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Author(s): Margo Delidow and Cynthia Albertson
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RE-THINKING THE CLEANING OF CLAES OLDENBURG'S *FLOOR CAKE (GIANT PIECE OF CAKE)*

MARGO DELIDOW AND CYNTHIA ALBERTSON

ABSTRACT

In 1962 Claes Oldenburg created a body of work for his first one-man show at the Green Gallery, New York. Oldenburg and wife Patti Mucha used a portable sewing machine, heavy weight canvas, cardboard boxes, foam, and acrylic paint to create his first giant soft sculptures in the shape of a hamburger, an ice-cream cone and a giant piece of cake. *Floor Cake (Giant Piece of Cake)* entered the collection of The Museum of Modern Art (MoMA) in 1975 and has been very heavily exhibited. The object has 15 square feet of painted cotton canvas, three square feet of which are intended to rest directly on the floor. The historical maintenance of this work, while on view, was to mechanically readjust the interior stuffing by fluffing the layers. The results of life in a busy museum environment have left *Floor Cake* with cracking and paint loss, abrasions, tears and punctures, and extensive surface soiling. With two previous treatments already on record, conservators at the Museum of Modern Art were confronted with the re-treatment of forty-seven year old, 5 x 9 ft. *Floor Cake (Giant Piece of Cake).* This paper investigates the effects of past treatment and explores the practical application of surface cleaning acrylic paint with Oldenburg's *Floor Cake* as a case study.

1. INTRODUCTION

Surface cleaning of acrylic paintings has been discussed in the art and conservation literature since the 1960s but has gained widespread interest and momentum across the scientific and conservation community in the last decade. The Modern Paints project initiated in 2002 was a collaboration between the Tate Modern, London; the National Gallery, Washington D.C.; and the Getty Conservation Institute (GCI), Los Angeles, CA. Building on this research, in 2006 The Modern Paints Uncovered Symposium brought together over 250 conservators, scientists, and artists from around the world to share among other things their understanding of acrylic paint and its treatment. As part of GCI's initiative to integrate current research into the field, a colloquium titled *Cleaning of Acrylic Painted Surfaces: Research into Practice* (CAPS) was held in the summer of 2009. This gathering facilitated a dialog on the application and evaluation of new treatments, and aimed to guide future research on acrylic painted surfaces.[1] The Modern Paints project's most recent results have been presented at the American Institute for Conservation's annual conference in 2009 (Keefe et al.) and 2010 (Phenix et al.). GCI in collaboration with Dow Chemical Corporation has used their High Throughput System (HTP) to test the cleaning ability of numerous aqueous systems with parameters like pH, conductivity, surfactant type and concentration, chelator type and concentration, and variations of these solutions. HTP utilizes swab-bearing mechanized arms to systematically clean manufactured dirt on painted mock-ups, giving scientists and conservators extensive results on potential protocols for cleaning acrylics.

Sculpture and painting conservators at Museum of Modern Art (MoMA) collaborated from the onset of this project to study all of the current available research and treatment methods. They observed that there is a lack of recent publications from conservators on cleaning treatments for acrylic paintings or painted objects. Acrylic paints are, in a word—complex. They have various compositions of acrylic binder, pigment, wetting agent, dispersing agent, thickener, freeze-thaw stabilizer, coalescent, biocide, pH buffer, and defoamers. Within the acrylic binder, among other components there is an emulsifier or a surfactant that remains in the film upon drying, which can then migrate to the surface affecting the optical clarity of the paint film. Due to their low T_g and the plasticizing effect of surfactants, acrylics become soft and flexible when above room temperature. Dust and grime can then become embedded in the surface. If the readily water soluble surfactant is removed the optical clarity is returned and the acrylic film becomes more firm, reducing the attraction of dirt to the surface (Hayes et al. 2007). There is a wealth of published information regarding the formulation and properties of acrylics, and this paper brings several together in the bibliography for the object conservators' reference. Conservators at the MoMA sought to study *Floor Cake's* previous treatments and to find a practical re-treatment including cleaning and consolidation for the acrylic painted object with the intention to share the results with both the conservation community and the general public.

Fig. 1. Claes Oldenburg *Floor Cake* 1962 before treatment in the gallery in 2009 (Photograph by Delidow)

2. OBJECT HISTORY

The Swedish born Claes Oldenburg moved to New York City in 1956 to become an active member in the artistic community. His first New York exhibition took place in late 1958 when a selection of his drawings was included in a group show at Red Grooms' City Gallery (Umland 1998, 68–69). In the winter of 1961, Oldenburg opened a "Storefront" on the Lower East Side of Manhattan that featured a wide variety of every day materials rendered in plaster covered muslin finished with glossy paints. The sculptures included undergarments and food items such as slices of blueberry pie. In 1962 in a subsequent incarnation of *The Store* at the Green Gallery, New York, Oldenburg and wife Patti Mucha used a portable sewing machine, heavy weight canvas, cardboard boxes, foam, and acrylic paint to create artworks for Oldenburg's one-man show. In operation from 1960 to 1965 the Green Gallery was located at 15 West 57th Street in New York City, presenting the work of artists such as Tom Wesselmann, James Rosenquist, and Donald Judd in addition to Oldenburg (Mucha 2002, 79-87). The Green Gallery featured *Floor Cake (Giant Piece of Cake)* (fig. 1), *Floor Cone* also in the collection at MoMA, as well as *Floor Burger* now in the collection of Art Gallery of Ontario. Similar to *The Store* but in this instance on a much larger scale, the artist filled the gallery with super sized sculptures of food and household items.

