CONSERVATION PERSPECTIVES

THE GCI NEWSLETTER

FALL 2016

CONSERVING MODERN PAINTS

The Getty Conservation Institute

A Note from the Director

Photo: Anna Flavin, GCI

In the twenty-first century, the conservation of modern paints has emerged as a notable, even critical, subject of research. The great diversity in materials used in producing modern paints presents a significant challenge for those charged with caring for art created with these paints, as the paints' sensitivity to aging, environmental conditions, and conservation treatments is governed by their particular properties.

The Getty Conservation Institute's engagement with conservation issues related to modern paints dates back to 2002 when the Institute joined with Tate in London and the National Gallery of Art in Washington, DC, on an integrated collaborative effort to study modern paint materials identification, characterization, and cleaning. Since then, the GCI's work in this area and the diligent efforts of many others in the field have expanded to address a broad range of conservation issues connected to modern paints.

In this edition of *Conservation Perspectives*, we offer an update on work that the GCI is undertaking with respect to modern paints. In the feature article, Bronwyn Ormsby, principal conservation scientist at Tate, and Tom Learner, head of Science at the GCI, examine progress in research related to cleaning approaches for modern acrylic and oil paints—progress that is giving conservators more information and options with respect to the cleaning of paintings.

The feature is followed by an article by Abigail Mack, John Escarsega, and Rachel Rivenc, who describe a GCI project that explores how paints formulated for military assets may help save outdoor painted sculptures in terms of preservation and appearance. In a third article, Pia Gottschaller delineates the Institute's study of artworks from the Colección Patricia Phelps de Cisneros, on loan to the Getty as part of the Pacific Standard Time: LA/LA initiative; the research seeks to develop a comprehensive understanding of the materials and techniques used by artists working in the concrete and Neoconcrete veins in Latin America during the mid-twentieth century. In the fourth and final article, paint manufacturer Mark Golden provides insights into the concerns and considerations that those creating commercial paints must contend with, and he offers thoughts about greater collaboration between the conservation field and paint manufacturers.

In the roundtable discussion for this *Conservation Perspectives*, we have done something a little different by turning to three contemporary artists—Jason Martin, Ruth Pastine, and Analia Saban—whose innovative work with modern paints raises interesting and provocative conservation issues. Topics discussed include the effects they seek to achieve with paint, the qualities important to them in the paint material, and their feelings about the longevity and conservation of their work.

While the Institute's research into the conservation issues of modern paints has continued for nearly a decade and a half, in recent years the considerable support we have received from the GCI Council has made possible more comprehensive explorations of some of the significant conservation questions surrounding these paints. For this, we are particularly grateful.

Timothy P. Whalen

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Detail of Frank Auerbach's *Julia* (1990). Acrylic on board, 12 1/8 x 14 in. (30.8 x 35.6 cm). © Frank Auerbach, courtesy Marlborough Fine Art, London.

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RECENT DEVELOPMENTS IN THE

BY BRONWYN ORMSBY AND TOM LEARNER

The last decade has seen a considerable amount of research in the scientific study of modern paints. One area where significant advances have been made is the development and evaluation of potential cleaning treatments. Cleaning accumulated dirt off an unvarnished painted surface is arguably the most commonly executed conservation treatment on modern and contemporary paintings and was identified by a number of researchers by 2005 as a subject in desperate need of research and focus. Before this research, most conservators had very few options for cleaning modern painted surfaces—typically a handful of basic aqueous systems and a range of erasers and sponges.

Perhaps more critically, there was no real understanding of the effects these cleaning systems might have on the paints themselves, especially over the long term. What conservators did know was that cleaning dirt directly off an unvarnished modern paint surface was highly problematic, with an uncomfortably high incidence of paints that were vulnerable to pigment removal, surface abrasion, gloss changes, patchy cleaning, or other forms of undesirable change or damage.

In 2006 the "Modern Paints Uncovered" symposium—held at Tate Modern and organized by Tate, the National Gallery of Art, and the Getty Conservation Institute (GCI)—brought together over two hundred conservation professionals to take stock of current thinking about the conservation of modern paints. An entire section of the symposium was devoted to research into measuring the effects of simple cleaning systems on acrylic dispersion (often called emulsion) paints. Some broad trends were noticed: water-based systems tended to be reasonably decent cleaners, but they would typically cause a significant level of swelling in the paint and would also readily dissolve the migrated surfactant on the surface of the paint film, one of the more abundant additives still present in the dried film. On the other hand, mineral spirits (aliphatic hydrocarbon solvents) seemed to prompt little swelling and were far less likely to disrupt the migrated surfactant. However, they were not particularly good cleaning systems. In summary, neither system looked ideal. Moreover, there was no overall consensus on how to usefully evaluate these observations. In fact, different researchers drew different conclusions about what type of change was acceptable, especially concerning the removal of migrated surfactant. It also became clear that many conservators felt they should wait (presumably very patiently!) until the scientific research had progressed further.

Since then, research has flourished, and approaches have changed as a result of this increasing body of information. A vastly expanded range of potential cleaning materials have now been proposed, developed, and tested by research groups across Europe and North America, and a broader range of paint types has been included in many studies, including acrylics, PVA (polyvinyl acetate), oil-modified alkyd paints (fast-drying oils), and, of course, modern oil paints. Interestingly, many of the nonaqueous systems are now being evaluated for use on a range of water-sensitive materials, including lacquer and water-gilded surfaces.

There is also growing acceptance that alongside scientific researchers, conservators themselves play a crucial role in developing safer cleaning systems. Progress relies on incorporating feedback on recently developed options, experiences using cleaning systems on works of art, and methods of successfully manipulating cleaning options.

MODERN PAINT CONSERVATION CHALLENGES

Conservators face considerable challenges when cleaning works of art made with modern paints. One major cause is the complexity of modern paint formulations. Gone are the days of simply grinding a pigment powder into a binder. Modern paints contain all kinds of additives essential for (among other things) creating an optimum consistency, a long shelf life, or an appropriate drying time, as well as resisting mold growth. Water-based dispersion paints are particularly complicated, and it is not uncommon for such paints to contain more than

CLEANING OF MODERN PAINTS

John Hoyland (1934–2011), *North Sound*, 1979, acrylic paint on canvas, 2286 x 2438 x 26 mm. In the collection of Tate Gallery. © John Hoyland.

Former Tate Conservation Science Fellow Josefina López evaluates new microemulsions for use on acrylic paint samples. Photo: © 2015 Tate.

ten components in addition to the pigment and binder. Each additive, although perhaps only present at a fraction of a percent by weight, may have a significant effect on how a particular paint responds to cleaning systems. Complicating things even further, the identities of these additives are among the secrets most guarded by all paint manufacturers, making any systematic study completely impossible.

Then there is the inherent challenge of creating meaningful test samples for use in determining the relative safety of a particular cleaning treatment. For comparative measurements to be made, large swatches of uniformly applied paint samples are necessary, but these will react differently than will forty-year-old paint layers on works of art, particularly where an artist might have manipulated the paint, thinned it with solvent, mixed in other materials, and then allowed it to age naturally. There are of course methods that mimic the ways objects change with age, but concerns remain over the validity of accelerated aging procedures. With cleaning, dramatically different results can also be achieved by applying different pressure, movement, or application methods, even when using the same cleaning agent. All of these practical issues are very real and need to be factored into any testing and evaluation—or at the very least the limitations of testing must be openly discussed. Otherwise, results can be meaningless and of little use to the practicing conservator.

For unvarnished painted surfaces, there are also risks associated with not removing dirt from them. If dirt remains on a paint surface for too long, it can become embedded in the paint film, resulting in permanent disfigurement and possibly initiating deterioration at the paint surface. This is particularly true of the relatively soft acrylic dispersion paints and of modern oil paints that have developed a soft surface layer. Unfortunately, preventive conservation practices such as glazing may not be appropriate for all modern and contemporary paintings since many of them are large or unframed, or because of other aesthetic considerations. There may also be concerns about the formation of microenvironments that may enclose volatile, potentially harmful materials within the glazed frame.

CLEANING ACRYLIC PAINTED SURFACES

Most of the recent advances in cleaning are the result of research into acrylic dispersion paints. As noted earlier, acrylic dispersion paints are vulnerable to swelling caused by water, as well as by many polar and aromatic hydrocarbon–based organic solvents. Water, which is often the most efficacious general solvent for surface cleaning, can promote the swelling of paint films, the removal of migrated surfactants from the surface, and microlevel extraction of paint constituents, such as surfactants (used primarily in the acrylic medium) and pigment dispersants (used to help make a smooth paint with well-distributed pigment). Research over the last ten years or so has highlighted the many factors that can influence the amount and speed of this removal and/or extraction, which vary according to paint pigment type,

Josefina López using stereomicroscopy to examine the effects of surface cleaning materials on acrylic paint samples. Photo: © 2015 Tate.

age, quality, and thickness of the paint, as well as the cleaning application method, exposure time, and solvent type. It has therefore been difficult to identify many general trends, but we know that the risk of paint swelling and surfactant extraction decreases with paint age and that migrated surfactant on paint surfaces can degrade with light exposure alone.

Substantial progress in research on the cleaning of acrylic painted surfaces has, in part, advanced through the use of methods that test large numbers of variables in short periods of time. The ongoing collaboration of the GCI, Tate, and the Dow Chemical Company is an example of this approach, although other researchers have adopted similar methods. Dow made available their range of high-throughput (HTP) analytical devices, which allowed the rapid screening of extraordinary numbers of potential cleaning solutions, where specific details on the effects of varying the percentage of each additive on the efficacy of the overall cleaning system could be fully explored. Part of the HTP setup included some instruments that monitored changes to paint gloss and color and some that could detect changes in flexibility. Others helped monitor the effects of the cleaning systems on migrated surfactant removal and detected any residues left at the surface after cleaning. The promising cleaning systems were then subjected to more relevant testing procedures, including hand-held swabbing, working directly with conservators to understand and evaluate some of the factors that could not be built into the HTP protocols.

One of the first results of this approach came from exploring the influence of pH on the cleaning ability of aqueous cleaning systems. Recent research by Richard Wolbers has furthered our understanding through exploring how adjusting the pH and conductivity of deionized water can help minimize the swelling and extraction potential of aqueous cleaning options when used alone or in combination with other solvents or gels.[1]

Other HTP research included the testing of combinations of additives such as surfactants and chelating agents, which increased the cleaning efficacy of both aqueous and nonpolar (in this case hydrocarbon-based) cleaning systems, resulting in the introduction of some new surfactants to the profession. More recently, a whole range of silicone solvents has also been introduced; they seem to offer effective cleaning power without causing undue paint swelling. Silicone solvents—which display extremely low polarity and surface tension and also have very low toxicity—were introduced to the conservation field by Wolbers in 2009. Since then, they have been increasingly used in conservation, notably for cleaning water-sensitive paint and other surfaces.[2]

Finally, a new class of cleaning systems has been developed and tested. Known as "water-in-oil" microemulsions, they combine the respective benefits of aqueous and nonpolar (hydrocarbon or silicone) solvent systems. These systems—in which water is dispersed within a nonpolar solvent and stabilized with surfactants—exploit the high cleaning power and adaptability of the aqueous environment and the relatively low swelling environment offered

by nonpolar hydrocarbon or silicone solvents. At this point, four microemulsion cleaning series have been produced through our ongoing collaboration with Dow. Each iteration was designed for certain conservation situations and modified after feedback from trials performed by practicing conservators.[3]

CLEANING MODERN OIL PAINT

A serendipitous outcome of the research into developing and evaluating cleaning systems for acrylic dispersion paints is that the same systems appear to be promising for removing deposited dirt and other unwanted materials, such as varnishes, from other water-sensitive surfaces, including many modern oil paintings (loosely defined as those from the twentieth and twenty-first centuries). Water sensitivity in modern oils is an intriguing issue; it is often hard to predict, and it can be exhibited by both thin and impasto paints, as well as on both glossy and matte surfaces.

