

OBSERVATIONS ON THE DRAWINGS OF WINSLOW HOMER

Recently I undertook a study of the drawings by Winslow Homer in the Museum of Fine Arts and in other collections and learned several interesting things about the types of paper and media he used. This experience also reminded me that one of the most difficult tasks for a paper conservator when examining a particular picture is to determine the original color of the paper.

In carrying out this study, the most important elements in arriving at a conclusion about the paper color were the following:

1. Esthetic considerations. Does the drawing make sense visually? That is, does the brightness or darkness of the paper relate well to the range of values required by the drawing media? The paper used for a number of Homer's drawings in pencil and Chinese white had darkened so much that the washes of white watercolor seemed much too brilliant and no longer worked visually. Also, the pencil lines of the drawings could hardly be read against the extremely dark brown color of the paper.
2. Close examination of the paper. Abraded areas or tears sometimes reveal color which is different from that on the surface and may be an indication of the original color. Of course, inspection of the back of the drawing and edges previously covered by a mat can provide further information, but discoloration caused by contact with poor quality matting and framing materials may be misleading and make it difficult to estimate the original color.
3. Comparison with similar works. Although it is always possible that an artist used a particular type of paper only once, usually one can find other examples for comparison. In studying Homer's works in the Museum of Fine Arts, it was particularly useful to be able to examine similar drawings in the Cooper-Hewitt Museum.
4. Interaction of media and paper. Sometimes it appears that the original color of the paper is somehow protected by chemical interaction with certain media (particularly watercolors or chalks containing white pigments), or because the paper may be shielded by an opaque medium against exposure to light. Careful examination of the paper near the edges of individual strokes of the drawing, or inspection of areas where the loss of a flake of pigment reveals the paper, may provide surprising clues about the original paper color. (Note, however, that a light brown "halo" of discoloration was often found near the edges of strokes of Chinese white applied to white papers, whereas the paper color in areas where flakes of this white paint had been lost appeared perfectly normal, without any brown discoloration. The reason for the formation of the brownish "halo" is not known, but may relate to the photochemical activity of zinc white.)
5. Analysis of paper fibers and paper colorants. Identification of fibers using light microscopy and "C"-stain, and x-ray fluorescence analysis to detect inorganic colorants in the paper yielded valuable information.

Two groups of papers were particularly interesting to compare: (1) those which have now discolored to brown but were originally colored in hues varying between gray-blue and gray-green, and (2) those which have always been more or less brown, even in Homer's day. Among the latter category is the paper used for Mussell Gatherers (fig. 1), a drawing from the period around 1881-82 when Homer was in England. This dark brown, moderately thick, rough textured, wove

paper is made from unbleached linen fibers, and contains many small black particulate impurities, which were identified as charcoal and anthracite coal. This paper was no doubt intended to be a cheap, utilitarian grade, although probably too thick to be used as wrapping paper. The drawing was executed in white chalk (sometimes brushed over with dilute washes of Chinese white), opaque white watercolor (Chinese white), and - this was a surprise - black "paint" made from powdered charcoal and applied as a watercolor. Considered esthetically the paper works effectively as a moderately dark-valued background for even the thinnest passages of white wash or chalk. The paper is quite uniform in color throughout, back and front, as well as in the areas to which white chalk and washes were applied. It is also probable the drawing has only rarely been exhibited. Therefore, in spite of its dark brown color the paper was judged to be in good condition.

Homer drew Cavalry Soldier on Horseback (fig. 2) while working as an artist-correspondent for Harper's Weekly during the Civil War. It is on moderately brown wove paper of medium thickness, probably machine made, and, when examined with transmitted light, is seen to have a fairly cloudy formation. It is much less rough textured than the paper described above but is not especially smooth, and it contains a number of very small lumps of solid impurities. The drawing reads fairly well esthetically; the brown color of the paper provides an effective foil for the black and white chalks. Close examination, however, revealed that that paper is slightly lighter immediately next to the strokes of white chalk, as well as in an area where a small portion of the chalk seems to be lost. Also, white spots appear at several places, often occurring in conjunction with the location of the lumps of impurities, so I began to wonder whether the paper originally might have been somewhat lighter than it appears now. Analysis showed that the paper is made from jute, an important raw material for papermaking in the mid-nineteenth century, although probably used mostly for cheap grades. Jute is a highly lignified fiber and is therefore likely to be darkened by exposure to light. A drawing of a similar subject on identical paper was seen in the Cooper-Hewitt collection, and though its paper was also brownish, it was unquestionably lighter and less reddish-brown than the MFA drawing. Although the Cooper-Hewitt drawing also had a few white spots that correlated with impurities, there was considerably less contrast between these spots and the paper than is the case with the MFA drawing. The history of the two drawings is such that the one in the MFA has probably been displayed far more than the other, and considering that the paper is probably inherently somewhat sensitive to exposure to light, it seems reasonable to conclude that the MFA drawing is darker than its original brown.