3. CONDITION

Measuring 5 feet wide by 9 feet long and 5 feet high, *Floor Cake* is constructed out of five separate "cake" layers, and two smaller forms sewn to the top (fig. 2). Each layer is sewn from heavy weight cotton canvas duck. Oldenburg and his wife used upholstery techniques including details such as fabric covered zippers to finish the openings (fig. 3). The layers were painted by alternating dark brown paint with white to represent "chocolate cake" and "icing" and then filled with foam and cardboard boxes. Attached to the top layer are two smaller sewn and stuffed forms; MoMA has referred to the long cylindrical topping as the sprinkle, while the dark ochre dollop is known as the chocolate drop.

Fig. 2. *Floor Cake* 1962 deconstructed in the conservation lab at MoMA (Photograph by Albertson)

Fig. 3. Detail of sewn covered zippers on each of the five layers of the cake (Photograph by Albertson)

Overall, this popular piece of painted cake is in remarkable shape for a forty-seven-year-old soft sculpture that has been heavily exhibited in the museum, across the United States, and around the world. As any courier knows, an object is moved multiple times during the course of exhibition travel—from packing and trucking, to palletizing and flight. In the 21st century *Floor Cake* has made its way to Paris, Bonn, Berlin, and as far away as Japan. US tours included venues in Washington DC, Richmond, Dallas, Los Angeles Chicago, Worcester, Toledo, Denver, San Diego, and Omaha. Like *Floor Cake*, *Floor Burger* has also been immensely popular and thus heavily exhibited. Colleagues at the Art Gallery of Ontario shared their concerns about the condition of *Floor Burger*, as there are many paint losses, most often along creases in the fabric support. Aside from vacuuming and dusting, *Floor Burger* has not been previously treated (Phillips, 2009) (fig. 4). *Floor Cone* in MoMA's collection was also never treated and has not been exhibited as heavily and does not show the wear and tear that *Burger* and *Cake* show (fig. 5).

Fig. 4. *Floor Burger* 1962. Installation view of the exhibition *Claes Oldenburg* at MoMA September 23–November 23, 1969. Now in the collection of the Art Gallery of Ontario, Toronto. (Photograph by James Mathews, courtesy of MoMA Archives)

Fig. 5. Floor Cone 1962 (Courtesy of MoMA)

The sculpture has a total of 15 square feet of painted cotton canvas, three of which are intended to rest on the floor. *Floor Cake's* life in a busy museum environment has resulted in extensive surface soiling, cracking and paint loss (figs. 7, 8). The thinner or single applications of paint are in good condition, although there is notable paint loss to the upper-most layer where the most handling and manipulation occurs. The thicker or multiple layered areas of paint are cracked throughout. The maintenance history of this work has indicated that the interior stuffing was adjusted by "fluffing" the layers. Undoubtedly this has contributed to some of the mechanical failure seen in the paint layers. There are also minor abrasions and small tears and punctures. Upon visual inspection the chocolate drop appears to be an oil based paint exhibiting chalky white efflorescence.

Fig. 6. Detail of surface soiling along the edge of the bottom layer of *Floor Cake* (Photograph by Delidow)

Fig. 7. Detail of cracking seen in the more thickly painted layers (Photograph by Delidow)

Fig. 8. Detail of paint loss seen on upper most layer of *Floor Cake* (Photograph by Albertson)

The *Cake's* stuffing is degrading as evidenced by overall compressed and sagging layers. Comprised of polyurethane foam and cardboard boxes, it was amusing to learn that the cardboard boxes are, rather whimsically, three different sizes of ice cream containers (fig. 9). When asked about his choice of filling materials, Oldenburg commented that an ice cream shop was close to his studio and it was what he had available to him at the (Oldenburg, 1998). While the foam is discolored and brittle in some instances, most of it remains soft and flexible. Without preventative measures, the foam most likely will eventually disintegrate leaving nothing to fill the *Cake*.

Fig. 9. Ice cream container and foam from interior of *Floor Cake* (Photograph by Delidow)

An archival image of *Cake* in 1975 depicts the drop and the sprinkle in a different location from what was seen during the condition examination (fig. 10). As a likely explanation for this alteration, MoMA's oral history and object files revealed that in *Cake's* early days of its travel. The crate was not large enough to house the cake completely assembled. Therefore the toppings had to be detached for transit. Through the course of our examination original tether locations for the drop and the sprinkle were located and the toppings moved back to their 1975 location (figs. 11, 12).