Modern oil paintings are, in fact, beginning to present a whole range of challenging conservation issues in addition to water sensitivity. Regularly observed phenomena include the formation of soft, sticky, and vulnerable skins of oil medium on paint surfaces; surface efflorescence; insoluble thin surface crusts; solvent sensitivity; and the increasing frequency of paint regaining fluidity, possibly resulting in drips flowing down the painting surface.

An example of an oil paint swatch from the artists' materials manufacturer Winsor & Newton, captured at 1.54 X magnification. Tate holds a donated Winsor & Newton swatch collection dating from 1945 to 2003. Photo: © 2015 Tate.

Some of the factors contributing to these changes include the formation and migration of degraded oil components to paint surfaces and the use in artists' oil paints of semi- or nondrying oils such as safflower. Interviews with artists' paint manufacturers have helped identify additives (such as driers) that may contribute to water sensitivity directly, or indirectly through negatively influencing paint drying and aging processes. Finally, the current disuse of lead compounds, for environmental and health reasons, may also contribute to the instability and sensitivity of modern oil paints, which do not benefit from their stabilizing effects.

The current Cleaning Modern Oil Paints (CMOP) project—a collaboration of Tate, several other EU partners, and the GCI—and the newly formed Modern Oils Research Consortium (MORC) aim to explore several aspects of modern oil paints, including further characterization of the causes and mechanisms of paint deterioration that may lead to water sensitivity. Also to be studied are the effects of solvents on sensitive oil paints and the development of low-risk surface cleaning systems. These processes will be systematically evaluated through trials on test samples and, eventually, on case study works of art following the collaborative model successfully developed for acrylic dispersion paints.[4]

RESEARCH INTO PRACTICE

Exploring what may be regarded as "acceptable" change after conservation treatments such as surface cleaning is also gaining attention, especially at a time when analytical techniques have become so sensitive that they can detect changes in materials far below the threshold of detection by the human eye, prompting the "So what?" question to creep into discussions. Although change of any description, arguably at any scale, during a cleaning treatment is never desirable, the changes detected need to be placed in context and may be perhaps most usefully evaluated in a risk assessment. For example, if a trace of original material is removed from a painting during cleaning, but this removal is completely invisible to a viewer and does not adversely affect the flexibility of the paint, then can that change be tolerated if the overall cleaning of the work results in significant aesthetic improvement?

More research, engagement, debate about research results, and discussion are clearly required among scientists, conservators, artists, collectors, and paint manufacturers to further advance this important area of investigation. At the same time, conservation treatment strategies need to be designed with awareness of the unique properties of each of these modern paints, knowledge of the likely aesthetic effects of cleaning, and informed understanding of the risks associated with each cleaning system.

Similarly, as we move forward with modern oil paint research, increased study of the sometimes alarming changes occurring with oil paints will lead to a better comprehension of the changes taking place with time, with exposure to the environment, and

Above: A Cleaning of Acrylic Painted Surfaces (CAPS) workshop exercise, in which participants evaluate the relative swelling effect of different types of pH and conductivity-adjusted waters on unsoiled acrylic paint samples. Photo: © 2015 Tate. **Right: The July 2016 CAPS workshop**, organized by the GCI with the John and Mable Ringling Museum of Art in Sarasota, Florida. Instructor Bronwyn Ormsby overlooks the work of conservator Shauna Young. Photo: Tom Learner, GCI.

with treatment, which should lead to more sophisticated, more appropriate, and lower-risk treatment strategies.

A key element in making meaningful progress with research into cleaning treatments over the last ten years has been the importance placed on receiving and integrating input from experienced conservators throughout the process, in addition to the scientific testing and systematic evaluations by conservators involved in the research. This can be done at many different levels, including ongoing dialogue between scientists and conservators, through collaborative case study treatments, and through a range of continuous professional development workshops, which, for this research, have proven to be particularly beneficial. The Cleaning of Acrylic Painted Surfaces (CAPS) series of workshops offered by the GCI is one such endeavor, in which the most up-to-date research is disseminated to a small number of experienced conservators, and, where practical, feedback is garnered during the workshop itself. Such discussion of interim (and even negative) results has facilitated useful dialogues regarding the pros and cons of various systems, helped to identify areas requiring further research or modifications that could be made to improve cleaning, and, most significantly, helped to determine if the outcomes were proving useful.

Looking ahead, it is expected that the various active research groups will continue to suggest and develop useful new options for conservators for cleaning a whole range of modern paints, each of the options being systematically evaluated and modified after receiving feedback through trials and professional workshops and from conservators using these systems in the studio. While this type of research will never produce the ultimate cleaning system for any one type of modern paint, we have already reached the point where it is unlikely that conservators will complain about having too few options available to them—and that really is progress.

Bronwyn Ormsby is principal conservation scientist at Tate in London. Tom Learner is the head of Science at the GCI.

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2. Chris Stavroudis, "Silicone-Based Solvents in Conservation. As Free Solvents and Components of Gel Systems and Microemulsions," *Colore e Conservazione, November 13–14, 2015, Politecnico di Milano* (Padova: CESMAR7/Il Prato, 2016): 176–84.
3. Bronwyn Ormsby, Melinda Keefe, Alan Phenix, Eleanor von Aderkas, Tom Learner, Christopher Tucker, and Christopher Kozak, "Mineral Spirits-Based Microemulsions: A Novel Cleaning System for Painted Surfaces," *Journal of the American Institute for Conservation* 55, no. 1 (2016): 12–31.
4. Bronwyn A. Ormsby, Alexia Soldano, Melinda H. Keefe, Alan Phenix, and Tom Learner, "An Empirical Evaluation of a Range of Cleaning Agents for Removing Dirt from Artists' Acrylic Emulsion Paints," *AIC Paintings Specialty Group Postprints* 23 (Washington, DC: AIC, 2010): 77–87.

UNLIKELY SYNERGIES

How Paints Formulated for Military Assets May Save Outdoor Painted Sculptures

BY ABIGAIL MACK, JOHN ESCARSEGA, AND RACHEL RIVENC

AS AN EXTENSION OF THE GROUNDBREAKING ABSTRACT ART movement of the early twentieth century, many artists in the second half of the century felt the need to create artwork that could be displayed outside of traditional gallery and museum spaces. Although the creation of outdoor memorials to war heroes and prominent public figures was well established historically, modern artists sought to engage in a different type of dialogue with the public in cityscapes and landscapes. This new conversation included abstract or abstracted subject matter and sharply departed from traditional outdoor materials, especially by embracing modern and painted metals. Now, half a century after modern art was placed outdoors, many sculptures require major treatment, and conservators are developing strategies for their long-term preservation.

Modern metals—such as aluminum, stainless steel, Cor-Ten, and structural steel—have distinct advantages for outdoor display by providing strength plus relative lightness, permitting spectacular architecture and artworks. Numerous artists chose to paint the industrial materials, both furthering aesthetic expression and providing important protection to the underlying metal. However, outdoor painted sculpture has turned out to require extensive maintenance and frequent conservation. No paint, whether for an automobile, water tower, or sculpture, will maintain its appearance indefinitely in an outdoor environment. Once the protective paint layer is breached, the metal substrate is vulnerable, often leading to rapid deterioration. Repainting, although not acceptable for indoor works of art, is a regular practice with outdoor painted sculpture, since these objects were made by fabricators, finished by industrial painters, and intentionally placed in environments where change is inevitable.

For the last thirty to fifty years, these sculptures have been on a continuous cycle of painting and repainting, both for preservation and in an attempt to maintain their intended appearance. Treatments often are massive logistical and financial endeavors that strain

Alexander Calder's *Flamingo* on permanent display in the Chicago Federal Center Plaza alongside the Mies van der Rohe buildings. Artwork: © 2016 Calder Foundation, New York/Artists Rights Society (ARS). Photo: Abigail Mack.

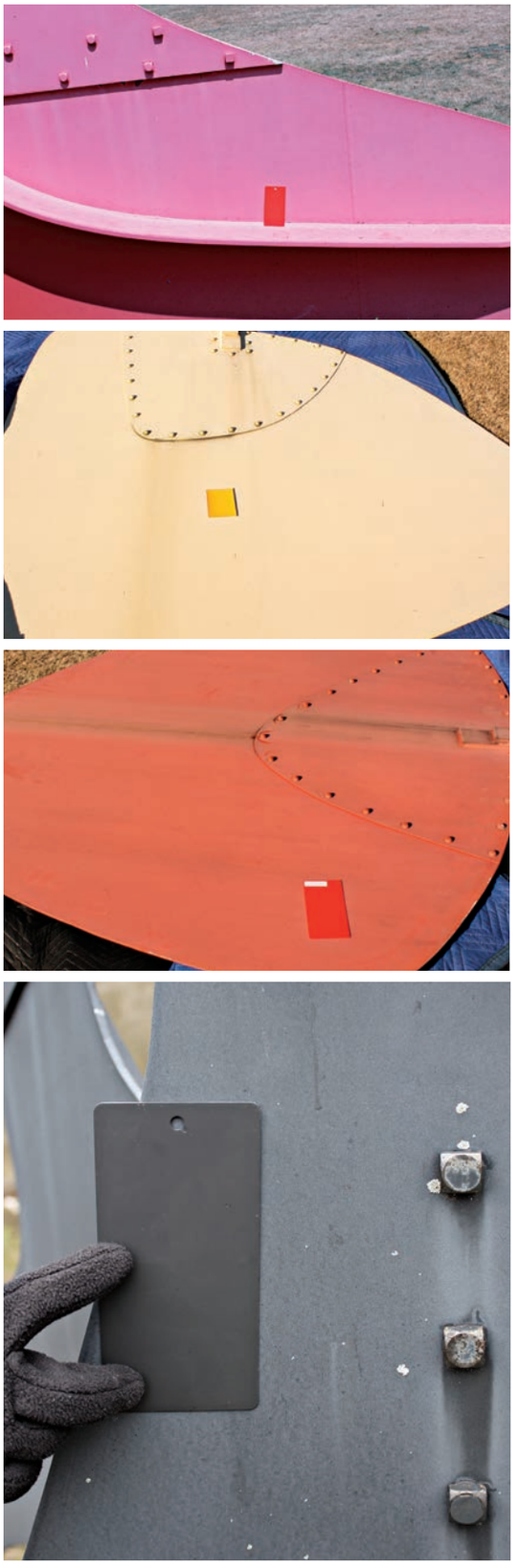
collectors and institutions. Because of additional factors including economic changes and shifting priorities, visitors to cityscapes and sculpture gardens have often only briefly witnessed newly painted objects as intended, before the artworks declined into years of visual disfigurement. Furthermore, paints were then chosen to best replicate the intended look of the object; as paint formulations changed and companies closed or transferred ownership, other paints were identified without established methods of ensuring aesthetic continuity. It is not always clear that current paints accurately represent artist intentions. Moreover, it has often been the practice to choose a more glossy paint than the original gloss level, with the expectation that it would then fade and chalk with weathering to the accepted level.