Incidentally, the white spots on the MFA drawing were analysed with x-ray fluorescence spectroscopy and were found to contain calcium. The white chalk was also analysed and, much to our surprise, was found to contain zinc rather than calcium. I haven't heard of any other instance of the use of a zinc compound as a chalk, but would be very interested to learn if anyone else has.

The second group of papers to be discussed includes those which were originally colored various shades of gray-blue to gray-green, but sometimes have become so badly discolored that it is hard to believe that they were ever any color other than brown. During the 1870's and 1880's, Homer often used these types of papers for drawings of subjects such as shepherdesses in bucolic settings and harbor or boating scenes, and occasionally for other subjects. He seems to have preferred such papers when working with pencil and Chinese white. When seen in good condition, the effect of these drawings is



Fig. 1

Winslow Homer, Mussell Gatherers, white chalk, Chinese white, and powdered charcoal on brown wove paper. Gift of the estate of Mrs. Sarah Wyman Whitman, through Mrs. Henry Parkman.



Fig. 2

Winslow Homer, Cavalry Soldier on Horseback, black and white chalks on brown wove paper. Courtesy Museum of Fine Arts, Boston. Anonymous gift. BPGA

wonderful! Homer's firm, assured pencil strokes, and the deft, fluid accents of white watercolor, in combination with the cool gray-blue or gray-green of the paper, produce a lively image with an amazing economy of means. It is tempting to think that the freedom and ease of execution one associates with his later watercolors is first evident in drawings such as these.

An example of this category of papers was used for The Card Game (fig. 3), dated 1878. The subject is unusual for Homer, who records here four of his acquaintances passing the time with a friendly game of cards. The overall color of the paper is a slightly brownish gray-green or gray-blue. There are a few small breaks or tears near the edges, and it can be seen that the color is clearer and less brown within the paper than it is on the surface. A photograph (fig. 4) in our files, however, shows a dramatically different condition of the picture prior to treatment in the 1950's. (Unfortunately, details of the treatment are unavailable.) Photographs of other drawings, privately owned, showed equally dramatic darkening of the paper, so that the image was scarcely discernable. I obtained permission to study the photo archives of a Boston art dealer whose firm has, over the course of many decades, sold many works by Homer, and I found still other examples of drawings of this sort that had darkened to a considerable degree. Quite naturally I began to wonder whether it was characteristic of these papers to darken more easily than other sorts of papers, and if so, why.

Of the many reasons why these papers might darken, I considered the following as the most likely: (1) poor quality matting and framing materials, (2) poor quality paper fibers, (3) chemical reactions related to the colorant used in the paper, and (4) deterioration of the sizing. It seemed unlikely that improper matting and framing could explain such extreme discoloration, otherwise one might expect that similar examples would be found equally among Homer drawings on all types of papers, whereas my limited survey suggested that the darkening occurred principally with the gray-green or gray-blue types. Moreover, although stains from mats can be quite pronounced, they are generally more intense at the perimeter than at the center, unlike the uniform, overall dark brown color seen with these drawings. Consequently it seemed likely that the source of the discoloration was one or more of the components of the paper itself.

Returning to The Card Game, I examined the paper much more carefully in an attempt to characterize it in whatever way possible and to learn as much as possible about its composition. It is of medium thickness, wove, and its color is quite uniform, suggesting that the colorant was added in the pulp stage. (Sometimes, blue papers derive their color from the presence of many individual blue fibers, but this paper is not of that type.) The surface texture of the sheet is generally fairly smooth, but it has a very subtle pattern which I began to feel is one of its most identifiable characteristics, although so faint that it would be virtually impossible to make a photograph of it that would be legible in reproduction. This pattern consists essentially of an array of very fine parallel lines, analogous to ordinary laid lines but less distinct. Also, they vary with regard to how distinct they are; they "come and go" as one scans across the surface. Although less pronounced in general than the pattern in laid paper, there is nevertheless enough texture that it sometimes produces minute variations in the pencil lines of the image. When seen in transmitted light, this surface pattern is not visible at all. In two instances portions of a watermark, probably MONTGOLFIER, were found on these types of paper, indicating French manufacture. In the only instance in which I was actually able to examine the