Fig. 10. *Floor Cake* upon acquisition in 1975 (Photograph by Keller, MoMA 1975)

Fig. 11. Floor Cake upper layer detail of tether location (Photograph by Delidow)

Fig. 12. *Floor Cake* before treatment image overlaid with 1975 acquisition image (see figure 10)

4. ANALYSIS

It was suspected that Oldenburg was using acrylic paint for the *Cake* layers as well as an oil-based paint he may have had left over from *The Store*. Analysis with FTIR confirmed that Oldenburg used at least two different types of paint for *Cake*: a paint with a polyvinyl acetate binder for the icing on the upper cake layer, as well as an alkyd paint with an oil component for the chocolate drop. The chocolate drop is painted with a thick layer of high gloss ocher paint, not observed elsewhere on the sculpture. Additionally, a chalky white bloom has developed on the surface of the drop. This same bloom has been observed with similar paints that Oldenburg used with his painted plaster objects from the Store (Ordonez, Twilley 1998). The spectra, revealing an oil based paint, explained the white bloom or efflorescence seen on the drop as oil paints contain free fatty acid deposits that can migrate to the surface of works (Schilling, Khanjian, Carson 1997, 71–78).

Paint samples were taken from the light and dark *Cake* layers as well as the chocolate drop and sprinkle (fig. 13). The polished cross sections were quite surprising. Within all of the samples there is evidence of a white ground preparation layer. The object went through many iterations best illustrated by the "chocolate drop" as what appears to possibly be flavors of cherry, lime, and orange before the upper most layer of dark ocher brown. The sections reveal an extremely painterly quality to Oldenburg's application of layers. Curatorial records from both the Art Gallery of Ontario and MoMA indicate that Oldenburg stated that he painted *Floor Burger* and *Floor Cake* with latex and liquitex.[2] Liquitex is a brand name for an artist grade paint made from an aqueous acrylic emulsion (Rhoplex AC-33 in 1962), while latex is a common generic name used for house paints during the 1960s. By 1962 latex would have an acrylic, styrene butadiene, or polyvinyl acetate binder. FTIR results from the samples taken were consistent with the presence of a latex paint on the cake layers, as well as an alkyd paint with an oil component on the chocolate drop. Additional sampling and testing may have revealed another type of binder.

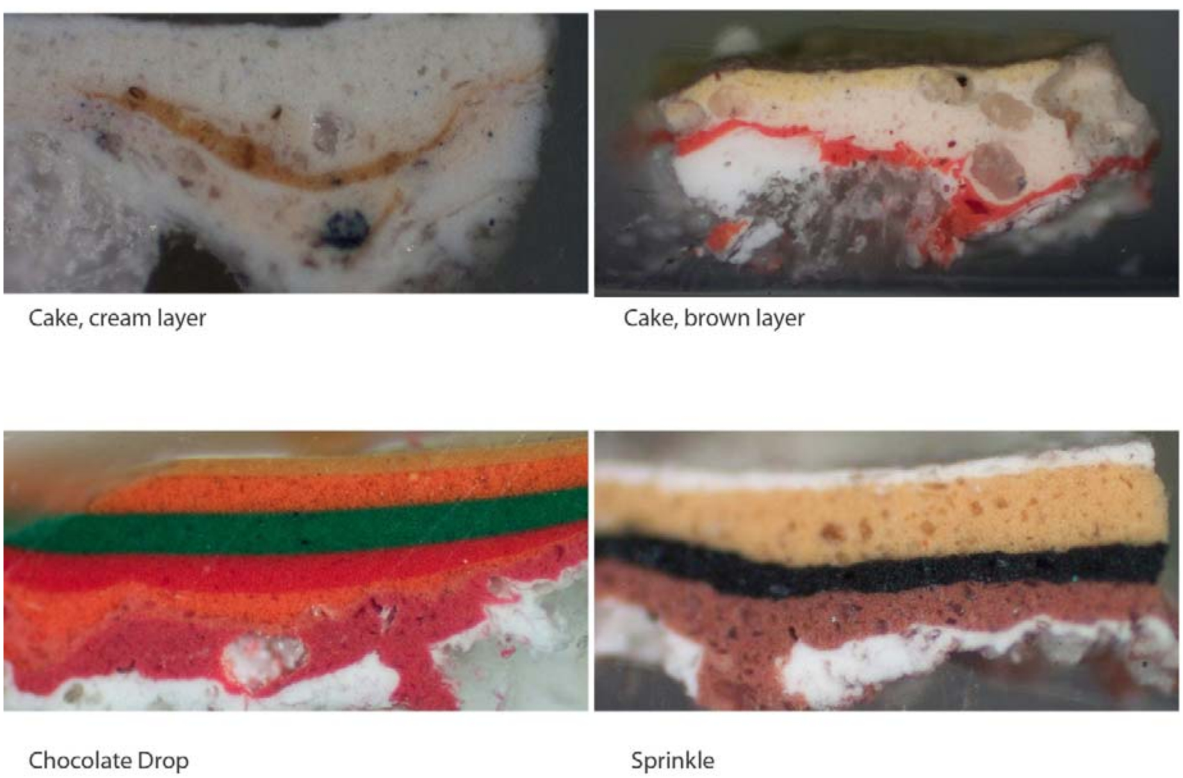


Fig. 13. Composite of cross sections imaged at 125x (Photographs by Elizabeth Nunan)

5. STUDYING PAST TREATMENT

There is no recorded history of cleaning *Floor Cake* prior to 1998. However, MoMA oral history indicates it may have been cleaned twice before. The 1998 condition reports notes that the *Cake* was soiled in areas that rested on the floor and along the entire top of the upper layer. The 1998 treatment included overall dusting and vacuuming and then only the top layer was cleaned. The filling was removed and the canvas was cleaned with a 2% solution of tri-ammonium citrate in de-ionized water, applied with a brush and cleared twice with de-ionized water. After drying with blotters, the filling was then replaced. To aid in determining the course of the 2010 treatment, it was necessary to understand the possible effects of the previous treatments.