A DIFFERENT CONSERVATION APPROACH

Just as the artists of these modern monuments embarked upon new ground, conservators must take a different approach that focuses on maintaining the artist's "intended appearance" in contrast to traditional conservation ethics of preserving original materials and emphasizing reversibility and minimal intervention. The conservation focus shifts from preservation of the physical coatings to preservation of the artist's original intent for appearance, with the additional requirement of effective protection of the substrate. For this approach, the challenge is balancing a solid working knowledge of industrial outdoor coating systems with conservation guidelines for practice, which include sensitivity to the appearance the artist intended for the work.

Within the already difficult category of painted outdoor sculpture, matte (or low gloss) coatings are the most problematic in terms of durability. They are, however, ubiquitous, especially with sculptures from the 1960s, 1970s, and 1980s, when many artists favored a low gloss aesthetic. The poor durability of matte commercial coatings in outdoor settings is well known. They are unavoidably overloaded with pigments and flattening agents, and they contain a minimal amount of resin. These factors, often exacerbated by poor choices of these pigments and flattening agents, typically lead to fading, streaking, marring, and degrading with each passing season until sculpture surfaces no longer resemble the original unexposed coating and fall far from the artist's intended look. In some climates, severe weathering and subsequent disfiguration have been documented to occur in less than three years.

Although at first glance the worlds of the military and of art conservation could not seem further apart, they share a common reliance on matte coatings—with different but equally stringent requirements. For the military, concealment and camouflage necessitate matte coatings, while in the art world appearance is dictated by aesthetic choice and is therefore essentially nonnegotiable. In 2001 efforts at the National Gallery of Art in Washington, DC, to identify durable high-performance matte coatings designed for an outdoor environment led to an unlikely alliance between the US Army Research Laboratory (ARL) and art conservation professionals. As a result of this collaboration, existing military camouflage paint formulations were adapted for outdoor sculpture by Alexander Calder and Tony Smith. The results were extremely promising, although problems with the application properties of the paint were reported, arising in part from the very different working methods used by the Army and by conservators and local paint applicators. Recent coatings technology requires the implementation of sophisticated pretreatment steps and stringent industry surface preparation standards. The art conservation community is often still unaware of the additional steps used in industry or is generally reluctant to prepare sculpture surfaces to industry standards (using methods such as abrasive blasting) that have been proven to be necessary for good adhesion. The fact that some of these methods simply cannot be employed to the same degree with works of art is thought to have been the cause of some premature failures, and these problems highlight the need for further interprofessional collaboration.



Details of elements of outdoor sculpture works by Alexander Calder, with paint samples of their correct color, illustrating the change from weathering. From top to bottom: (1) *Five Swords*, on loan from the Calder Foundation to the Storm King Art Center in New York. (2) The yellow mobile element of *Five Empties* during deinstallation. (3) The red mobile element of *Five Empties* during deinstallation. (4) *Funghi Neri* at the artist's studio in Connecticut. Artwork: © 2016 Calder Foundation, New York/Artists Rights Society (ARS). Photos: Abigail Mack.

THE OUTDOOR SCULPTURE PROJECT

In recognition of the fact that outdoor painted sculptures are a very significant part of our modern artistic heritage that pose major conservation issues, the Getty Conservation Institute (GCI) in 2012 launched a project focused on their preservation. An initial experts meeting that year, organized by the GCI and hosted by the Metropolitan Museum of Art in New York, gathered a multidisciplinary group of professionals including conservators, scientists, curators, artists and artists' estates, paint manufacturers, fabricators, and industrial painters to discuss challenges and to help define a path forward. As a result of the meeting, a number of potential solutions to those challenges were suggested, one of which was to build bridges between the industrial paint world and the art world. An important component of this effort has been to partner with the ARL coating team to promote the formulation of a new generation of outdoor coatings with enhanced performance: the Marathon Series. Another essential aspect is to work with artists, artists' estates, and foundations to replicate the approved appearance of their artists' sculptures using this novel coating technology.

The ARL formulated these new paints with the express goal of increasing their durability and ease of application. The formulations include two critical innovations: one is the use of lower molecular weight resin systems, which decreases the amount of solvent needed and lowers viscosity, thus resulting in enhanced application properties. The other important technical advance is the use of Low Solar Absorbing (LSA) pigments, which contributes to effectively reducing solar loading—i.e., reflecting the sun's thermal energy and photons—not only reducing the heating of the coating and the underlying substrate, but also protecting the resin from harmful degradation of the coatings that occurs through ultraviolet exposure. Currently, because of the limited color choices of LSA pigments, the new paints have been formulated only in black, and a variety of different gloss levels are being explored to fit the different aesthetic requirements of artists including Louise Nevelson, Tony Smith, and Alexander Calder.

The artists' choice of color and gloss was crucial to their intended visual impact. Even black is not a simple color—rather, it has important subtleties and differences. Louise Nevelson described her choice of color in no uncertain terms: "Black is the most aristocratic color of all. There is no color that will give you the feeling of totality. Of peace. Of greatness. Of quietness. Of excitement. I have *seen things* that were transformed into black, that took on just greatness. I don't know a lesser word."[1] The black has been described by the Louise Nevelson Foundation as very matte and very jet-black with no reflection.[2] Tony Smith described his objects as "voids" and said of them, "they are black and probably malignant."[3] The Tony Smith Estate defined the intended appearance of the black he used as a "dull semi-gloss"[4] and emphasized that for Smith the hue of the black (e.g., cool or warm) was not as critical as the gloss level. Alexander Calder consistently specified low gloss coatings for both his indoor and his outdoor sculptures and referred to his outdoor sculptures as his "dreadnoughts," after the imposing class of battleships from the early twentieth century.[5] Beyond just his personal preference, the Calder Foundation has described the artist's interest as seeing the form of the sculpture rather than being distracted by a surface reflection.[6]

Having input from artists' estates, foundations, and studios, as well as from conservators and paint applicators, in the early stages while paint formulation is being developed is a unique opportunity. It means not only that appearances can be tailored, but also that other properties, such as viscosity and drying time, can be adjusted. The next step will be large-scale tests for paint applicators, followed by pilot applications to select sculptures, in collaboration with the relevant foundations and estates. The commercial availability of these paints will be ensured through partnerships among the GCI, the ARL, and commercial paint manufacturers with a long history of collaboration with the ARL. In the long term, the goal is to expand the color and gloss palette available to fit the requirements of other artists. This goal will be achieved by introducing different pigment packages into the new resin system and, crucially, working with an increasing number of artists' estates, foundations, and studios to provide feedback as the paints are being individually formulated to match their specified appearance. Ultimately, the hope is that more durable coatings will help sculptures maintain their appearance longer and ensure that the dialogue between the sculpture and the spectator continues.

Maria Nevelson and Joyce Pomeroy Schwartz evaluating different black paint samples to re-create the correct look for Louise Nevelson's outdoor painted sculpture. Artwork: © 2016 Estate of Louise Nevelson/Artists Rights Society (ARS), New York. Photo: Abigail Mack.

Abigail Mack, an independent conservator, and John Escarsega, who is with the Army Research Laboratory, are team members of the GCI's Outdoor Sculpture project. Rachel Rivenc is a GCI associate scientist and the project's leader.

1. Louise Nevelson, *Dawns and Dusks: Taped Conversations with Diana MacKown* (New York: Charles Scribner's Sons, 1976), 126.
2. 2016 conversation with Maria Nevelson and Arne Glimcher regarding the parameters for appearance of Louise Nevelson's black sculptures.
3. Samuel J. Wagstaff, ed., *Tony Smith, Two Exhibitions of Sculpture*, exhibition catalogue (Hartford, Connecticut: The Atheneum, and Philadelphia: The Institute, 1966).
4. 2001 conversation with Sarah Auld, director of the Tony Smith Estate, regarding parameters for the appearance of Tony Smith's outdoor black sculptures.
5. "The Adventures of Sandy Calder," *Kansas City Star*, November 20, 1966.
6. 2015 conversation with Alexander S.C. Rower regarding the surface appearance of sculpture by Alexander Calder.

MODERN ABSTRACT ART IN ARGENTINA AND BRAZIL

BY PIA GOTTSCHALLER

FALL 2017 WILL SEE THE CULMINATION OF THE GETTY'S MULTIYEAR INITIATIVE, Pacific Standard Time: LA/LA, in which forty-six exhibitions and events on Latin American and Latino art will take place across Southern California. One of those exhibitions—*Making Art Concrete: Works from Argentina and Brazil in the Colección Patricia Phelps de Cisneros*—will open at the Getty Center itself in August 2017. This exhibition is an outgrowth of a Getty Conservation Institute (GCI) collaboration with the Getty Research Institute (GRI), which is undertaking a technical and art historical study of Argentine and Brazilian artworks loaned by the Colección Patricia Phelps de Cisneros. Thirty works from the collection will be presented in the exhibition, along with initial findings from the research, which is enlarging our understanding of techniques and materials used in these works.

The Colección Cisneros artworks date from 1946 to 1962 and are characterized by a severely reduced, geometric vocabulary. The young Latin American artists who created them called themselves "concrete," which to them meant that their compositions were rooted in reality and did not reference anything outside of themselves, such as nature. Hélio Oiticica and Lygia Clark considered themselves *Neoconcretists* and are probably the best-known artists of the group. The study also includes works by Rhod Rothfuss, Alfredo Hlito, Tomás Maldonado, Geraldo de Barros, Hermelindo Fiaminghi, Waldemar Cordeiro, Judith Lauand, and Willys de Castro.

The relative scarcity of compositional elements to distract the eye permitted the artists to lavish their attention on every little detail—the exact method used to paint a straight line, for example, or the process to achieve a perfectly homogeneous surface. The seeming simplicity of the compositions belies the artists' painstaking approach to materials and technique: the truism applies that the most simple-looking things are often the hardest to accomplish.

The opportunity to examine in depth the art production of this period presented itself when the Colección Cisneros generously agreed to lend the Getty forty-seven important and representative works for three years. Of the various categories of art in the collection, the focus of the study is on paintings and three-dimensional works because their complexities are best suited to allow comparisons between what the artists had expressed as their intent—for example, in manifestos—and what they actually achieved.

