

Peel, Crack, and Flake: Conservation History of the Buffalo Mural

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For almost a century, the breakfast room mural, or *Buffalo Mural*, has been a preservation nightmare. The painting's survival has been challenged by flawed materials, fluctuating environmental conditions, roof leaks, burst pipes, mechanical damage, and microclimates. Since the early 1970s, conservators have sought to address these challenges but the cumulative effect of these treatments has significantly altered the character of Chanler's work without solving the problem.

The *Buffalo Mural* was commissioned for Coe Hall, the "country house" of Mai and William Robertson Coe, designed in the Tudor revival style by Walker & Gillette, and the centerpiece of Planting Fields, the Coe estate in Oyster Bay on Long Island. Chanler also painted an exotic landscape on a silver-and-blue background in Mrs. Coe's bedroom. The original mural no longer exists, although it was recreated from historic photographs in 2010. William Coe died in 1958, bequeathing Planting Fields to the State University of New York (SUNY). SUNY's occupation lasted until 1970 when the New York State Office of Parks, Recreation and Historic Preservation took ownership. Coe Hall was opened to the public as an historic house museum in 1978.

The Tudor revival style of the exterior carries through into the breakfast room, with tall arched windows and doors, a high vaulted ceiling, and limestone trim. The north and east elevations featured large open expanses of plaster for the mural, while the south and west elevations were

limited by the windows and doors. The vaulted ceiling also provided a smooth plaster surface for decoration.

Technique and Materials

The mural covers all four walls and the ceiling of the room—Chanler even extended the piece into the barrel-vaulted entryways. On the east wall, bison and elk graze and rest quietly at a water source, in contrast to wild and chaotic hunt scenes on the north and south walls. In the hunt scenes Native Americans on horseback armed with spears, bows, and arrows pursue fleeing animals. The scenes are set against an arid landscape patched with sage. At the horizon, reddish-buff colored buttes meet a cool blue sky. On the ceiling, buzzards circle overhead, and on the east wall golden eagles nest between the windows. Chanler called out the figures, animals, and some of the plants in sculptural relief. Many of these high-relief figures were gilded and toned with thin glazes of paint to produce a golden glow of reflected light. When illuminated, these highlights of toned gold glitter and shine across the mural.

Photographs from the 1920s depict a mural that captured an expansive arid and dusty Western landscape. Chanler created an unusual perspective by elevating the landscape and horizon above that of the breakfast room. The scene appeared to recede into the distance in a series of narrow horizontal planes of colors and form. A clear, bright blue sky sprang from the groin vaults at the corners of the room and from the horizon. Chanler's colors were

originally cool and clear, and his relief figures crisp. He achieved a brilliance of color and light by applying transparent glazes over the white gesso ground. The feeling of light and space was further enhanced by Chanler's use of relief and gilding. The effect was a bright, fanciful mural.

Today, the mural is dark and indistinct. Much of Chanler's detail has been crudely overworked with gesso and overpaint. Over the decades, the tonal quality of the mural has altered. The clear blue sky is now a characterless, neutral haze. The rest of Chanler's palette has muddled to a dark yellowish brown from extensive overpaints and discolored surface coatings. The overpaints appear as flat opaque fields of color lacking depth and definition.

While little documentation exists regarding Chanler's methods and materials, the *Buffalo Mural* has been the subject of ongoing study. Cross sections were used to examine the stratigraphy of the mural. It appears that Chanler first applied washes of paint over the base layer of gesso to lay out his scene. This is indicated by the very thin layers of paint that can be found between gesso layers.

The figures in the mural, man and beast, were built up with gesso. The gesso was covered with a traditional layer of red bole and then gilded with gold leaf. The gilded surfaces were then coated with thin layers of tinted glazes and scumbles. Chanler used the glazes and gold to emphasize the three-dimensionality of the figures. Under optimum lighting conditions, the mural reflects a warm glow with sparkling golden highlights. Landscape features, such as the buttes, tree stumps, and plants, were texturized with layers of gesso but left ungilded.

Deterioration

Almost from the moment it was painted, the fanciful depiction of the Wyoming landscape began to fall apart. In 1924, only four years after the mural was completed, William Coe complained in a letter, "if it is going to peel off continuously and be a continued source of expense, I would rather have it all taken off now."¹ Chanler traveled to Coe Hall to conduct repairs. It is unclear exactly what work he performed, but it appears he may have selectively repaired and repainted areas. The inherent vice in Chanler's mural construction appears to be the gesso layer. This theory is reinforced by the fact the Chanler also had to repair the mural in Mrs. Coe's bedroom.