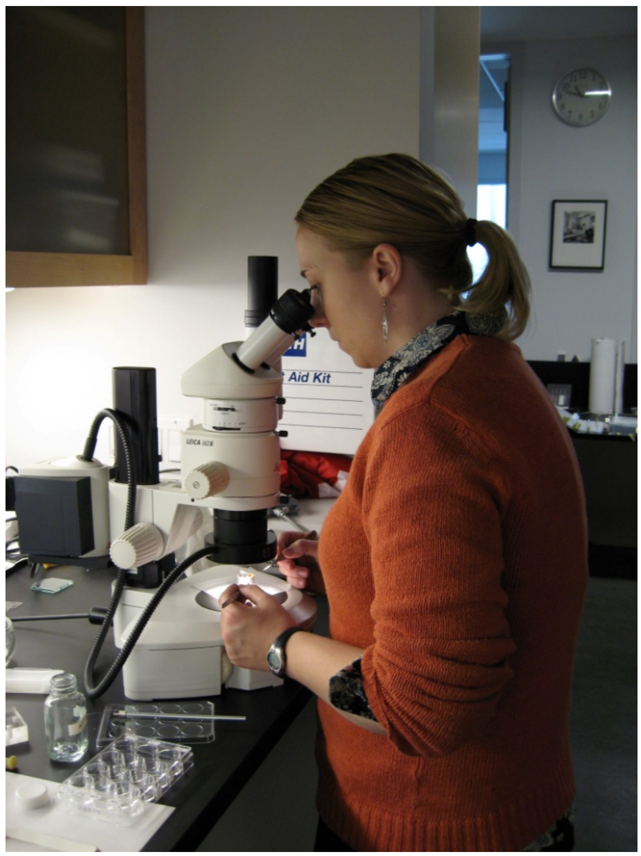


Fig. 14. Preparation of extracted fiber samples for analysis with FTIR-ATR (Photograph by Albertson)

5.1 ANALYSIS OF PAST TREATMENT

Analysis was performed to determine if the previous cleaning solution had left residue, and to ascertain if the process had weakened the canvas fibers thus contributing to cracking and paint loss. During examination it was noted that several canvas fibers were standing proud of the paint surface. A number of fibers were extracted from the upper layer of cake that had been previously treated, as well as from the untreated lowest layer (fig. 14) Scanning Electron Microscopy/ Electron Dispersive Spectroscopy (SEM/EDS) was used to attempt to locate residue of tri-ammonium citrate from the upper layer of *Cake* (fig. 15). This technique would reveal nitrogen if ammonia from the cleaning solution had clung to the canvas fibers. SEM did not reveal any nitrogen. The surfaces of the fibers were also analyzed with Attenuated Total

Reflection Fourier Transform Infrared (ATR-FTIR). There were no significant differences in the spectra between the fibers extracted from the treated upper layer of cake versus the ones from the lower untreated layer. These fibers were compared to control fibers soaked in 2% Tri-ammonium Citrate solution. The spectra from the soaked fibers were noticeably different from that of the treated and untreated fibers (fig. 16). Testing has not detected residue from the 1998 cleaning, suggesting that either the TAC was cleared or that the methods used could not detect the trace amounts.