Willys de Castro (Brazil, 1926–88), *Objeto ativo (cubo vermelho/branco)*, 1962, oil on canvas on plywood, 25 x 25 x 25 cm. From the Colección Patricia Phelps de Cisneros. Photo: J. Paul Getty Museum.

MATERIALS AND TECHNIQUES

Fueled by utopian and left-wing ideas, the Argentine and Brazilian concrete artists wanted to create "nonelitist" works with universal appeal. One of their strategies was to strive for the elimination of obvious traces of their hands—in other words, their individual involvement in the process. They saw themselves as working within the continuum of modernist European and North American abstraction, but as the new Latin American avant-garde who took their predecessors' achievements to the next stage. This evolution included the adoption of a number of materials and techniques that signified their embrace of mechanical aesthetics, though with significant variation among the artists in the degree of perfection aspired to.

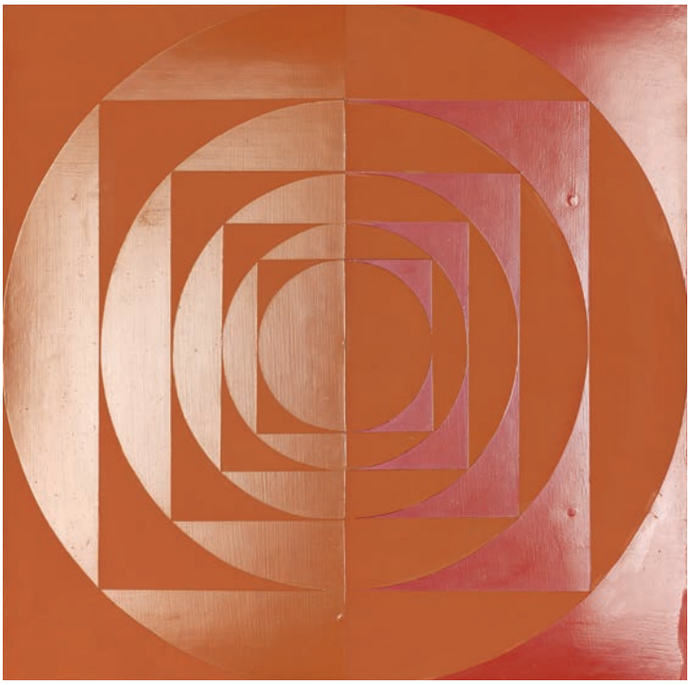
One of the earliest works is the *Marco recortado* (cutout frame), an irregularly shaped 1946 work by Juan Melé. By letting the grid structure of the composition define the outline of the work, the artist eliminated the illusion of the painting being a window into the world. Canvas would not have been a suitable support because of its texture and flexibility, and so Melé chose a rigid, smooth hardboard panel. In the United States these panels are known as Masonite, after their inventor, William H. Mason. In 1926 he patented his process, which is based on hydrolyzing wood chips, followed by pressing them into flat metal plates and/or screens (the fibers are held together by the naturally present lignin, rather than by an added adhesive). The panels have two smooth sides or one smooth and one textured canvas-imitating side. It was the perfectly napless surfaces of these panels, without canvas texture or wood grain, that made them popular with the concrete artists. Hardboard panels are also easy to cut and lightweight, and they are an inexpensive alternative to solid wooden panels. But they are prone to swelling, warping, and twisting; Melé addressed this instability by nailing wooden bars cut to size to the reverse of the panel. The bars also added some depth, protected the edges from fraying and denting, and provided a mechanism for hanging. Concrete artists in São Paulo, especially members of Grupo Ruptura, adhered deep wooden box constructions of up to seven centimeters to the reverse side to create a sense of the objects hovering in space.

Scientific analysis of the artworks included medium and pigment analysis of the paints, as well as examination of paint cross sections. Six main categories of binders, natural and synthetic, were identified: oil, oleoresin, alkyd, polyvinyl acetate (PVA), nitrocellulose, and acrylic. The presence of acrylic generally points to later overpainting and retouching (by the artists themselves or conservators). Most of the oil paint was detected in the Argentine works, but the vast majority of works were executed with industrial paints, based on nitrocellulose, oleoresin, and alkyd. These paints were formulated for indoor, outdoor, and specialized applications, such as automobile finishes, and they were chosen by the artists for very practical reasons: they are less expensive than artists' oil paints, and they dry faster to a tougher, smoother finish.

Juan Melé (Argentina, 1923–2012), *Marco recortado no. 2*, 1946, oil on hardboard, 71.1 x 50.2 x 2.5 cm. Front and back. From the Colección Patricia Phelps de Cisneros. Photo: J. Paul Getty Museum.

The Brazilian artist Hermelindo Fiaminghi, for example, exploited the fact that some manufacturers also produced alkyd paints with varying amounts of pine resin and therefore gloss, which allowed him to juxtapose very shiny red and orange shapes on top of a very matte background layer. In the mid- to late 1950s, Lygia Clark began to work with spray applications of nitrocellulose, another strategy artists adopted in their desire to create surfaces devoid of subjective handwriting. *Função diagonal* by Geraldo de Barros displays the most industrial-like, perfectly smooth finish of any of the works of this period, a feat that he achieved in part by using an unusual paint mixture—a polyurethane-modified alkyd, probably mixed for him by another Grupo Ruptura artist and friend, Kazmer Féjer, who had studied industrial chemistry and who experimented in his kitchen with plastic substances. De Barros also applied the black paint with a spray gun, and in addition hand polished the black paint areas with sandpaper. Polish marks were observed in many Argentine and Brazilian works and are remnants of an alternative strategy employed to achieve impersonal, or, as Judith Lauand put it, "depersonalized" surfaces.

By contrast, Aluísio Carvão in his neo-concretist period focused on finely nuanced color contrasts and sought ways to activate his paint surfaces—for example, by incorporating painted wooden sticks. Carvão also leached his paints by removing excess paint medium, which led to extremely dry, underbound paint layers. His homemade brushed ground and paint layers are also tightly packed with colorless, lumpy aggregates of fillers, such as gypsum, talc, silica, barite, and dolomite. Polyvinyl acetate and a mixture of alkyd and beeswax were identified in two of his works. The beeswax was probably added by Carvão to increase mattness, and although the synthetic PVA is a rarity in this study, it is commonly found in non-gloss house paints.



Hermelindo Fiaminghi (Brazil, 1920–2004), ***Seccionado no. 1***, 1958, alkyd paint on hardboard, 60 x 60 x 6 cm. From the Colección Patricia Phelps de Cisneros. Photo: J. Paul Getty Museum.

Visual examination of the works also revealed a rich array of painting techniques for the compositional elements themselves, from drawing lines freehand to using a straightedge such as a ruler or T square and self-adhesive tape. The Argentine artist Alfredo Hlito in particular excelled in the mastery of the ruling pen. Ruling pens were used throughout the twentieth century in technical drawings by architects and graphic designers, but they work best with free-flowing ink. Using this tool with oil can be challenging because the paint must be thinned to the right consistency to flow from the pen, which holds only a small amount between its metal tips. Hlito found that in creating the thinnest black lines—for example in *Ritmos cromáticos III* from 1949—sometimes a single pass was sufficient, while for the wider bars and colored rectangles, he might first draw the two outer edges of the bar or shape with the ruling pen, then fill the spaces in between with more oil paint and a brush. The exceptional technical excellence evident in the finely equilibrated compositions can be attributed to Hlito's great experience as a technical draftsman. He, like several of his colleagues, deeply admired Mondrian in these early years but was disappointed when he saw for the first time in Europe in 1953 Mondrian's pasty textures and black lines "that were like furrows."[1]

Interestingly, the Argentine concrete artists refrained from using self-adhesive tape, which was fervently embraced by many of the Brazilian artists. Judith Lauand, for instance, made frequent use of it. She, like Fiaminghi, de Barros, and Clark, preferred Scotch Tape ("Durex" in Brazil), the transparent cellophane kind that leaves a very straight paint ridge, as opposed to masking tape, which is made from crimped paper and leaves a slightly ribbed edge.

Willys de Castro, also a Neoconcretist, was known to be a perfectionist, and his personality shimmers through in everything that characterizes his *objetos ativos*, such as detailed and accurate inscriptions on the reverse of the artwork as well as a solid, neat working method. *Objeto ativo (cubo vermelho/branco)* from 1962 consists of white, preprimed canvas glued to a cube construction made from plywood and wooden corner splices. De Castro took extreme care to avoid overlap of the canvas seams at the edges of the cube: he cut a single piece of canvas the exact length of four squares, one meter, and one additional flap stacked at one end. The artist's careful brush application of the tube oil paint near the white elements parallel to their edges makes it difficult to ascertain if he used any aid. However, the fact that a few of the brushstrokes in the white squares are oriented in a right angle towards their edges suggests that he used a straightedge, and the subsequent narrowing of them by scraping away a band of two millimeters all around might have eliminated a ridge. These edges are razor-sharp—an astounding manual feat and testament to de Castro's superior craftsmanship.

EXPANDING OUR KNOWLEDGE

The GCI-GRI research on the Colección Cisneros is slated to last three years and is already providing a great amount of new information on these artists, the work of most of whom has not previously been studied from a technical point of view. A greater understanding of materials and techniques used by these artists will both increase the body of knowledge for art historians and allow conservators to devise treatments specific to artworks from this period.

On some level, a 1960 statement by de Castro applies to all of the artworks examined in this study: "The technical requirements of the lasting and clear execution of the generating idea…are what guarantee the artistic state of the work, and increasingly what prevent it from returning to the primitive brutality of the raw materials."[2] Whether they were using artists' materials or industrial products like house paints and hardboard panels, it was the artists' highly refined skills in manipulating them that resulted in some of the most important and mesmerizing artworks of the twentieth century.

Pia Gottschaller is a GCI senior research specialist.

1. Sonia Henríquez Ureña de Hlito, ed., "Biografia sincrónica de un pintor," in *Alfredo Hlito: escritos sobre arte* (Buenos Aires: Academia Nacional de Bellas Artes, 1995), 205.
2. Willys de Castro, "Objeto ativo," in Roberto Conduru, *Willys de Castro* (São Paulo: Cosac Naify, 2005), 220.

In conjunction with the GCI-GRI initiative—and with funding from the Getty Foundation—art historical and technical studies on artworks by Latin American artists of the period are underway at LACICOR, the Laboratório de Ciência da Conservação of the Universidade Federal de Minas Gerais in Brazil, and at TAREA, the Instituto de Investigaciones sobre el Patrimonio Cultural at the Universidad Nacional de San Martín in Buenos Aires, Argentina. In addition, the Museum of Fine Arts in Houston is carrying out technical studies on its own Brazilian art collection from the period.

