

Conserving a Conservator's Paintings: Study and Preventive Care of Paintings by Felrath Hines

ABSTRACT

This article summarizes an investigation into the underlying causes of propagating cracks on the surface of Untitled, 1978 by artist and conservator Felrath Hines. Analysis, archival research, and a survey of other works by the artist were carried out. The study revealed that Hines consistently painted in oil over an alkyd ground and carefully documented his palette and revisions. Cracking and poor adhesion were attributed to alkyd grounds, the artist's reworking process, and the presence of zinc soaps. Preventive conservation strategies were employed for Hines's works in the National Museum of African American History and Culture's collection with the aim of forestalling further deterioration.

1. BACKGROUND

Samuel Felrath Hines, better known as Fel by his friends and colleagues, was an African American artist and paintings conservator based in New York and Washington, DC (fig. 1). Born in Indianapolis, Indiana, in 1913, Hines showed an early artistic sensibility. As a young man, he supported his study of painting and design at the School of the Art Institute of Chicago by working nights for the Chicago Northwestern Railroad as a dining car waiter. Hines moved to New York in 1946 to continue pursuing his artistic practice. By the early 1950s, he had abandoned his early cubist figurative style and began painting abstract compositions that progressed toward an arrangement of geometric forms in space reminiscent of the De Stijl movement.

During the decade-long period when he worked for the renowned framer Robert M. Kulicke in New York, Hines met conservators Caroline and Sheldon Keck and began an apprenticeship at the Brooklyn Museum in 1959 under their tutelage. Finding conservation to be a natural extension of his interests and skills, Hines went on to operate his own private paintings conservation practice in New York for many years while continuing to paint and exhibit his work. See figure 2 for an overview of selected events in the life of Hines.

Felrath Hines resisted the problematic framework of "Black art," asserting that "there is no Negro image in the twentieth century...each person paints out of the life he lives" (Siegel 2011). During the first few years of his conservation career in the early 1960s, Hines participated in weekly conversations

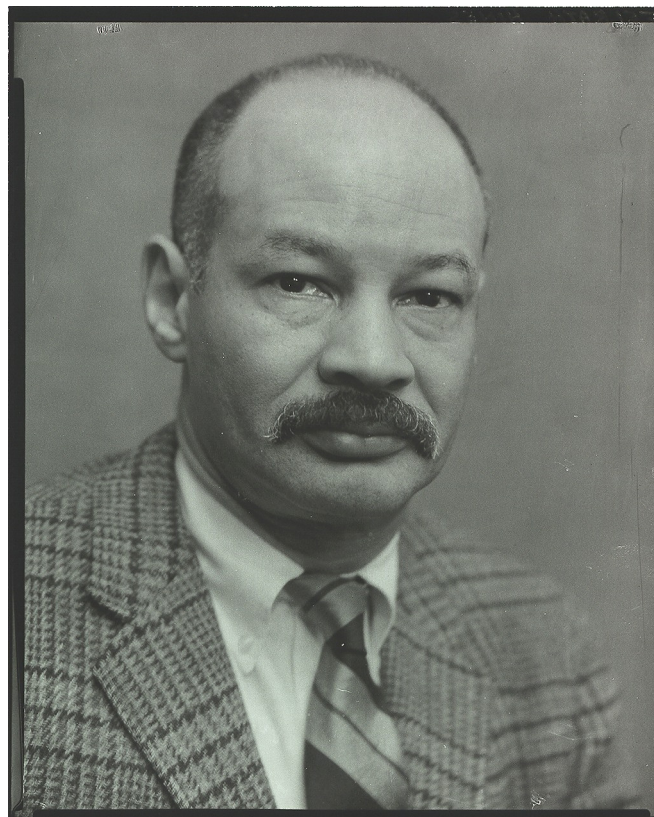


Figure 1. Felrath Hines, ca.1973 (© Peter A. Juley & Son Collection, Smithsonian American Art Museum, reproduced with permission)

with Romare Bearden, Charles Alston, Norman Lewis, Hale Woodruff, and several other African American artists in a