The breakfast room has not provided an ideal environment for the mural for a host of reasons, among them moisture infiltration, roof leaks, leaky pipes, poor insulation, rapid swings in temperature and humidity, inade-

quate heating systems, and mechanical failures. Damage was also sustained during the SUNY years when the room was repurposed as a study/library with bookshelves placed against the mural.

In part, these conditions are due to the room itself, which is similar to a sunroom, with exposed southern and western elevations and large arched doors and windows that provide little insulation and admit a great deal of sunlight. The porous limestone facade has allowed moisture to infiltrate into the airspace between the exterior and interior walls and then to be drawn through the interior wall toward the mural.

The space has had at least four heating systems, two of which were particularly destructive to the mural. The original forced-hot-air system caused excessive drying of the gesso and paint and encouraged exterior moisture to migrate through the walls. In summer, the room was hot and humid. Shelving and bookcases installed against the mural face on the north and east walls caused extensive damage not only from abrasion but also from the microclimates that were created when hot air, circulating from the heat grilles at the baseboard level, became trapped behind the bookcases, drying out the paint and gesso. After the original system was replaced with a steam radiator system, water damage was sustained when a valve apparently leaked steam against the mural.

Ongoing mechanical damage has been a consequence of occupying the space year round: the mural is extremely vulnerable at the narrow barrel-vaulted entranceways on the north elevation due to abrasion from people brushing against it. Furniture placement against the mural has also resulted in paint loss.

Evaluation and Conservation

Since 1971, when NYS Parks became the steward of Planting Fields, there has been significant conservation work on the mural. In the early 1970s conservators from the Bureau of Historic Sites found the mural to be in extremely poor condition due to deterioration and poor quality repairs. Either the Coe family or SUNY had undertaken cosmetic repairs, including applying new gesso work and overpainting areas. Parks staff sought outside help to determine the causes of the ongoing deterioration, formulate a plan for stabilization, and make aesthetic repairs.

In 1973 paintings and mural conservator Gustav Berger was contracted to examine the mural.² Berger determined that a primary cause for the deterioration was the impact on the gesso layer of the rapid swings in temperature and

relative humidity. His treatment proposal identified the source of the failure as "embrittlement of the glue medium by heat and dryness caused by low relative humidity when the room is heated in the winter"³ and recommended that the environmental conditions be controlled before any conservation work. Treatment began in 1976. While records are vague, it is known that treatment consisted of consolidating the paint layer with "acrylic resins."⁴ Berger then cleaned the surface of the mural, filled and retouched areas of paint loss, and applied a surface coating.

The mural was intact for only a few months before devastating damage from failure of a cast-iron steam heater in the ductwork leading to that vent, which displaced steam into the wall cavity off the breakfast room.⁵ Subsequent condensation resulted in damage to the ceiling and water stains on the ceiling and walls.⁶ Berger was called back to address the damage. In a letter dated July 20, 1976, he wrote, "Unfortunately, parts of the ceiling must be considered lost, and the whole ceiling will have to be done over completely."⁷ Berger repainted the sky and the heating system was updated.

By the early 1980s the mural had begun to peel, crack, and flake again; a series of reports in that decade noted poor conditions, including open and cracked mortar joints on the exterior walls outside the breakfast room. Water was traveling through the masonry wall, damaging the adjacent plasterwork and subsequently the mural. More masonry repairs were performed.

The mural was conserved again in 1987.⁸ Sherman Art Conservation Studio (SACS) of Glen Cove New York was contracted, and reported: "The murals are in extremely deteriorated condition as there is active flaking and paint loss throughout the room. In many areas there is efflorescence of the stucco [*sic* (gesso)] which is the main cause of flaking. The mural is covered by both a layer of re-painting, executed in Acrylic and Latex paint as well as a reddish-yellow toned synthetic varnish."⁹ SACS first undertook consolidation using both Rhoplex 234 and Liquitex Matt Medium.¹⁰ Once the paint layer was stable, the varnish and overpaint on the upper sections of the walls and lunettes were removed with acetone. In-painting was performed using Liquitex Polymer Colors and repairs to the gilding were made with bronze powder in Paraloid B-72.¹¹ It is important to note that SACS did not apply a new surface coating in order to allow the walls to "breathe" and limit future deterioration.