MANUFACTURING ARTIST PAINTS

Keeping Pace with Change

BY MARK GOLDEN

"WE ARE NOT ALONE." This is not the beginning of a science fiction story, but rather a description of the very real world of manufacturing art materials. From the beginning, colormen and other manufacturers of art materials have been highly aware of the tangled web of global commerce. Medieval merchants plying their trades in ports and caravans of goods wending their way over the Silk Road set the stage for what exists today: the complex dependency of art manufacturing on larger global events and enterprises. The loss of a chemical precursor that a company in India makes, the enactment of a regulation by a health commission in Australia, or simply a marketing decision by a European pigment supplier to stop offering a specific color in response to trends in the architectural and automotive paint markets—each can force an art materials company to completely reformulate or reassess its own line. In addition, the changing landscape of business with buyouts, purchases, and mergers only serves to further uncertainty in the supply chain of materials.

In fact, there is almost nothing about materials that is solely under the control of the paint manufacturer. Everything we use to create the products artists depend on is first produced by a diverse cast of other commercial concerns with their own agendas and challenges. And the consequences of this complexity go far beyond simply what can be offered on store shelves and online. It lies at the heart of the difficulties in conducting research on and creating confidence in the materials that artists use. Experiments and testing become mere snapshots in time of a field that is constantly in motion, making lessons learned or conclusions drawn hard to build upon since the base materials themselves are so frequently subject to change. These are the realities of the environment artist paint manufacturers operate in.

THE MANUFACTURING STREAM

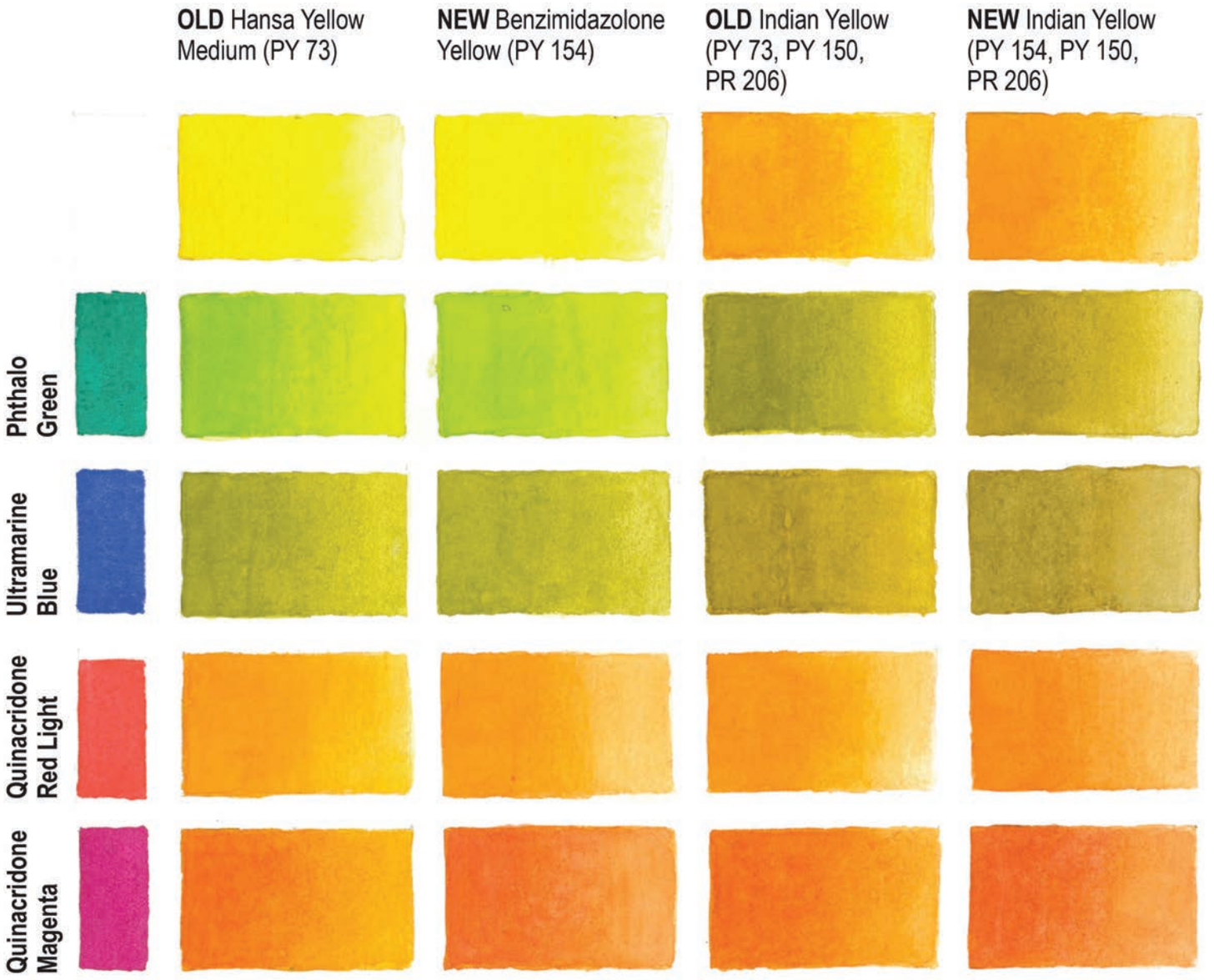
With so many potential changes in the manufacturing stream, it is important to qualify several suppliers for as many raw materials as possible (other than materials with proprietary or very special chemistries). For us, qualifying these auxiliary sources is incredibly time-consuming and resource intensive.

Resin manufacturers tend to be the most stable since changes can lead to disastrous results in product formulation. The recent purchase by Dow of the world's largest acrylic resin producer, Rohm and Haas, has been, thankfully, fairly seamless. A wholesale change in a major resin may trigger a three-year process of evaluation and testing to safely convert to its use. What is incredibly exciting, however, in the universe of binder technology is seeing the constant improvements and new formulations that allow us to investigate other possibilities, especially within acrylic and waterborne binder technology.

The stream of pigment products tends to be the most subject to change. These changes are often based on market forces. A color that is not performing well in the market for many large manufacturers is not worth the equipment or labor to produce. In other cases, the material costs of production have exceeded the market value of the product. The most recent loss of a class of pigment was Manganese Blue. The last manufacturer of the pigment quit production over ten years ago, and since then most supplies of the product have been depleted. In 2016 alone, we have already seen six pigment offerings discontinued by our suppliers.

Suppliers of pigments are not the only culprits responsible for shifts in paint formulation. We paint manufacturers also make changes through our pigment choices. Much of this work comes from our research designed to create more durable, stable, and lightfast colors. For example, in our QoR Watercolor product line we recently replaced our Hansa Yellow Medium, PY 73, with a more permanent Benzimidazolone Yellow, PY 154. This was an instance of choosing slightly less chroma to achieve greater permanency. In this case, a pigment that tested as lightfast ten years ago failed to meet standards in recent repeat testing. This was an unexpected occurrence, but it demonstrated that even within the same pigment chemistry, a change in production, such as the creation of a different size particle or an alteration in surface treatment, may have occurred without the manufacturer informing us of the change.

Keeping up with regulatory changes in a global market is also a significant driver of change in formulas and the selection of raw materials. A recent example of a proposed sweeping change that was being considered by the European Chemicals Agency was a suggested ban of cadmium-containing pigments. The ban was averted only by a strong response from the arts community and an improved understanding of the real environmental dangers posed by these materials, which were much less than anticipated and ultimately deemed insignificant. But as our awareness of the environmental and health effects of these materials advances, it is clear that changes will be required as we strive to improve the safety of our customers and the health of our planet. This goal can conflict with performance issues for art materials—most notably in the potential prohibition of lead white oil paint. The current conservation research suggests that in oil paint, lead white remains the most flexible paint film of any white—or, for that matter, of any other colored pigment. As white is the most frequently used paint in the majority of paintings, the potential proscription of this pigment could have significant implications for the perfor-



Older discontinued colors shown alongside their new replacements in the top row. These colors were then mixed with the colors on the left to create a few typical plans in order to show some of the differences one might see on the palette. Photo: Courtesy Golden Artist Colors, Inc.

mance of oil paintings over time. During 2015 there was quite a debate in the arts community when it was suggested that the producers of these pigments were no longer supplying product. The rumor proved false, yet it raised a significant question about the future availability of these materials.

It is a competitive global marketplace, and manufacturers are able to source materials all around the globe, with price often being the determining factor. As more manufacturing is done in Asia (and especially China), there is quite a bit less transparency from suppliers providing information about their materials. For many paint manufacturers selecting raw materials on the basis of price, purchasing from those manufacturers can be quite attractive. Thankfully, in the field of fine artist paints there are still sources producing quality materials. We are grateful that the massive automobile industry remains a valuable driver of quality. That industry, like the fine artist community, requires a high degree of lightfastness in the paints it uses.

FACTORING IN CONSERVATION

There is a reasonable desire among conservation professionals to understand all the components of works they are asked to evaluate or conserve. This remains a daunting task even during times of less change in the material components of artworks. As we venture forward into the conservation of contemporary works, we may have to reconsider how we approach this investigation.

The tools for chemical analysis are now quite powerful and within the reach of many institutions. This power may give us a sense that we can be even more precise in our investigation of the conservation of a work. In part to benefit the conservation community, our company has retained samples of all our products from almost every stage of operation since our inception. Even so, it is still difficult to use these samples as research resources to confirm what batch, from what year, or even the exact product an artist may have used. Although we are just beginning to understand current paint formulations and their impact on conserving work,

A drawdown pigment comparison. The Arylide Yellow pigment (PY 65) on top is being discontinued by the manufacturer. All the replacement PY 65 pigments differ significantly in mass tone. Photo: Courtesy Golden Artist Colors, Inc.

it is important, given the rapid pace of change in all art materials from multiple sources, that we not overanalyze any specific use of a particular paint formulation to the point of losing value in our results. For example, as the investigation into cleaning acrylic paintings continues, it may not be necessary to evaluate every twist and turn in formulation but instead to concentrate on the general constituents. To understand the basic components of a paint system and how they contribute to creating a more or less permanent product may be the best we can achieve—or truly need to achieve.

Having participated in many formal and informal discussions regarding conservation, we are also aware of the issues surrounding the care and treatment of a range of artist materials we manufacture. Similar to the responsibility of preserving art in the care of conservation professionals, we at Golden Artist Colors study, research, and continue to improve our products, as it is also our responsibility to preserve for centuries to come the legacy of artists using our materials. This is not generally an easy undertaking, but it is made even more challenging by the pace of change in practice, materials, resources, environmental stewardship, and regulatory compliance throughout the world.

What we have done—and continue to do—is provide transparency to artists using our products, which entails sharing information on the factors that mandate changes in our materials. Often we have no choice in those changes, such as when favorite pigments are discontinued, as with our Quinacridone Gold, Naphthamide Maroon, and Cobalt Teal, or solids like those in our Garnet Gels. Sometimes it is information from the conservation community itself that prompts changes in our products. For example, when we began producing Williamsburg Handmade Oil Colors in 2010, initial research suggested that Zinc White was creating a brittle paint layer that might easily cleave from the surface. In almost a dozen colors (excluding Zinc White and Silver White, for obvious reasons), we reduced the zinc component to 15 percent while trying to maintain the luminosity of the color that the zinc helped create. In doing so, we also announced the changes to our customers, which was especially important to the longtime users of the paint. Not everyone was pleased with the changes, but being transparent about them has helped us continually improve our products.