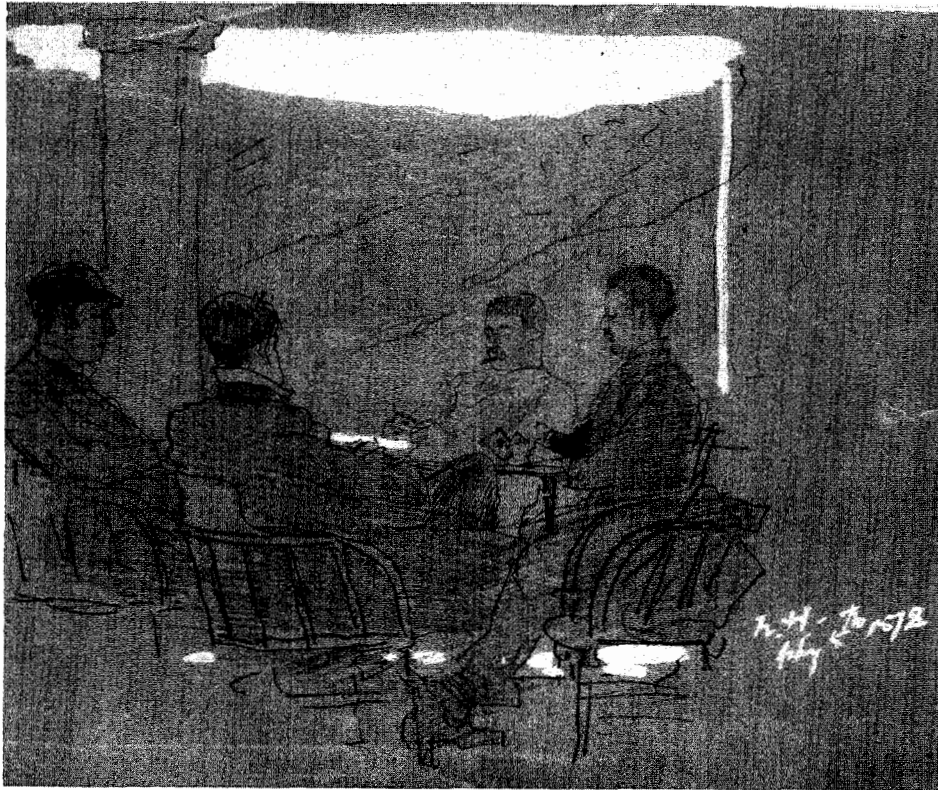


Fig. 3

Winslow Homer, The Card Game, pencil and Chinese white on gray-blue wove paper. Helen and Alice Coburn Fund.

