analysis are included with this report.

217 S Wilmette Ave.
Westmont IL 60559
630-430-3053
info@camaonline.net
www.camaonline.net

Raman microscopy compliments FTIR microscopy and provides key information for some samples such as the crystal form of some oxides (e.g. titanium dioxide, iron oxides). And it can be performed on areas as small as 1 micrometer which is often the same size as very finely ground pigments. The samples prepared for FTIR microscopy were used for this analysis as well. A Raman spectrum from each sample was collected with the Raman microscope system. All of the samples did not give useful Raman spectra, but spectra from the Raman analysis are included in with this report.

The pigments and paint detected in this painting are summarized in Table I. The pigments identified are consistent with those in use during the late 1890s and early 1900s. In all areas of the painting the paint is a drying oil medium. The use of cadmium based pigments by Homer was referenced in *Artist's Pigments* Volume 1, Robert Feller editor, p. 105. In Judith C. Walsh's article "Observations on Watercolor Techniques of Homer and Sargent" other pigments used by Homer were noted that included lead white, vermilion, and iron oxide based pigments. On the painting there is a material that looks similar to sand grains covering areas of the surf. This material was identified as starch grains. Much of the available literature related to Homer's palette focuses on his watercolors, so while there is similarity in colors used in this oil painting, it is not unexpected to see some different colors. Areas of paint that form the image of the rock and surf and thicker than the paint that is used for the sky and clouds, this may have been necessary as overpainting to hide underlying paint as evidenced by the paint layers at the edge of the painting.

Thank you for consulting the Center for Art Materials Analysis, Inc.

Sincerely,

Kenneth J. Smith Ph.D.
Reference: Project 2010-11-5-1

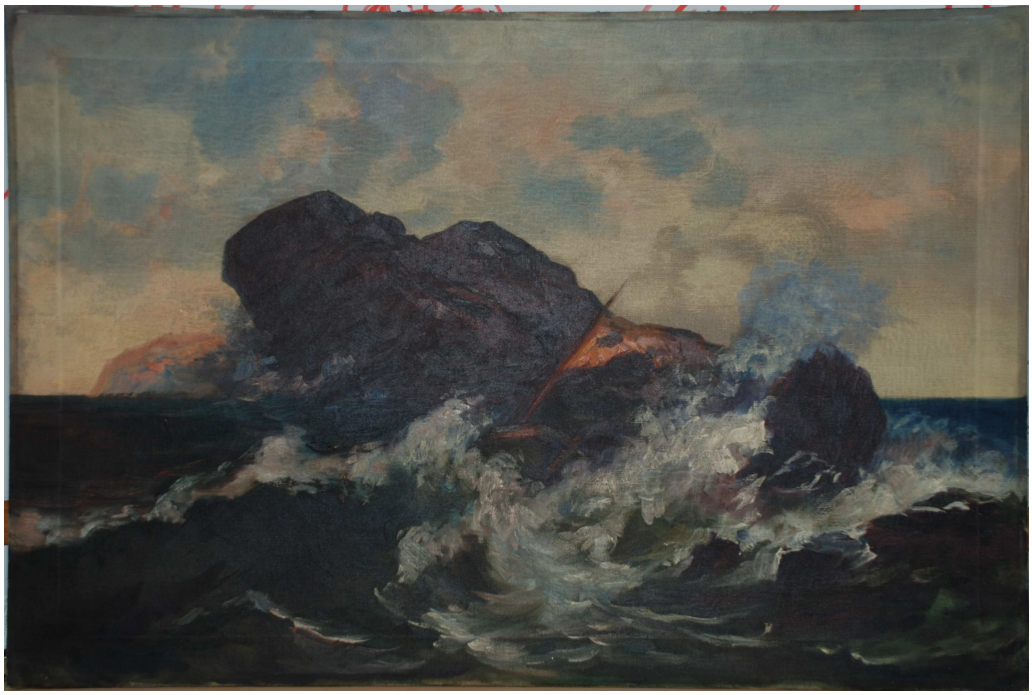

Figure 1. Photograph of Shooting Rock painting.

Figure 2. Photograph of reverse of Shooting Rock painting.

Figure 3. Photograph of detail on Shooting Rock painting.