The road forward is difficult. Regulatory policies, the needs of artists for stable offerings, the drive for innovation, the trends in commercial coatings and resin technology, and the concerns of conservation rarely proceed in the same direction or at the same pace. In each of these areas, we as manufacturers need to become trusted partners in crafting solutions we can all support. For conservation in particular, this will mean forging joint projects focused not simply on the past but also on becoming better predictors of the future. The creation of best practices for the understanding and conservation of what went before must be combined with the active, joint formation of a flexible and responsive set of best practices for artists engaged with the materials and needs of their own time. As stated at the outset, we are not alone. That should be clear. But a choice still remains. We can allow coexisting forces and interests to simply bump up against each other blindly as they pursue different ends, or we can acknowledge our shared interests and find areas in common where we can fashion a sense of joint advocacy and stewardship. Neither conservation professionals nor art materials manufacturers can undertake this task alone. But together we can help form a core to build from, and in so doing better serve the contemporary artist who looks to both of us for direction and clarification.

Mark Golden is the CEO and cofounder of Golden Artist Colors.

A technician measures the viscosity of oil paint on a cone–plate viscometer to assure consistency of product from batch to batch. Photo: Courtesy Golden Artist Colors, Inc.

CREATION, CONSERVATION, AND TIME A Discussion about Modern Paints

JASON MARTIN was born in Jersey, United Kingdom, and studied at the Chelsea College of Arts and Goldsmiths, University of London, in the early 1990s. His work is often monochromatic but heavily textured, where layers of oil or acrylic gel are dragged across the surface of the painting with brushes or with comb-like pieces of metal or board in one movement, often repeated many times. Martin currently lives and works in London and Lisbon.

RUTH PASTINE was born and raised in New York City and received her MFA degree from Hunter College, City University of New York. Her work in painting engages the phenomenological investigation of color, light, and matter and explores the subtle character and nuance of color and light, challenging preconceptions. Pastine questions the visual experience and redefines the perceptual field. She lives in Ojai, California.

ANALIA SABAN is a contemporary artist who received an MFA degree from UCLA. Originally from Buenos Aires, Saban often works with paint materials in nontraditional ways, such as casting objects in acrylic paint, and is known for creating paintings in which the paint is sculpted by a laser machine. She lives in Los Angeles.

They spoke with **TOM LEARNER**, head of GCI Science, and **JEFFREY LEVIN**, editor of *Conservation Perspectives, The GCI Newsletter*.

TOM LEARNER In very broad terms, could each of you talk about why you are drawn to working with paint?

RUTH PASTINE My work is focused on the phenomenological investigation of color and its optical invocation of temperature, light, and spatial interplay. My painting process explores the perceptual interaction of saturated and nuanced color relationships that investigate the dialogue between object, presence, and phenomena. Focused on the spontaneous process of painting and the methodical repetition of working serially, I work to transform the materiality of the painted surface into an optically immaterial experience. The dialectic of opposition between presence and ethereality is always in flux. My paintings explore the phenomena of color perception and color relativity.

ANALIA SABAN Paint is the question that drives my work. Paint can be a ground rock pigment mixed with oil, or synthetic paints, or all the versions of beeswax and colored pigments. There are so many definitions of what paint is. I don't really understand why we look at a painting and why that painting becomes so valuable for art history and culture, and why a monetary value is attached to a painting. I try to understand this process through the making of works.

JASON MARTIN I've always tried to find inventive strategies of making painting. I suppose the broad concept has been to explore ways of combining minimalism and expressionism. This has involved, crucially, the use of all kinds of application devices—such as brushes or cardboard or flexible pieces of metal with an edge like a comb—to move the paint around the work, and it ultimately reduces the act to a very minimal monogestural mark but also records evidence of my body within that trace. I like the nakedness of the brush mark and how that relates back to the body.

LEARNER Could you expand a little on the types of paints you use, and how that affects your working process?

MARTIN I have always been interested in exploring the inherent nature of materials. When working with oils, I often add walnut or poppy oil to loosen and speed up more strident movements. This gives me much more freedom with tracing a more infinitesimal mark. With acrylic paste, I often crop a poured edge prior to using a tool that passes through the poured mass so as to frame the concentrated area, effectively leaving the gesture benign and quoted.

SABAN Different paints lead to very different practices of painting. Just think about the variation in drying time. With oil paint, if I add a lot of paint, it might be wet for fifty to a hundred years. That versus acrylic paint, which will probably dry overnight, or encaustic paint, which will probably dry the moment it's cooled down. So the definition of paint is what really drives the work. In other instances, the media informs the idea. For example, once I built this brush out of acrylic paint. The whole brush is just acrylic paint. This is something that only acrylic allows me to do. Another thing that I can do with acrylic paint is use sculptural techniques. I am able to take a canvas all painted with acrylic and then carve it with a laser machine. Again, only acrylic paint permits me to do that.

PASTINE I'm fascinated by the materiality of oil paints—and this involves the chemistry of paint. Cadmium colors are weighted and heavy and inherently have an opacity that is very different from other saturated colors that are transparent. I utilize these differences for their essential properties. I work on paintings that are built up with countless brushstrokes and many successive layers. Each

layer is a complete layer that covers the entirety of the surface, and there is drying time in between each layer. Over the course of several months, these paintings will resolve.

JEFFREY LEVIN Do you know where you're headed when you start, or is it a very iterative process?

PASTINE I work very spontaneously and see paintings emerge. It's very physical and rigorous keeping the entirety of a surface active. There's a dynamic at play. There are predetermined color systems and defined canvas formats and sizes that I begin with, but I'm invested in the spontaneity of the process and how paintings evolve instinctually and paradoxically in opposition to these known components, which advance the work. The painting process drives the content.

MARTIN There's always an element of chance in my work, as opposed to something that's more contrived and understood. It's very much about an ephemeral moment. There's always got to be that discovery, something on the move.

LEVIN How important is the quality of the paint you use?

PASTINE Important, actually. With different brands, the saturation, density, and opacity of the pigments present new material to work with. I've found that I might have some paints remaining from a prior series, and I'll utilize them to further different charged and nuanced optical experiences in my current series. I used to believe, "Use only top-shelf," but some of the experiences that I'm looking for might be found in a less concentrated or opaque-based foundation.

SABAN I use all different paints at all different prices. Once I made a whole body of work from the color gray. I had very little money at the time and I went to a local paint factory where at the end of the year they mixed every leftover color into this gray color. You could get it super cheap, so I was able to afford a lot of paint for a lot of work. But at the same time, I had seen a show of Jasper Johns at the Met with all these gray colors, and I thought, "Now I can make my own series in grayscale." But in other cases, I do have to care more about the pigment.

MARTIN My choice of acrylic paste medium is based on its tensile quality. My chosen brand has a purity of consistency and resists shrinkage. The strength of this medium affords possibilities that allow potential casting—a process now very central to my practice. When working with oils, color choices depend on the behavior of the ground and how that ground resists or absorbs—forming a key of more or less stability. Choices regarding opacity versus transparency are dictated by the nature of the ground support and how that prepared ground supports the intended applied surface. Generally I use paints that have inherent qualities that perform well over time with their lightfast capabilities. That said, I like to disrupt more familiar approaches to advance experimental outcomes that may proffer dynamic and exciting results.

LEARNER What about the physical body or texture of some paints? How do you explore that aspect in your work?

SABAN I've explored this a lot with acrylic paint. It's important that acrylic paint is really a polymer—a plastic, as opposed to an oil paint or an encaustic paint or a watercolor. If it's basically a plastic, it should have a very plastic quality, and I can make a sculpture with it. I realized that I didn't need to paint on canvas but could make my brushstrokes on a surface like Plexiglas, from where I could peel them off, turning them into small objects or sculptures, and then glue them to a canvas. In other cases, I paint directly on canvas but on top of a layer of silicone spray so I can then peel it away from the canvas. What is interesting about this is that it takes the texture of the canvas, so you can see the brushstrokes on one side and the texture of the canvas on the other—the other side of the paint that you never see.

MARTIN The connection between painting and sculpture is interesting to me, too, and how the collision of the two creates dialogue. This has been a consistent challenge for me, exploring how these identities overlap. Can a use of paint become reduced so that it serves as a subservient application, dismissing all but a textural veneer for the sake of furthering a more fruitful enquiry as a facade to sculpture? The sculptural element in my work affords me a loose fit relationship with how I explore compositions that nevertheless relate back to the language of painting.

LEARNER Are you drawing attention to the construction of the work?

MARTIN This is a fine balancing act, as working with materials inventively often leads you down blind alleys that don't transgress anything worthwhile beyond decorative play. However, I'm not interested in a pyrotechnics of effects. The construction of form and the evident reference of the hand and body with roller or paintbrush or profile is a choice that serves to contain more a dialogue outside of effects—or what the dismissive pariahs of painting parlance condemn as "technique" and "style."

SABAN I feel there's a lot of myth around painting, and I want to uncover that myth. I want to show that the painting itself is a sculpture. We're used to seeing a painting on a wall as a two-dimensional piece, but every painting is a sculpture. It's not just the surface.

LEVIN Ruth, how engaged are you with respect to the installation of your work?

PASTINE I'm striving for an immersive experience—viscerally, physically, and perceptually—and so the installation, placement of

Ruth Pastine. Photo: Tony Pinto.

Inevitability of Truth 6–S6060 Square (Blue Orange/Blue Deep), Inevitability of Truth Series, 2015. Oil on canvas, beveled stretcher, 60 x 60 x 3 inches.

paintings in dialogue with one another, height, and lighting have a great impact on how you experience the work. What I try to impart to those who are installing the works is that you're not lighting the paintings' surfaces, you want to illuminate the room. They have their own light. As your eyes adjust to the physical presence and phenomenon of the works, they reveal and emit their inherent emergent light. I work serially, and the orchestration and dynamics between paintings of site-specific installations and my exhibitions is very important. There's a vital relationship between the work and the architectural space. I've become more strident about sharing the proper care and handling of the work towards success. My suggestions for placement of works and installing paintings at particular heights are toward ensuring that the viewer has an immersive experience. I think it's important to learn the artist's intentions when possible, and how they envision having the work experienced.

LEARNER Analia, you and I have spoken previously about the notion of time and art and how conservation responds to issues of longevity. Could you talk about that?

SABAN I think it's interesting how time is embedded into painting and art. The question of time is important because it connects with human aging and the fact that we're wet living things until we die and dry out. Paint goes through that process. When you paint, you're working with a wet medium, and then it's dry and it starts to fade. Over time, the particles start to disintegrate, and there is no way to stop that. It's the human struggle against time that is connected to painting. A piece of marble does not go through the same aging process we do. What impressed me most about the conservation lab at the GCI is the fact that it looks like a hospital lab. You use most of the same tools—from X-rays to microscopes and even to CT scans—to analyze particles of paints. Seeing all that was an exciting way to make the connection.

LEARNER Jason, do you think about how your paintings might change with time?