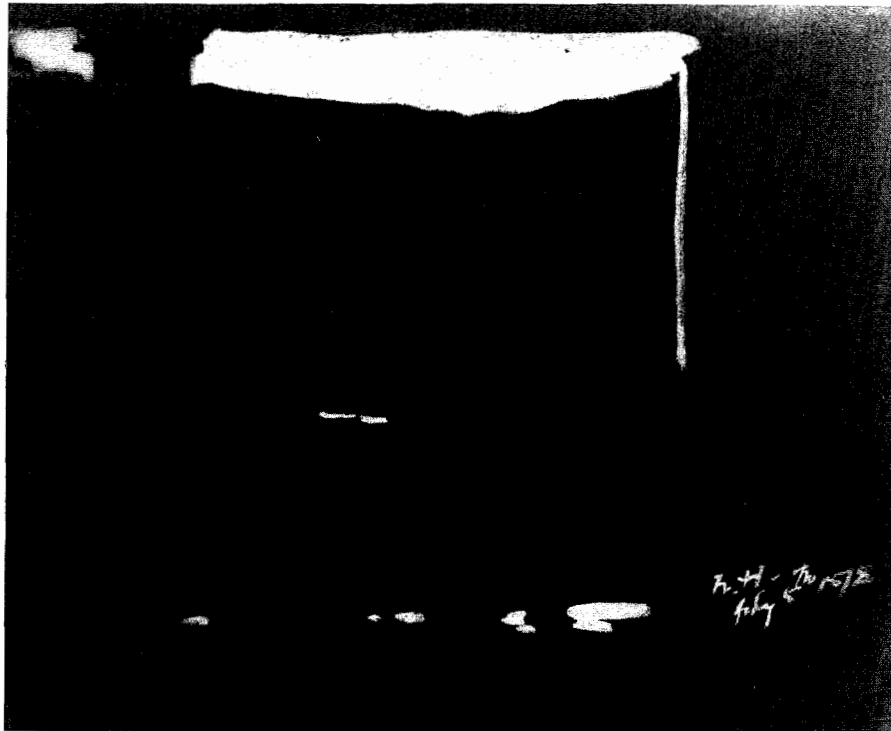


Fig. 4

The Card Game. File photograph showing condition of drawing in the BPGA 1950's.

watermark, it appeared to have been made by a dandy roll. On the whole, therefore, the paper appeared to have been made by machine, rather than by hand.

A few fibers from the paper were stained with "C" stain and examined microscopically. They were identified as entirely rag, although it was difficult to be sure whether they were cotton or linen because they were extremely short, probably as a result of considerable processing in a Hollander beater. The lack of any woodpulp or any other lignified fibers indicated that poor quality fibers were not likely to be the cause of the tendency toward discoloration.

While studying the Homer drawing, it occurred to me that it might be interesting to see whether similar papers might have been used for other works from the 1870's and '80's. I delved into the Museum's Karolik collection of American drawings and found several examples, particularly in the work of Emmanuel Leutze, John Kensett, Frederick Church, and William Trost Richards. These papers were very similar in weight and texture to that of The Card Game. They varied in color from gray-blue to gray-green, and though none had developed severe discoloration, it was very likely that none had been exposed to light for long periods, and a few showed at least a modest amount of yellow-brown discoloration.

At this point I was struck with the fact that it was quite difficult to describe the color of these papers precisely. When seen individually the papers seemed somewhat alike, although varying in intensity (saturation) of color. When arranged side by side, however, a "spectrum" of color variations became clear, ranging from a fairly pure, light gray-blue, through gray blue-green, to gray-green. It was interesting that the effect of any brownish or yellowish discoloration was to make it hard to judge whether the paper was originally gray-blue and had shifted toward gray-green by optical addition of the yellow/brown discoloration, or whether the paper was originally closer to gray-green.

To learn more about the coloring matter in these papers, and to try to find out whether they might contribute to a tendency toward discoloration, they were analysed by means of x-ray fluorescence. The results indicated that the paper contained Prussian blue, either alone or in combination with chrome yellow (lead chromate). The particular color of each sheet seemed to correlate well with the relative proportion of these two pigments. That is, if the paper contained no chrome yellow, it tended to be fairly bluish. On the other hand, if chrome yellow were present the paper tended toward greenish hues. With regard to the intermediate blue-green hues, however, because of the optical blending effect mentioned above it can be difficult to distinguish visually between a slightly discolored gray-blue sheet and one that contains both Prussian blue and a small amount of chrome yellow. In general, therefore, analysis to determine the presence of chrome yellow might be required if one wants to confirm whether the original color of a somewhat greenish paper was actually green, or whether it only looks green as a result of discoloration. The Card Game contained no chrome yellow, so it was judged to have been gray-blue originally, even though it presently looks slightly greenish. While it has not yet been possible to carry out any further analytical work, visual examination of comparable Homer drawings from this period leads me to believe that at least some of them might contain chrome yellow as well as Prussian blue.

Is it possible that the presence of either of these pigments might be responsible for development of very brown discoloration? Prussian blue is generally a fairly stable pigment and is regarded as a reliable color in both watercolor and oil. Moreover, from other informal studies I had done on blue papers, it was known that it has been used as a colorant in paper from about the mid-1770's, and I am not aware of any instances among such papers of severe discoloration of the sort encountered with Homer's drawings. Prussian blue can be decolorized by alkalis, but nothing indicated that this could be a factor in the discoloration encountered in the Homer drawings. Chrome yellow is known to change color somewhat, particularly when used as an exterior paint and exposed to the elements, but it tends to shift toward a duller yellow or greener hue, rather than turning brown. Consequently, it seemed that these pigments were unlikely to be the cause of severe discoloration.

Finally one is left, almost by default, with the possibility that deterioration of the sizing is the culprit. Considering that the paper in question appears to be machine made, it seems reasonable to suspect that darkening of alum-rosin sizing is the key to understanding the discoloration. Even without being mixed with other materials, rosin is known to darken easily upon exposure to light, so it is possible that its presence might, by itself, account for a substantial proportion of the discoloration. From the scant information about the exhibition history of the Homer drawings that showed such dramatic discoloration it seems that prolonged exposure to light was an important factor.