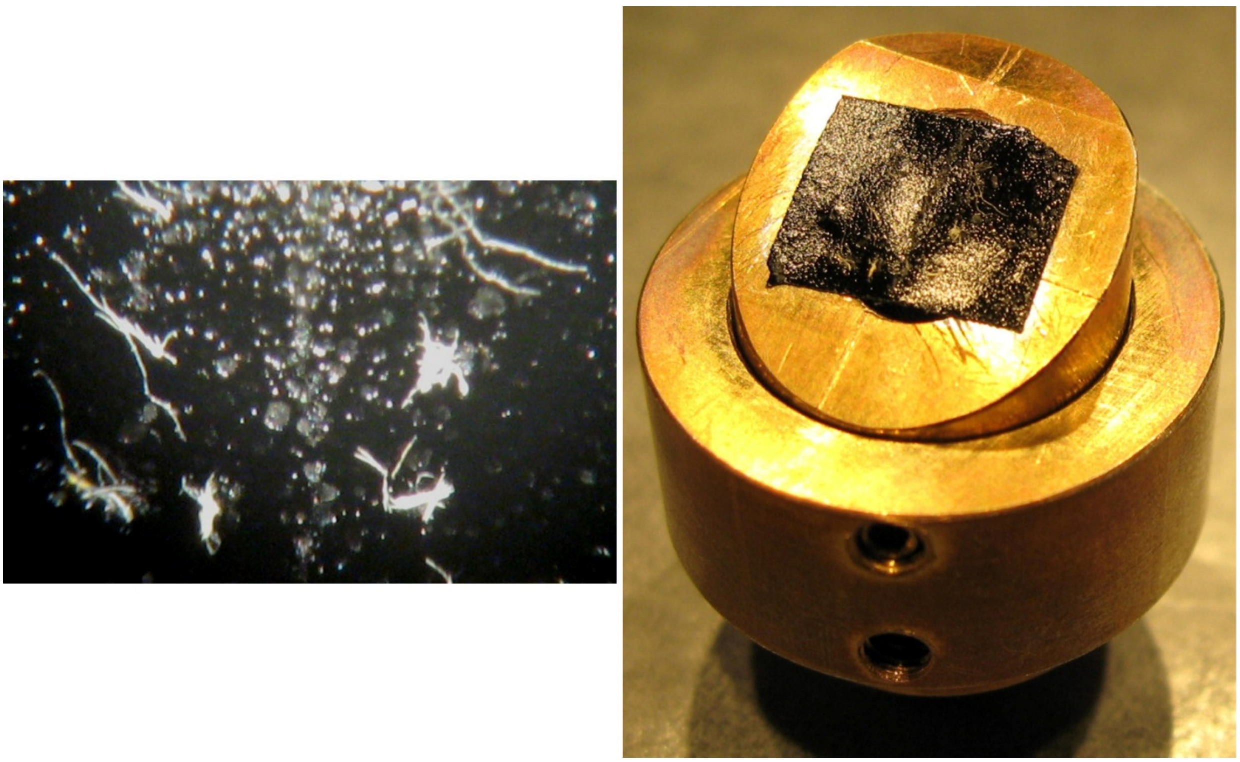


Fig. 15. View of fibers from canvas yarn on stub for SEM (Photograph by Albertson)

6. TREATMENT

In looking for new treatment approaches for acrylics, conservators must consider the inherent problems associated with cleaning acrylic paint such as water sensitivity and the solubility of additives after surfactant migration (Ormsby et al. 2009, 186–195). The GCI CAPS Colloquium held in 2009 was closely studied when developing a cleaning strategy. Dry cleaning has been considered one of the safer methods for surface cleaning acrylics, therefore testing on *Floor Cake* began with grated eraser crumbs and dry cleaning soot sponges to observe the dirt reducing capability of these techniques (fig. 17). Most dry methods were effective, but not all were appropriate for the large expanse of *Floor Cake's* painted surface (table 1). The grated erasure crumbs became too easily lodged in the interstices of the cracked paint. Rubber soot sponges, very gentle and highly effective, were the most successful of all of the methods tested (fig. 18).

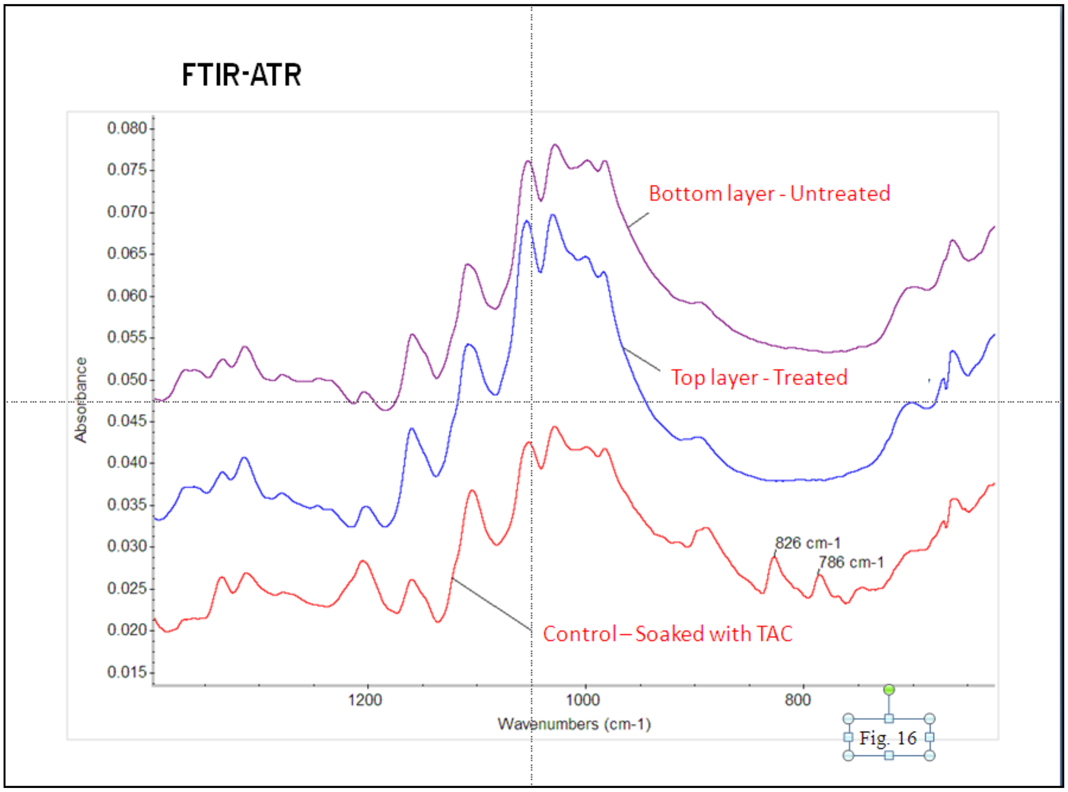


Fig. 16. FTR-ATR Spectra of canvas fibers extracted from upper layer and lower layer versus control fiber. Sample prepared by authors and analysis provided by Chris McGlinchey.