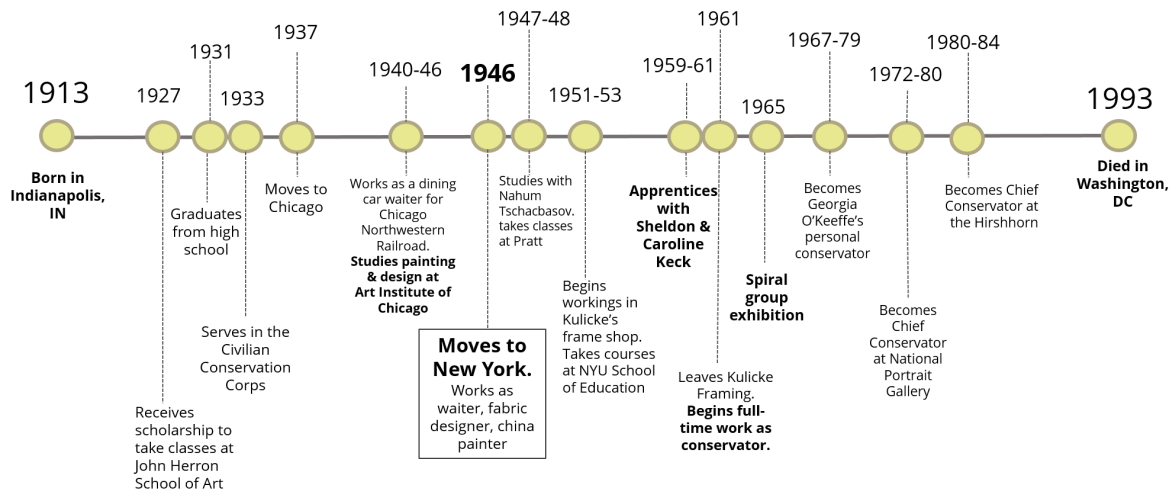


Figure 2. Timeline of selected events in Felrath Hines's life, summarized from the chronology in Perry's *The Life and Art of Felrath Hines: From Dark to Light* (2019)

collective that came to be known as Spiral. The group, which met to discuss the role of African American artists in the civil rights movement and the broader landscape of American politics and culture, mounted their only exhibition in 1965, titled "First Group Showing (Works in Black and White)." Following several years of exhibiting his work and treating modern and contemporary paintings for the Museum of Modern Art, the Whitney, and numerous New York galleries, Hines was recruited to the position of Chief Conservator at the Smithsonian National Portrait Gallery in Washington, DC, where he worked from 1972 to 1980. He later served as Chief Conservator at the Hirshhorn Museum and Sculpture Garden until his retirement in 1984, all the while continuing to paint and exhibit. For a more complete biography, refer to Rachel Perry's *The Life and Art of Felrath Hines: From Dark to Light* (Perry 2019).

2. UNTITLED, 1978

Untitled, 1978 was painted in thin, luminous passages that depict four adjacent and intersecting squares (fig. 3). The squares overlap a rectangular form layered over two gray fields. This work was executed between May 1977 and February 1978, during which time Felrath Hines would have been living in Silver Spring, Maryland, and serving as Chief Conservator at the National Portrait Gallery (Hines 1973–1991).

While on display at the Smithsonian National Museum of African American History and Culture (NMAAHC), an increasing number of fine, feather-like cracks were



Figure 3. Felrath Hines, *Untitled*, 1978, oil on linen, 134.6 × 205.7 cm (Collection of the Smithsonian National Museum of African American History and Culture, Object No. 2009.11.4)

observed (fig. 4). It became apparent that the cracks and areas of delamination on the painting were actively propagating, with the largest proliferation coinciding with humid weather outside the museum. In order to better understand the underlying causes of the deterioration, a comparative investigation into the materials and technique of three other works by Felrath Hines in the NMAAHC collection was undertaken at the Smithsonian Museum Conservation Institute (MCI). One other painting by Hines in the collection was found to exhibit similar signs of feather-like cracking. To determine whether this type of cracking was related to a particular time period or set of materials, archival records were consulted and a survey of