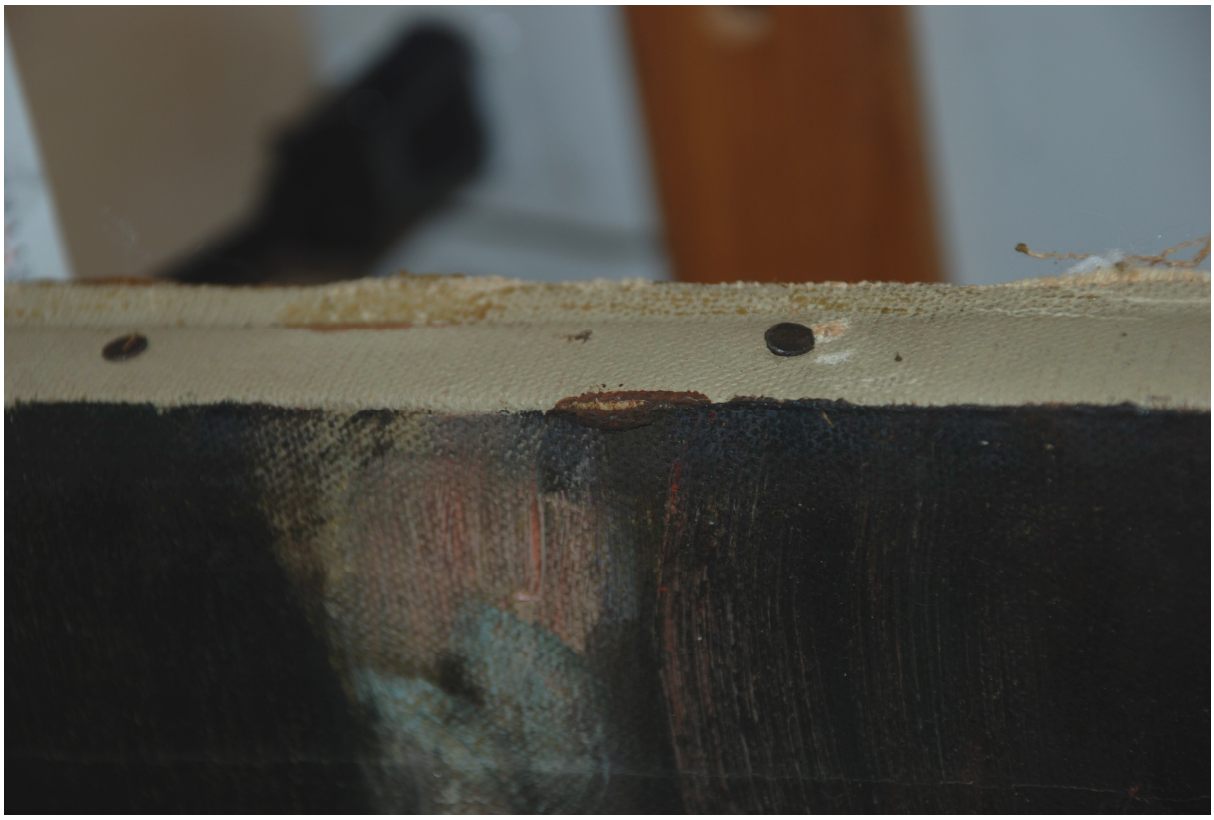

Figure 4. Photograph of edge of Shooting Rock painting.

Table I. results of analysis of paint and pigments.

Sample	Position (inches from lower left corner by inches from bottom edge)	Pigments and Medium
1	**3 x 21**	Lead white, barium sulfate, drying oil
2	**1 x 12**	Vermilion, lead white, drying oil
3	**0 x 7**	Viridian green, vermilion, manganese brown, calcium carbonate, drying oil
4	**26 x 9**	Lead white, calcium carbonate, drying oil
5	**29 x 0**	Viridian, calcium carbonate, drying oil
6	**36 x10**	Smalt blue, cadmium yellow, minor amount of ultramarine blue, drying oil
7	**34 ½ x5**	Iron oxide, red lake, drying oil
8	**5 x 11**	Cadmium orange, lead white, drying oil
9	**5 x 11**	Smalt, drying oil
10	**36 x 8**	Lead white, calcium carbonate, drying oil
11	**3 x 21**	starch grains on surface of paint layer