MARTIN Sure. Dyes fade, but the surfaces have a seal or fixative or layer that creates a barrier from the long-term punishment of daylight. The water-based mediums with a generous surface mass can shrink over a year and then will marginally change, possibly revealing fissures. For this reason, I send touch-up kits with the pigment works and care notes to resolve any intrusions. The oils oxidize over sixty years if applied in such ways and hence go through a slow structural change. The oil on occasion has been purged from the dense layer below and erupted into the surface. This has happened with some early oils that were scraped with large aluminum laser-cut profiles or combs. The paler works with a majority of white oils have in areas discolored to a yellow. However, if these zinc or titanium white oils are exposed to sunlight, they benefit from not discoloring, as these oils are photosynthetic.

LEARNER Conservators and conservation scientists are always trying to predict what might happen to works of art in the future. One way we can try to do that is to artificially speed up aging, using such things as light and temperature.

SABAN Yes, I was really excited about your experiments artificially aging modern acrylic paints. I'm excited about the GCI's aging machine, where you can take samples of paint and then over

many days simulate many years of aging. In the end, what I noticed with the human eye is that modern paints are very stable. They were completely unchanged after so many "years" of artificial aging. It was very disappointing to me that they were so stable!

PASTINE That's not disappointing to me—that's great news!

LEVIN Are you looking for your work to reflect the passage of time?

SABAN When I think about this question, I think of that perfect time when you're between twenty-five and sixty-five, when you're fully grown up and you're all together. I think my works have a lot of that quality, and contemporary works are at that point in life. They're built in a way that much of the work might disintegrate, but the main parts will remain intact. There's a structure in place to prevent the work from completely disappearing, but then there will be different parts that might shed over time.

MARTIN When I arrive at something that has a truth, and it conveys its own emotional place, I step away and think that is beyond me. It is something that I leave behind. It is a testament of my time here. I'll be gone and the work will carry on.

LEVIN Have you thought about making explicit how you want your work handled over time? How is somebody looking at your work fifty years from now going to understand what your intention was?

SABAN That's the million-dollar question. I still don't have an answer. It's hard to predict. To show a bit of aging is important. You look at the work and right away you should have a sense of its age without looking at the title on the wall. I think that's very, very important. But it's too late if half the work is in pieces on the floor. That's different. You have to interfere and stop that process. But the work has to show aging, it has to show time, because that is just embedded in the history of art.

PASTINE I've always striven to have the finished object command a certain enduring presence. Tom, you and I once had a conversation in the studio about the stability of certain paints I use. I realize now that this is an active conversation in conservation. I'm conscientious about the stability of the pigments and mediums I use towards the longevity of my work having a voice and place in history. Oil paintings have lasted for centuries, and so, with quality paints and mediums, and new formulations, and research in product development, I see this being advantageous to my work.

MARTIN I'm quite confident that my paintings will remain healthy for many years. All have care issues, however, and all works can be revitalized if necessary. They will certainly be around many years longer than I, and their vitality will hold up for generations ahead. I'm sure with my care notes the works will prevail better than traditional procedures of old that had the disadvantage of not having the insights and knowledge of modern materials and how to use them.

LEVIN Will having access to materials with long-term stability and color retention influence your choices regarding what you would utilize?

PASTINE Absolutely, because I want that presence to last. It's not just the object that engages the viewer, but the experience of that object. I've always admired Renaissance icons and illuminated manuscripts, which have lasted for centuries, and although they might not look exactly the way they did when they were made, their brilliant color and gold leaf are very much intact as presences—they're not just relics of a moment in time and history, but they engage as actual presences. I hope my work can have such longevity.

SABAN I feel a bit different. I might make a work that may not last forever, but it still could be worth making it and showing it for a certain period of time. In that case, it's like flowers—you still buy them and enjoy them even though they are not permanent. I choose to work with materials I know might not last. It's a very conscious choice I have to make—an expensive production choice, usually, as those works can't be available for sale. They stay in my collection.

MARTIN For my works, I anticipate they will remain close to the day they left the studio. The industrially fabricated supports are key to a long-term reach, as are methods employed in preparing well-adjusted grounds for destined applied mediums. I made some early errors here and there, and there are always exceptions to the rule. However, in majority, my paintings are constructed to last. Notoriously celebrated painters of the past working with diligence and responsibility were disadvantaged by limitations in the quality of the materials of their day. Time and the elements inevitably change the nature of all things, not least my works. I have endeavored to marginalize the vulnerability of my work to a minimum without sacrificing the work's inherently delicate nature.

PASTINE I agree with you with regard to the importance of process. Yes, I have become more educated about the materials I use and how these make for a more stable experience, but my process is focused on investigation and the happenstance of discovery. The work is furthered by not knowing where I'm going and by engaging and challenging limitations and parameters. The completed works are records of the energy and time that I put into them—the challenges I face, the achievements I've made, the experiences I've had. I see the work charged with those experiences.

LEARNER When things get damaged or marked, which is not part of a natural aging process, how do you deal with damage to those surfaces?

Jason Martin. Photo: Josh Wright.

Zamora, 2014. Mixed media on aluminum (Quinacridone Scarlet), 100 x 80 cm. Photo: Dave Morgan.

PASTINE When the work goes out into the world, there are variables of shipping, handling, and installation, which can pose some problems or involve accidents. Because the work has so much to do with the experience of the material, it's a problem when a mark makes a very material notation. I've been pretty successful on a few occasions in dispersing these marks by addressing them within their interior borders. Because of the seamless nature of my hand-painted surfaces, if you add anything, it looks like a stain on a greater surface, and the mark damages the experience of the continuum of the final surface. I've been successful with restoring several works, mixing paints, letting them dry, and comparing their color and quality to the area needing repair. "Less is more" is always the technique I use and recommend. But I'm not a conservator.

LEARNER Are you happy to deal with these issues yourself?

PASTINE I'm never happy to have to deal with them. On one occasion I brought in a conservator because the work was already acquired and in a permanent installation. I didn't want to risk further jeopardizing the work. I'm happy to say there have only been a few times conservation issues have been brought to my attention.

SABAN I have had major damage to a work, in which it was mishandled and dropped on the floor. The damage was so bad that I let the work die. In other instances when it was a mark, it was tough emotionally to deal with. In most cases, I don't know how to fix it. I do keep a very detailed manual of all the works—how they're made, what the structure is—and I have to refer to that manual. It's like notes on a patient that a doctor would keep.

MARTIN Damage is damage! I do sometimes touch up a problem area but in general my lack of patience prevents me from dealing with these issues. Revisiting my own work is very interesting for me. Like a diary, each work sits within a narrative and the memory of my former self at that time. The dialogues and relationships and context of my life all distilled in the brush marks before me: a record of another time. This brings nostalgia and reflection—good and bad.

PASTINE It's very distressing to get notification that a work has been damaged. It's very emotional. There was one occasion where a work of mine was damaged by a handprint, and my heart sank. They were moving the piece without wearing protective gloves, and tried to catch the painting as it was falling and left a handprint. The oils from the skin were released onto the surface of the painting. It was on the lower right-hand corner of the painting, and you could only see it at an angle if the light caught it. I recommended contacting a professional conservator, but I knew that the oils themselves were ultimately going to remain. With any work, it's difficult to go back to where you were when you made the work and be presented with the arduous task of fixing it. It's a very different process from creating the work. I'm inclined for the future to have anything that somebody wants repaired to be dealt with by conservators—because that is their focus and expertise.

SABAN And we have to support the conservation industry.

LEARNER The conservation profession still struggles with trying to figure out how best to deal with the work of living artists. What are your thoughts on that?

Analia Saban. Photo: Caren Levin.

Ultramarine Pocket Watch, 2013. Laser sculpted acrylic paint on canvas, 48 x 48 x 1 inches. Photo: Brian Forrest. Image courtesy Tanya Bonakdar Gallery.

SABAN My opinion is just one opinion. Let's say my work belongs to a public collection, and an accident happens. Maybe for me, it's really not a question. Yes, it would be nice to hear from the curators who might say, "Well, we do think that this work is worth fixing." But I feel that I'm not an authority here. It's nice to be asked—it's your work—but the work is like a child who has grown up and gone out in the world. It takes on a life of its own. I'm quite humble about it. Once it's out of my hands, it's out of my hands. But it's nice to be part of the dialogue, and maybe I can learn from it.

PASTINE In the past I wouldn't have thought to engage a conservator. It's through conversations with my galleries and having experiences with work in public collections that the conservation conversation has arisen. I'm happy to share information about a work's creation to ensure successful restoration. Conservators have the tools, processes, and techniques that I, as the maker, am not focused on, and I'm happy to have them brought in. When the work is complete and leaves the studio, it takes on a new role.

LEARNER What about this idea of the artist's intention? How easy is it to define your intention with your works, and how important should those intentions be in a conservator's decision about what should be done to your work?

MARTIN Whenever I have the opportunity, I do engage in dialogue with writers or curators. I always write statements prior to exhibitions as guides for press releases, and hopefully this allows a closer insight to my approaches and concerns. However, beyond the semantics of intellectualized critical posturing and the corrosive nature of discussion, I would never want to answer to an ideological positioning of what I do. To describe is to destroy.

PASTINE The conceptual and philosophical underpinnings of the work have spearheaded my production and direction, and they have been instrumental in guiding very different series of paintings and creating the dialectic of irreconcilable opposition that's in flux. These concepts materialized language that best represents my process and what I do spontaneously. I believe there's a reciprocal partnership in the conceptual underpinnings of the work and the making of the work, and it's important to share these ideas through talks, conversations, panel discussions, and documentation.

SABAN With some works, I might need the kind of note you put in a hospital—"DNR," which means, "Do not resuscitate." That's how I see it. There is a difference between the work getting, say, a bit of mold and then getting repaired because that is treatable, and a situation requiring real resuscitation of the work. I'm talking about where you really are putting the work on a respirator and maybe remaking it, or having it redone in a way that is clearly artificial, that doesn't show the work's age, and that doesn't show the work's personality. It's kind of a ghost of the work. That's something I think about in my own person. It's like plastic surgery. I'll see once I get to that older age whether I would do it or not. But my perspective right now is that I'm not into it, and I do not want to apply that to my work. Your own philosophy of living should apply. The work should show its age and history, and if the work is really damaged, it should die. But if it has a slight issue that can easily be fixed, then it should be fixed. And that's why I do support conservation practices.