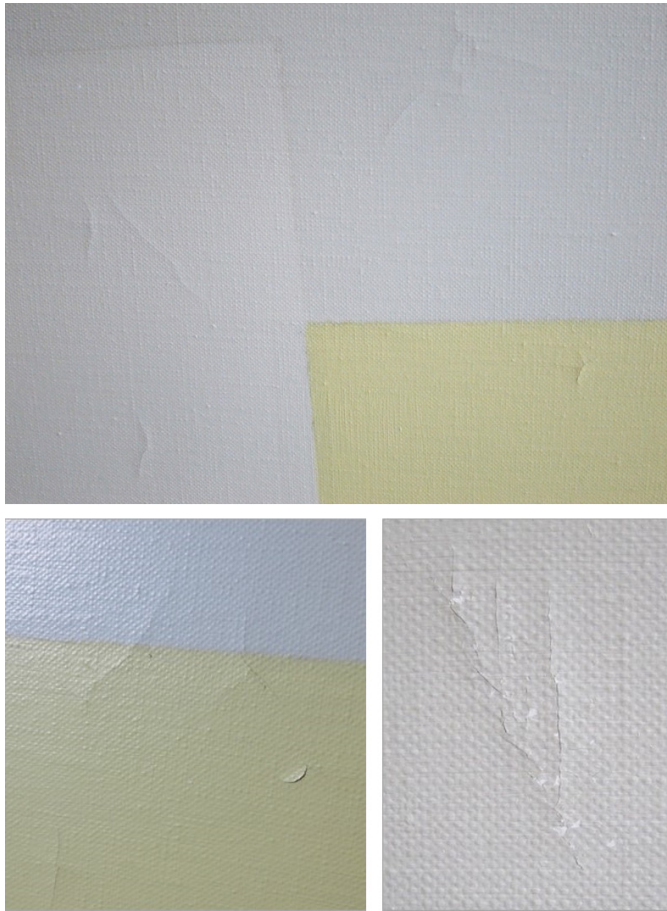


Figure 4. Details of fine, feather-like cracks, losses, and lifted paint observed on *Untitled*, 1978.

paintings from the artist's foundation and nearby collections was carried out.

3. MATERIALS AND TECHNIQUE

Over 20 paintings ranging in date from 1950 to 1992 were examined at the Felrath Hines Foundation and three neighboring Washington, DC collections: the Smithsonian American Art Museum, the Phillips Collection, and the David C. Driskell Center at the University of Maryland. Most of the works examined were in good condition, with a few notable exceptions. Two works belonging to the artist's estate, dated 1970 and 1972, exhibited significant delamination, cracking, and losses, with feather-like cracks similar in appearance and distribution to those seen in the NMAAHC's *Untitled*, 1978. Analysis by scanning electron microscopy-energy dispersive x-ray spectroscopy (SEM-EDX) of the paint layer from the Hines Foundation's 1970 work showed distributions of zinc in

the upper paint layers [1]. Additionally, zinc soaps were detected by attenuated total reflection FTIR (ATR-FTIR) [2]. Both untitled works from the Hines Foundation appeared to have been reworked by the artist.

From the works in stable condition, it was possible to learn more about the artist's methods and materials. Graphite lines beneath the paint were visible in many paintings, as were broad scumbles over bright underpaintings. Evidence of repainting was present on some edges and in losses, revealing earlier color choices below. In an interview from the early 1990s, Hines reported that he added two coats of zinc or titanium white to his commercially prepared double-primed canvases in order to "close up some of the little inconsistencies of the surface" (Coleman 1995). A similar method was noted in earlier works, such as in the Phillips Collection's *Red Painting* (1971–1973), where drips from three distinct priming layers were visible on the foldover edge.

A dialog between conservator and artist is apparent within his work, as Hines prepared his surfaces with meticulous craftsmanship and a thorough understanding of his materials, mindful of his own legacy through careful documentation. He regularly attached backing boards to the backs of his paintings and inscribed his name, the year, medium, support, and dimensions, in addition to recording specific details relating to the composition of a varnish or the desired location of D-ring hanging hardware. He often repeated portions of this information on one of the stretcher bars. In many of his works, Hines secured the keys in place on the stretcher, tacking beside the key or through the miter joinery. Hines also used a Lebron (expansion bolt) stretcher in at least one work, which he would have likely been introduced to during his time in the New York conservation scene in the early 1960s (AIC 2014).

4. STUDIO NOTES

Three volumes of Hines's studio notebooks dating from 1973 to 1991 were examined at the Felrath Hines Foundation. Entries generally included a given painting's dimensions, a start date, the dates of any revisions, and a list of pigments. The pigment list often contained directional locations or references to the composition, such as "TOP," "UL [Upper Left]," or "green square." When a composition was revised or repainted, previously chosen colors were dutifully crossed out and new ones listed. Connecting Hines's notes to his carefully labeled paintings allowed us to find entries for three out of the four paintings in the NMAAHC's collection.

From his studio notes, it became apparent that Hines's compositional revisions were carried out with some duration between painting sessions, during which time the paint was able

to partially oxidize, or “dry.” The surfaces of Hines’s later abstract works are generally smooth and level, free of noncorresponding brushstrokes and with no evidence of scraping. Brushstrokes, where visible, are broad and even, suggesting that forms were painted quickly with a sizeable brush. These observations suggest that, rather than painting continuously over the period between entries, Hines waited some period of time before revisiting a work. It is suspected that the delamination noted in *Untitled, 1978* stems in part from adhesive failure due to poor adsorption or bonding between the new and old paint layers.