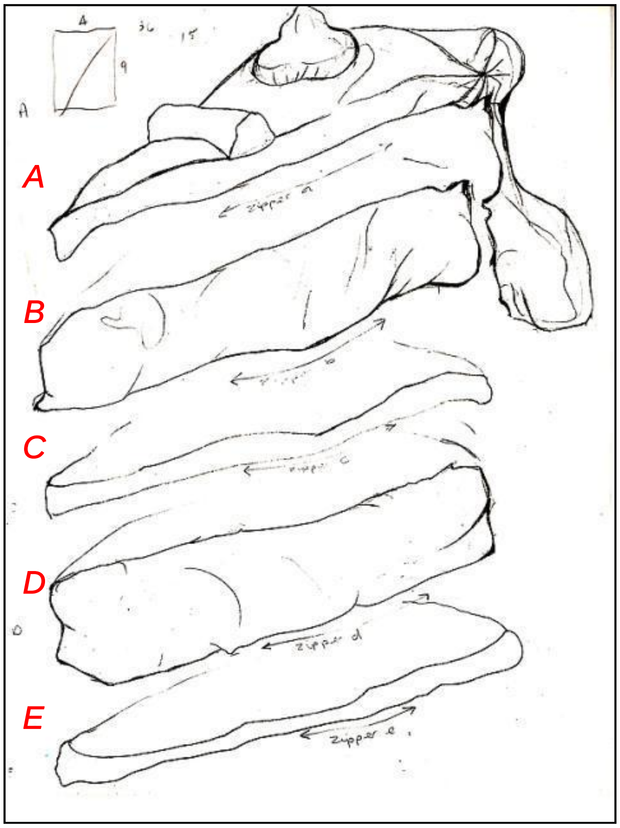
Fig. 17. Dry cleaning materials used for testing grime removal (Photograph by Delidow)

Table 1. Dry cleaning tests and results

Test	**Result**
Staedtler Mars Plastic Eraser	Removes very little dirt—too aggressive
Staedtler Mars Plastic Eraser crumbs	Removes a fair amount a dirt
Dry Cleaning Sponge	Removes some dirt—too aggressive on fragile paint
Groom Stick Molecular Trap	Removes some dirt—too aggressive on fragile paint
Di water	Slight change
Absorene	No apparent change

Fig. 18. Gently wiping wedges of soot sponge over paint surface (Photograph by Albertson)

To understand the nature of the grime the methods shared at the GCI CAPS Colloquium were explored and tested. Working with MoMA paintings conservator Michael Duffy, a colloquium attendee, pH and conductivity testing was conducted on the surface of the layers of the cake. Each of the five layers was tested in three separate locations. The pH was tested with a Horiba twin Micro pH meter and Whatman Filter Paper discs, while conductivity was measured with the Horiba B-173 Micro Conductivity Meter (fig. 19). The average pH of all these locations was 6.2, while the conductivity was .33 m/s (table 2). While initial cleaning tests with neutral water and saliva both on hand rolled cotton swabs exhibited effective moisture cleaning, it was felt that working with a tailored pH would prove to be the most gentle and effective. The Modular Cleaning Program[3] was used to assist with developing an aqueous cleaning solution. The MCP was developed by paintings conservator Chris Stavroudis in conjunction with Professor Richard Wolbers, of Winterthur. The testing of different combinations of surfactants, chelators, and buffers with the computer program was ideal for recipe preparation, allowing for quick alterations to the cleaning solution (fig. 20). Different formulas at pH's ranging from 6 to 7 were tested to determine what was most effective. Additionally, conservators experimented with methods of application by comparing the PVOH sponge to hand rolled cotton swabs (fig. 21). Ultimately the PVOH sponge was selected as the best tool for both application of solution and for clearance due to the smooth minimally abrasive surface and its great absorption.[4]



Layer	pH	Conductivity - mS/cm
A1	6.57	.49
A2	6.3	.70
A3	6.6	.31
B1	6.5	.26
B2	6.25	.85
B3	5.8	.24
C1	6.3	.38
C2	6.3	.25
C3	6.3	.30
D1	6.26	.146
D2	6.08	.104
D3	6.25	.189
E1	5.8	.27
E2	5.9	.196
E3	5.6	.22

Table 2. Conductivity measurements of layers (Drawing by L. Davis)

Fig. 19. Collecting samples for pH measurements (Photograph by Delidow)

Fig. 20. Conservators Delidow and Albertson prepare and test solutions with the Modular Cleaning Program (Photograph by Albertson)

Fig. 21. Sample board of applicators for cleaning solution (Photograph by Delidow)

Cleaning emulsions discussed at the GCI CAPS Colloquium were also explored. A 3” x 3” square on the bottom of the lower layer of cake was used to test cleaning with Velvesil FX Gel. Velvesil is a decamethlycyclpentasiloxane that comes in powder form. Velvesil was introduced as a solvent medium to aid in the reduction of paint swelling and leaching of surfactant, by allowing small droplets of emulsified water to be suspended and to act as cleaning cells into which water soluble grime can be held (fig. 22). Velvesil was diluted with a silicone solvent and emulsified with a small amount of water. However, upon gel clearance, grime removal was far less obvious as compared to aqueous solution tests, with either a swab or a sponge. While this may be a very useful tool for cleaning tensioned acrylic paintings, a gel application was not a great fit for this treatment. It seemed impractical to be able to adequately clear a gel from such a highly irregular un-tensioned surface. The possibility of staining areas of bare canvas and in areas where the paint layer was particularly thin was also a concern.