On the other hand, it is well known that hydrolysis of alum is one of the principle reasons why internally sized papers deteriorate more rapidly than surface sized papers made from comparable fiber stock. Perhaps for these colored papers, since alum is an effective mordant or means of attaching color to fibers, the papermaker might have decided that an additional quantity of alum would be necessary to promote retention of the colorants during formation of the paper. At this point, one's need for more answers comes up against the lack of adequate analytic means of obtaining further information - not an uncommon situation in paper conservation. Discussions with the scientists at the Institute of Paper Chemistry leave open the possibility that micro-analytical techniques for detection of rosin might be useful, but lack of sufficient comparative material or known references raise doubts about whether additional studies would be fruitful.

In summary, I would offer the following conclusions:

- 1) Homer employed colored papers for many of his drawings. Some of these papers were originally brown, although their appearance might lead one to suppose that their color is the result of considerable darkening.

- 2) There is another category of colored papers, originally gray-blue to gray-green, used not only by Homer but also by other nineteenth century artists, such as Leutze, Kensett, Church, and Richards, which may have darkened to a degree that the image no longer makes esthetic sense. The darkening seems to be the result of prolonged exposure to light, which causes the sizing to become quite brown. In some cases the darkening may be so severe that the original color of the sheet is obscured, but careful examination of any tears, abrasions, creases, the back of the sheet, or areas beneath losses of pigment may give clues about its original color.

3) The gray-blue or gray-green papers mentioned above are likely to contain Prussian blue, possibly mixed with chrome yellow, so any treatment contemplated should take into account the possible effects on these pigments.

4) Since it seems likely that the cause of the darkening of these colored papers is related to the deterioration of the sizing, if the conservator contemplates the treatment of such papers for the purpose of reducing the darkening, the question to be answered is what is the best means, if anything, to reduce the darkening of alum-rosin sizing. At this point, however, without knowing more about how discoloration develops in alum-rosin sizing, and how effective existing bleaching methods are as a means of preventing recurrence of the discoloration, it is hard to know whether such treatments will result in anything more than short-term cosmetic improvements. In this regard, I would be very interested to know whether anyone has had an opportunity to monitor the results of treatments of these papers over a period of several years, or knows of any instances in which color reversion occurred.

5) I now regard machine made gray-blue and gray-green papers from the latter half of the nineteenth century as being more vulnerable to exposure to light than hand made papers of the same period, and will take this into account when considering the frequency with which drawings on these papers can be displayed.

* * * * *

I would like to thank Konstanze Bachmann and Elaine Dee for their assistance during my visit to the Cooper-Hewitt Museum.

Roy Perkinson
Conservator of Prints and Drawings
Museum of Fine Arts
Boston, MA 02115

To the Gentlemen Tanners in this and every other town
in the Province.

I have observed that the public have been earnestly and repeatedly importuned to save rags, in order to promote the paper manufactory now carried on in this province. But I don't remember of seeing anything of this nature published by way of address to the tanners, who are able to contribute no inconsiderable part towards carrying on this essential branch of business: for it is well known that paper without sizing is but rags still; and it would be needless to inform you that this size is made of calves pates; and it is not without regret I inform you, that it is the general complaint of those gentlemen who carry on that branch of business, of the negligence of the tanners, in not saving the pates, as usual; for which reason, they have been greatly obstructed and hindered in their business. And now, Gentlemen, I entreat you in behalf of the public, to see that the pates are properly limed and dryed, and disposed of (when applied for) for the purpose abovementioned; and in so doing you will not only merit the esteem of every well-wisher to the cause of the country: but it is to be hoped, you will shortly feel the salutary effects which must necessarily arise from a plenty of paper, without any export of money.

N.B. The market-men are much addicted to leaving the skin of the calf on the head, because it looks something nicer, and will fetch perhaps the value of one shilling old tenor more; by which means there is perhaps four times that sum sunk in the community: Therefore it is presumed that no friend to the cause will buy a calve's head with the skin on; and if any should be offered to sale, it is desired that it might not only be refused but the reason assigned: And if the seller has the good of the community at heart, he will not only refrain from it himself, but will advise others to desist likewise.

Signed: (A well-wisher & promoter of American manufacture)

From: Boston Gazette and Country Journal, Monday, March 11, 1771