5. ANALYSIS

An investigation was undertaken to characterize the materials used in the four paintings by Felrath Hines in the NMAAHC’s collection. Each work was examined and documented in normal and raking light, UV radiation, and under magnification. Cross-sections, obtained from passages of paint along the tacking margins, were analyzed with optical microscopy and SEM-EDX to better understand the painting’s layered structure and elemental composition [3]. Loose samples of paint obtained from losses or along the tacking edges were analyzed with ATR-FTIR and pyrolysis gas chromatography mass spectrometry (py-GC-MS) to characterize the organic components of the paint and ground. For the purposes of this postprint, the analysis of only one of the four works—*Untitled, 1978*—will be discussed.

A sample of gray paint from the tacking edge of *Untitled, 1978* was analyzed with ATR-FTIR. Peaks typical of an oil binder

were detected (2919, 2841 cm^{-1} , 1738 cm^{-1} , 1161 cm^{-1}), as were absorptions characteristic of crystalline zinc soaps (sharp peak at 1538 cm^{-1}) and amorphous zinc carboxylates (broad peak around 1583 cm^{-1}) (Learner 2004, Bajj et al. 2018). Zinc soaps, whose presence is often associated with cracking, paint loss, and other deterioration, can be triggered following exposure to water or high humidity (Bajj et al. 2018, Hermans et al. 2019). Strong absorptions typical of zinc oxide and titanium dioxide were also present from 400 to 900 cm^{-1} . Additionally, a small amount of lead carbonate was detected. FTIR indicated that nearly all samples from the NMAAHC’s four paintings contained zinc soaps, though only two works showed any signs of deterioration.

Analysis with SEM-EDX confirmed the presence of many of the pigments listed in Hines’s notes. In a cross-section taken from the upper right quadrant of the painting (fig. 5), mounted in partial satellite view, three layers and the ground are visible. A small amount of a tan layer was noted toward the top of the cross-section. Based on its appearance, this layer portion likely corresponds to the earlier tan layer listed as a mixture of “Naples yellow, white, burnt umber, and ferrous black” in Hines’s notes (Hines 1973–1991). From the detection of zinc, titanium, and lead, it is possible that Hines mixed lead, titanium, and zinc white paints in this color mixture. The absence of antimony and nickel suggests that the Naples yellow he was using was neither genuine Naples yellow (lead antimonate) nor a modern hue (nickel antimony titanium rutile), but rather an organic pigment. The presence of iron correlates with the reporting of small amounts of burnt umber and a ferrous black (possibly