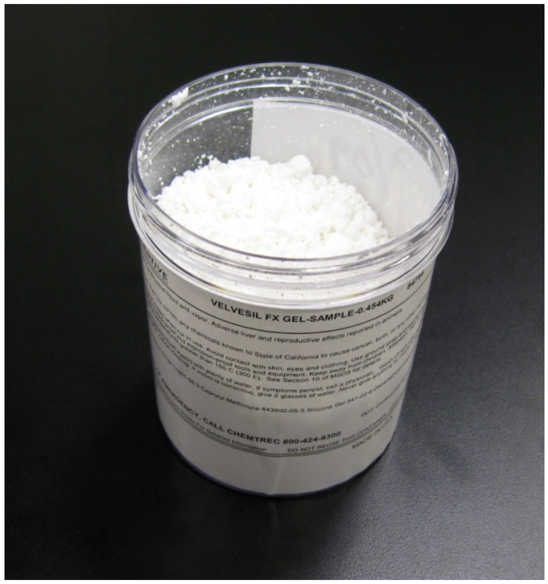


Fig. 22. Velvesil FX Gel (Photograph by Delidow)

After testing, the chosen aqueous solution was derived from the Modular Cleaning Program (MPC).[5] Stock solutions were prepared in 500 ml bottles in addition to several bottles of pH 6.5 water clearance solution. Initially, the *Cake's* filling was removed with the belief that a flat surface would provide control with the cleaning. However after the first layer, the stuffing was kept inside to provide a measure of support for the paint film. The canvas and paint have a crack and crease memory after being together for nearly 50 years. Additionally, keeping the stuffing inside the layers kept the wear and tear overall to a minimum. The final treatment method selected, began with dry cleaning with soot sponges, where the paint was less cracked. The cleaning solution was then applied to wedges of PVOH sponge and the wedges gently patted and wiped over the surface. The solution was cleared two times with pH 6.5 water on clean sponge wedges. This method was able to remove approximately 30% of the dirt and grime from the surface, an acceptable result as further dirt removal would require a more aggressive treatment. The drop and sprinkle were removed from the cake for the treatment and the fatty acid bloom reduced with saliva on rolled cotton swabs (fig. 23).

Over the years the polyurethane foam has lost volume resulting in a deflated *Cake*. Different fillings were investigated to search for a material that is archival and light weight. Since a large majority of the foam is soft and intact additional stuffing was added to the original foam—instead of totally replacing it. After consultation with colleagues in textile conservation, a 1 lb. density Ethafoam was chosen and contained in muslin bags (Britton, 2010) (fig. 24). With this method, supplemented materials would be kept together and easily distinguished from the original, allowing for easy removal in the future. This supplemental stuffing was archival, efficient, and low cost. Bags were inserted into the deflated layers of *Cake*, placing the stuffing in key areas to support vulnerable parts (fig. 25).

Fig. 23. During treatment image of cleaning of chocolate drop (Photograph by Albertson)

Fig. 24. Small cut Ethafoam sections in muslin bags (Photograph by Delidow)

Fig. 25. Authors inserting the supplemental stuffing (Photograph by Delidow)

Fig. 26. Consolidation of fragile areas with Lascaux (Photograph by Albertson)

Fig. 27. Before and after treatment details of the chocolate drop (Photographs by Albertson)

Fig. 28. *Floor Cake* after treatment (Photograph by Albertson)

The treatment was completed with additional minor consolidation where there was a high risk of paint loss (fig. 26). 81012 Lascaux Medium for Consolidation was chosen for its low viscosity and matte appearance upon drying. Areas of frayed or broken canvas fibers were consolidated using a combination of sturgeon glue and wheat starch paste, which is common in canvas tear repair. Minor filling was completed on the toppings with Becker's Latex spackle followed by integration with watercolors (fig. 27). *Floor Cake* was reassembled on a trolley in the conservation lab. The toppings were reattached with heavy weight cotton thread to the upper layer of *Cake* in their 1975 acquisition documentation locations (fig. 28).

7. CONCLUSION

The current research on the cleaning of acrylics indicates that the reduction of water contact or reduction of time in contact with the surface will minimize paint swelling and removal of surfactants, which is of particular importance for newer untreated surfaces. Floor Cake is nearly fifty years old and has been cleaned with aqueous solutions twice before, so conservators were not overly concerned with surfactant removal. Our analysis of earlier treatment could not detect the presence of tri-ammonium citrate residue, suggesting that proper clearance of chelating agents is possible. Utilizing a combination of dry and wet cleaning techniques, grime was extracted with minimal mechanical action. This project brought sculpture and paintings conservation together and took advantage of the Modular Cleaning Program, not typically used in objects conservation. Whether using aqueous solution/gel or dry based methods to clean acrylics, each must be carefully adapted by conservators to reflect the needs of complex art objects.