However, by the early 1990s new paint loss had raised concern about the mural's stability. Experts were brought

in to analyze the materials, and in 1998 Cunningham-Adams Fine Art Painting Conservation was contracted to study the environment in the room. The firm found significant swings in temperature and humidity and recommended a new climate control system, reporting that "the climate to which the paintings are exposed is in fact extremely malignant" and noted that the paintings need not be "sensitive to explain the observed damage."¹²

Environmental conditions were addressed over the next several years, including a new climate control system; custom-made, historically sensitive storm windows and doors; room-darkening curtains to further limit heat gain (designed to match the original draperies); and digital environmental monitors. By 2007 the environment was much improved.

Unfortunately, by then the mural needed treatment again. Before proceeding, NYS Parks conservators wanted to verify that the rate of loss and flaking had stabilized. The mural was divided into grids and photographed at high resolution. The Williamstown Art Conservation Center was commissioned to analyze samples of both the paint and gesso layers.¹² Fourier transform infrared spectroscopy (FTIR) found calcium carbonate, oil, and protein in samples of the gesso layers. The paint layer was determined to be too thin to be isolated from the gesso and polyvinyl acetate surface coating. FTIR analysis of this combined paint, gesso, and surface coating showed clay, calcium sulfate, and quartz, which suggest brown earth pigment. It was impossible to separate exactly which elements Chanler used in his paint layer versus those found in the other layers.

Recent Research and Treatment

While the mural's deterioration was now generally attributed to the environment, conservators did not want to make assumptions that might lead to another failed treatment. Parks conservators began testing frequently used consolidants in anticipation of treating the mural. Mock-ups of the mural were made and artificially aged. Historically, the point of failure had been gesso-plaster and gesso-gesso interfaces. The primary goal of the testing was to confirm that the consolidants could reach this interface. Treating from behind the mural was deemed impossible due to the location and wall construction.

Determining the depth of penetration of the consolidants proved difficult. Initial testing revealed that dyes often used to track depth of penetration actually inhibited the performance of the consolidant. Advanced

techniques used to detect the presence of consolidants, such as x-ray fluorescence, micro-raman, and SEM can be expensive, difficult, and inconclusive. Seeking an alternative, conservators explored advancements in nanotechnology to determine the depth of penetration.

The theory was that nanoparticles could be used as an effective tagging material to determine depth of penetration. In 2010 NYS Parks received a National Center for Preservation Training and Technology grant to research the innovative use of nanoscience to advance preservation technology. Because of their stability, intense fluorescence, and nano size, nanoparticles were thought to be an ideal tool for analyzing the effectiveness of conservation treatments. While nanoparticles exhibit a wide range of characteristics, the field was narrowed to nanoparticles that fluoresced under ultraviolet light.

By mixing nanoparticles with the consolidant and studying the work under ultraviolet light, conservators could clearly see where the adhesive had moved into the test material. The testing identified successful pairings of consolidants and nanoparticles that were compatible with the materials in Chanler's mural. After conducting preliminary tests on mock-ups, effective consolidant/nanoparticle pairings were tested on samples from the Breakfast Room mural. Examination of the samples under ultraviolet

light revealed that none of the consolidants were able to penetrate through the mural's surface layers. It was determined that the consolidants used to stabilize the mural were unable to effectively penetrate the gesso layer to reach the areas of detachment.

This was a key finding. Chanler had built up an impenetrable layer of gesso across more than 90 percent of the mural. The area of detachment behind the gesso was unreachable until failure had already begun to take place. Only then could consolidant be injected through cracks into the area of detachment. This meant that a one-time treatment solution was not possible. Failure had to be addressed on a regular basis to prevent loss. Controlling the environment was also revealed as more important than ever.

In spring 2014 NYS Parks conservators began stabilizing the mural, beginning with the south elevation. Treatment included setting paint, injecting resin to fill voids, removing efflorescence, and filling in and retouching areas of loss. Many once-conserved areas had to be re-adhered. The combined effects of deterioration and restoration work may have caused irreparable damage to Chanler's original work. Ongoing stabilizing may be the only conservation treatment available at this time.