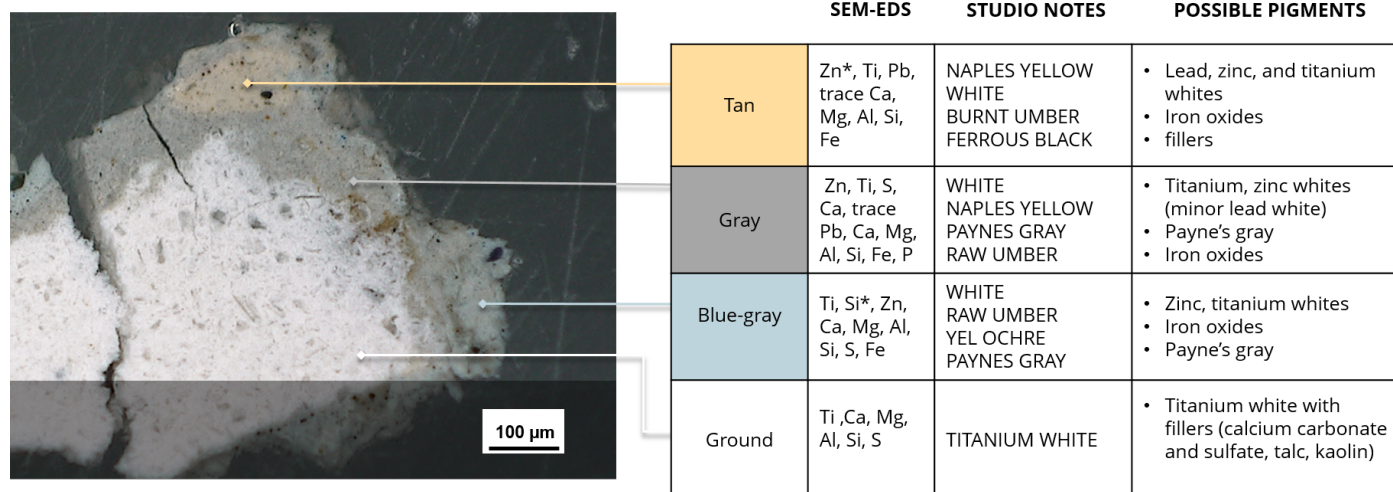


Figure 5. Left: Photomicrograph in satellite view of a cross-section obtained from *Untitled, 1978*. Right: Chart comparing observed paint layer colors; elements detected by SEM-EDX analysis; Hines’s recorded pigments used for *Untitled, 1978* from his studio notes; and possible pigment assignments for each layer based on SEM-EDX results.

Mars black). Calcium, magnesium, aluminum, and silicon are likely present as components of fillers. The gray layer and blue-gray layers both appear to contain an ultramarine-based Payne's gray (containing aluminum, silicon, sulfur), with iron-based blacks and browns and mixed whites. Minor concentrations of phosphorus in the gray layer suggest that ivory black was also used.

Samples of the ground were analyzed with ATR-FTIR and py-GC-MS. Both techniques confirmed an oil-modified alkyd binder. Additionally, titanium dioxide, kaolin, calcium carbonate, and talc were identified with FTIR and confirmed with SEM-EDX. The grounds for paintings from 1970 to 1989 all appear to contain titanium white, an alkyd binder, and numerous fillers, suggesting a commercial "oil ground," which often contains an oil-modified alkyd binder that promotes fast drying (Gamblin 2019). Oil-modified alkyds contain a polyester backbone and are of a higher molecular weight than traditional oils, allowing for rapid cross-linking and film formation (Ploeger et al. 2009).

6. PREVENTIVE CARE

Because all four works by Hines in the NMAAHC's collection were created with similar materials, preventive conservation strategies were employed with the aim of forestalling the occurrence of zinc soap-related deterioration. The storage of *Untitled*, 1973 (a painting with similar patterns of deterioration as *Untitled*, 1978) in an archival corrugated cardboard enclosure wrapped in a polyethylene membrane was found to halt the formation of new feather-like cracks, likely due to a lessening of the painting's exposure to fluctuations in relative humidity and temperature. Additional measures—such as displaying the work behind glazing with a backing containing silica gel, Art-Sorb sheets, or similar materials—may also be undertaken to ensure that the painting's environment remains stable.

7. CONCLUSIONS

Regardless of an artist's skill, knowledge, and adherence to best practices, the inherent instability of modern materials will continue to present challenges to conservators. The delamination in *Untitled*, 1978 appears to have occurred primarily between the upper zinc-containing layers. Zinc soaps have been observed to form and migrate along medium-rich layer interfaces, resulting in patterns of deterioration that include delamination (Hermans et al. 2019). The presence of alkyds in Hines's grounds may also be cause for concern, as alkyds are known to form a stiff, brittle film, making them susceptible to cracking when applied over flexible supports (Ploeger et al. 2009). The differences in

film rigidity between the alkyd ground and oil paints have been estimated to cause condition issues in other artists' works as well (Alba et al. 2010). Furthermore, the lack of an adhesive bond between paint layers, especially those that have been allowed to dry for a period of time, may promote delamination.

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NOTES

1. SEM-EDX was performed on carbon-coated embedded samples in high-vacuum mode using a Hitachi S3700-N scanning electron microscope (SEM). EDX was performed using a Bruker XFlash 6|60 detector with Esprit software version 2.1.2.17832. Samples were analyzed at a 15-kV primary electron accelerating voltage.
2. ATR-FTIR was carried out with a Thermo Nicolet 6700 FTIR spectrometer equipped with a mercury cadmium telluride type A (MTC-A) detector. Samples were analyzed with a Golden Gate ATR and MTC-A detector. The data were collected at 4 cm⁻¹ spectral resolution, using 64 scans in ATR-FTIR mode.
3. Microscopy was performed with a HIROX KH-8700 digital microscope with the MXG-2500REZ dual illumination lens and 2.11 megapixel CCD sensor. The microscope is equipped with a motorized z control, which allows for the collection of a focal stack that can be rendered into a three-dimensional image with the HIROX KH-8700 embedded proprietary operating system and software package.

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FURTHER READING

Felrath Hines papers, 1913–1993. Archives of American Art, Smithsonian Institution, Washington, DC.