New conservation guidelines for movement and installation of *Floor Cake* will ensure the use of gloves and no longer advocates adjusting the layers by "fluffing". A conservator should be present during installation to make adjustments to the interior components and from inside or beneath the canvas, rather than manipulating the paint layer from the surface. In addition the use of stanchions or a platform is strongly recommended to keep visitors from touching or accidentally kicking the sculpture. Over the course of the year that *Floor Cake* spent in conservation, blog posts were made providing treatment strategies and updates to encourage the conservation and scientific community to share thoughts and insight, as well as to share the treatment progress of this iconic pop sculpture with the general public.[6]

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NOTES

1. Getty Conservation Institute. "Cleaning of Acrylic Painted Surfaces: Research into Practice." A colloquium hosted by Getty Conservation Institute Education and Science departments and Paintings Conservation Department, (GCI CAPS 2009).

2. Acquisition records from MoMA Department of Sculpture and Painting files, 1975 indicate that Oldenburg stated he was using latex and Liquitex on his 1962 soft sculptures.
3. Modular Cleaning Program http://cool.conservation-us.org/byauth/stavroudis/mcp/ (accessed 07/03/2012).

4. PVOH sponge Cross- linked polyvinyl alcohol sponge. For more information on sponges see Albertson, Cynthia. "Surface Cleaning: Analysis of Sponge Abrasion on Paintings", Art Conservation Department at Buffalo State College, Poster AIC 2008.

5. Prepared Stock Solution derived from testing with the aid of the Modular Cleaning Program. The pH was targeted at 6.5 and the conductivity 0.33 m/s.
500 mL distilled water, 5.2 grams of Bis-tris, 4.8 g of citric acid, 0.5 g of Brij 700, 2.3 mL sodium hydroxide (10%), 0.4 mL of hydrochloric acid (10%), pH 6.5 with sodium hydroxide (10%).

6. INSIDE/OUT at www.moma.org/explore/inside_out/category/conservation (accessed 07/3/2012).

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Stavroudis, C., T. Doherty, and R. Wolbers. 2005. A new approach to cleaning I: Using mixtures of concentrated stock solutions and a database to arrive at an optimal aqueous cleaning system. *Western Association for Art Conservation Newsletter* 27(2): 17–28.

Wolbers, R. 2000. *Cleaning painted surfaces: aqueous methods*. London, England: Archetype Publications Ltd.

SOURCES OF MATERIALS

Dry cleaning sponge: vulcanized rubber sponge
Talas
330 Morgan Ave
Brooklyn, NY 11211

PVOH sponge Cross- linked polyvinyl alcohol sponge.
Peregrine Brush ad Tools
1211 S. 60 W.
Wellsville, UT 84339
www.brushesandtools.com

Brij 700 Brij
ICI Organics, England
Trademark for a series of nonionic surfactants that work well in both alkaline and acidic solutions. They are composed of polyoxyethylene ethers of higher aliphatic alcohols.
Available from Fischer Scientific

Bis-tris
Bis-tris- 2-bis(2-hydroxyethyl)imino-2-(hydroxymethyl)-1,3-propanediol.
Available from Fischer Scientific

Velvesil FX Gel
Sample-O.454KG 84786, 10043-11-5 Boron nitride 17955-88-3 Caprylyl Methicone 443892-05-5 Silicone Gel 541-02-6 Decamethylcyclopentasiloxane
Momentive Performance Materials
Waterford, NY 12188
(518) 237-3330

Ethafoam Polyethylene foam, 1”, 2” 4” planks, 2.0 lb density
Masterpak
145 East 57th Street
New York New York 10022
service@masterpak-usa.com

Cotton Drawstring Muslin Bags
15” x 12” Rose Garden Creations.
www.amazon.com

White 100% cotton heavy-weight thread
Coats and Clark
P.O. Box 12229
Greenville, SC 29612-0229
www.coatsandclark.com

MARGO DELIDOW is a sculpture conservator with a focus on modern materials and co-owner of Whryta Inc, an objects conservation studio in New York City. She received her MA/CAS at Buffalo State College and is currently an Andrew W. Mellon Teaching Fellow at the Conservation Center IFA-NYU. She has presented and authored papers including the Future Talks 0011 Munich, 2011; American Institute for Conservation, Milwaukee, WI 2010; Future Talks 09 Munich, 2009; Plastics: Looking at the Future, Learning from the Past, London, 2007; and Canadian Association for Conservation of Cultural Property, Victoria, British Columbia, 2004. Address: Conservation Center, Institute of Fine Arts, New York University, 14 East 78th Street, New York, NY 10075. E-mail: margo.delidow@nyu.edu

CYNTHIA ALBERTSON received a MA with a Certificate of Advanced Study in Conservation as well as an earlier MA in History with Museum Studies both from Buffalo State College in Buffalo, NY. She is an assistant conservator at the Museum of Modern Art. Her current research includes the examination and retreatment of MoMA's collection of paintings by Piet Mondrian, as well as the technical analysis of the portable frescoes of Diego Rivera. Address: The Museum of Modern Art, 11 West 53rd Street, New York, NY 10019. E-mail: cindy_albertson@moma.org