KEY RESOURCES **CONSERVING MODERN PAINTS**

For links to the online resources listed below, please visit http://bit.ly/keyresources_31_2

ONLINE RESOURCES, ORGANIZATIONS & NETWORKS

American Society for Testing and Materials (ASTM) International
An international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.
- Committee D01 on Paint and Related Coatings, Materials, and Applications
- Subcommittee D01.57 on Artist Paints and Related Materials

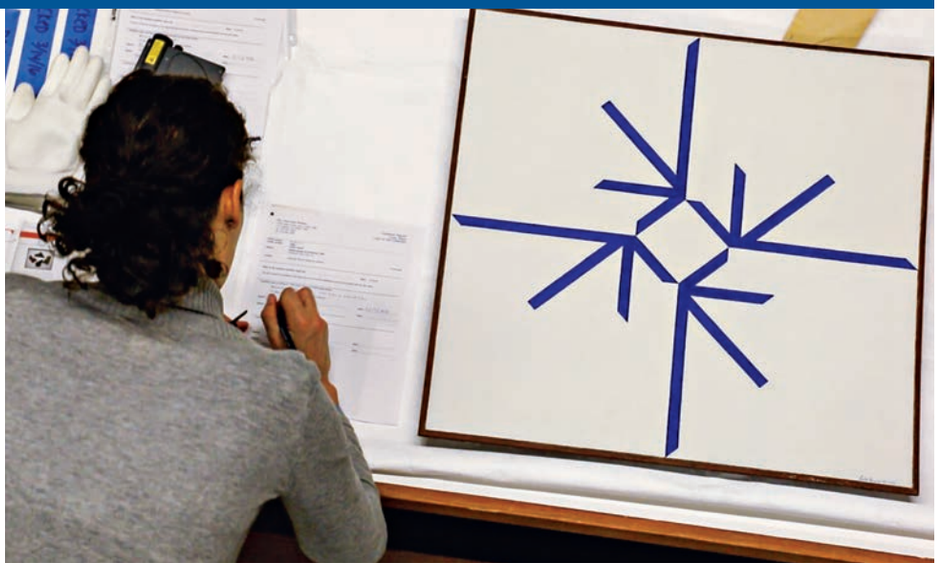
The Art in Architecture/Fine Arts Division, GSA
Commissions American artists to create publicly scaled and permanently installed artworks for federal buildings nationwide and is responsible for their care and maintenance.

The Getty Conservation Institute Website
The Modern and Contemporary Art Research Initiative website has information about its projects, including the Modern Paints project; see also the Cleaning of Acrylic Painted Surfaces (CAPS) workshops.
- Modern and Contemporary Art Research Initiative
- Cleaning of Acrylic Painted Surfaces (CAPS) workshops

International Network for the Conservation of Contemporary Art (INCCA)
A platform for information exchange on all aspects of the conservation of contemporary cultural heritage, including plastics.

Modern Materials and Contemporary Art (MMCA) and Paintings working groups of ICOM-CC
Working groups of the International Council of Museums; the first promotes and facilitates the dissemination of research and discussion on the conservation of modern and contemporary art; the second encompasses areas of research that contribute to the understanding of the materiality and making of paintings and that facilitate their conservation and presentation.

Modern Oils Research Consortium (MORC)
International research consortium established to facilitate information exchange about research into modern oil paints.



Artwork: Judith Lauand, *Quatro grupos de elementos*, 1959. © 2016 Artists Rights Society (ARS), New York /AUTVIS, São Paulo. From the Colección Patricia Phelps de Cisneros. Photo: Jeffrey Levin, GCI.

BOOKS, JOURNALS & CONFERENCES

Analysis of Modern Paints by Thomas J. S. Learner (2005), Los Angeles: Getty Publications.

The Conservation of Twentieth-Century Outdoor Painted Sculpture: Meeting Report by Tom Learner and Rachel Rivenc (2015), Los Angeles: Getty Conservation Institute.

Conserving Outdoor Painted Sculpture, edited by Lydia Beerkens and Tom Learner (2014), Los Angeles: Getty Conservation Institute.

A Constructive Vision: Latin American Abstract Art from the Colección Patricia Phelps de Cisneros by James B. Cuno, John Elderfield, Ariel Jiménez, and Colección Patricia Phelps de Cisneros (2010), New York: Fundación Cisneros.

The GCI's Artist's Materials Series, published by Getty Publications, Los Angeles:
Willem de Kooning: The Artist's Materials by Susan F. Lake (2010).
Jean Paul Riopelle: The Artist's Materials by Marie-Claude Corbeil, Kate Helwig, and Jennifer Poulin (2011).
Lucio Fontana: The Artist's Materials by Pia Gottschaller (2012).
Hans Hofmann: The Artist's Materials by Dawn V. Rogala (2016).

The Impact of Modern Paints by Jo Crook and Tom Learner (2000), New York: Watson-Guptill.

Issues in Contemporary Oil Paint, edited by A. Burnstock, M. de Keijzer, J. Krueger, T. Learner, A. de Tagle, and G. Heydenreich (2014), New York: Springer.

Just Paint newsletter, published by Golden Artist Colors, Inc., New Berlin, New York.

Modern Paints Uncovered: Proceedings from the Modern Paints Uncovered Symposium, May 16–19, 2006, Tate Modern, London, edited by Thomas J. S. Learner, Patricia Smithen, Jay W. Krueger, and Michael R. Schilling (2008), Los Angeles: Getty Publications.

GCI VIDEOS

Cleaning of Acrylic Painted Surfaces (CAPS) workshop videos

Conservation of Modern Paints

Exploring and Conserving Jackson Pollock's Mural

Outdoor Painted Sculpture

For more information on issues related to conserving modern paints, search **AATA Online** at **aata.getty.edu/home/**

Tribute

Photo: Scott S. Warren, for the GCI.

SHIN MAEKAWA
1952–2016

Shin Maekawa—a long-serving member of the GCI staff (1989–2016) and an integral part of the Institute's work from its early days—passed away on July 21, 2016, after quietly enduring an extended illness.

A native of Japan, Shin came to California for his university studies. After receiving a master's degree in mechanical engineering from UCLA, he worked for over a decade as an engineer for an American defense company. In 1989, wanting a change, Shin left a promising career in defense to join the scientific staff of the GCI. He would spend the rest of his life engaged in conservation.

The breadth of Shin's efforts at the Institute was considerable, as was the international character of the diverse work he undertook. From Egypt, to Honduras, to China, to Italy, to Brazil, Shin carried out a variety of projects. Early endeavors included the development of environmental monitoring stations designed to collect data that could aid in a heritage site's conservation—stations that he continued to refine throughout his career. Early on he also engaged in nitrogen anoxia research, leading to the development of oxygen-free museum display cases that he first designed for use with the mummy collection in the Egyptian Museum in Cairo, and later for the Constitution of India documents in New Delhi.

Shin went on to spearhead research into collections in hot and humid environments, focusing on the development of economical and sustainable strategies to reduce biodeterioration of collections housed in historic buildings in hot and humid regions. This led to a significant follow-up project on alternative climate controls for historic buildings, applying the techniques he had previously developed. All this work culminated in the 2015 publication *Environmental Management for Collections: Alternative Conservation Strategies for Hot and Humid Climates*, which he coauthored. The book received the American Publishers 2016 PROSE Award for Environmental Science.

Shin's work in the last few years of his life was emblematic of his career, in which his extensive expertise was applied in a variety of sites. He conducted environmental work at the tomb of Tutankhamen in Egypt, at Herculaneum in Italy, at the Qianlong Garden in the Forbidden City in Beijing, and at the iconic midcentury Eames House in Los Angeles.

In the midst of his professional tasks, Shin furthered his own education, earning a PhD in conservation science from Tokyo University of the Arts in 2004. His hope, upon retirement from the GCI, was to teach.

Shin quietly took great pride in his work, telling colleagues that he was glad to be contributing to things in which he deeply believed. Indeed, his consistent dedication, quest for excellence, scientific creativity, and wry sense of humor were his hallmarks, characteristics greatly valued by the many conservation professionals who worked with Shin over a quarter of a century. His loss cuts deeply both professionally and personally. We offer our condolences to his wife Kayoko, his children David and Mika, and the rest of his family as we mourn the passing of one of our own.

GCI News

Project Updates

HERCULANEUM

In May 2016 Phase I of the collaborative GCI project to conserve the decorated architectural surfaces in the tablinum of the Casa del Bicentenario at Herculaneum was completed. This work included stabilizing the wall paintings—injection grouting detached plaster, consolidating powdering pigment, and readhering flaking paint—as well as removing cement fills applied in previous interventions, which were damaging the surrounding original Roman plaster.

Along with the wall paintings stabilization, the first phase of environmental monitoring was completed and data were synthesized on the environment in, on, and around the wall paintings in the interior and exterior of the room. Diagnostic investigations have provided interesting and pertinent results related to the original painting and plastering techniques, deterioration products, and materials used in recent interventions. A condition survey in graphic, photographic, and written form was also undertaken.

Information from the project components is being compiled and analyzed to better understand the original execution technique of these exquisite wall paintings, the deterioration agents and mechanisms, and the previous interventions, including the excavation and restoration of the room in the early twentieth century. The aim is to develop passive measures and remedial treatments based on a methodological approach to conservation that can be applied to sites exhibiting similar issues.

Following structural stabilization of the Casa del Bicentenario by the Soprintendenza Pompeii in collaboration with the Herculaneum Conservation Project, the GCI project team will complete conservation treatment and implement passive measures to mitigate fluctuations of temperature, humidity, and solar radiation on the wall paintings. As a final component of the project, the mosaic pavement will be conserved.

Members of the GCI project team carrying out monitoring and reattachment of flaking paint in the tablinum of the Casa del Bicentenario at Herculaneum. Photo: Francesca Piqué, for the GCI.

CONSERVATION PLANNING AND CONCRETE CONSERVATION WORKSHOPS HELD

In late July, the GCI with the Getty Foundation and the United Kingdom–based Twentieth Century Society held two workshops in London for grantees of the Foundation's Keeping It Modern initiative, which is dedicated to the conservation of twentieth-century architecture around the world. The workshops—supported with a Getty Foundation grant to the Twentieth Century Society—brought together owners and professionals currently working on projects exemplifying a range of conservation challenges of twentieth-century built heritage to exchange knowledge and learn new skills.

The first workshop, on conservation management plans, involved more than thirty participants and fifteen outstanding works of modern architecture, including the recently listed World Heritage Site, L'appartement-atelier de Le Corbusier in Paris; Pierre Jeanneret's Gandhi Bhawan building in Chandigarh, India; the Salk Institute for Biological Studies in La Jolla, California; and the Arthur Neiva Pavilion in Rio de Janeiro, Brazil. While conservation management plans are a fundamental tool in conservation practice, they have not been universally applied to modern heritage. The workshop provided the opportunity for practitioners to discuss a range of challenges specific to modern heritage, establish a network of colleagues, exchange ideas, and expand their understanding of this important methodology. The workshop included site visits to the National Theatre and the Barbican Centre and the opportunity to meet British colleagues engaged in this area of work.

The second workshop, which convened some ten projects dedicated to the conservation of concrete, included sites such as the

The workshop on conservation management, held in London for grantees of the Getty Foundation's Keeping It Modern initiative. Photo: Sara Lardinois, GCI.

Sydney Opera House, the Miami Marine Stadium, Frank Lloyd Wright's Unity Temple, and Charles Rennie Mackintosh's Hill House in Scotland. Given the growing number of listed concrete buildings and their conservation challenges, this subject is of increasing importance to the field. Participants shared information on diagnostic and investigative tools and methods, and colleagues from Historic England and the Laboratoire de Recherche des Monuments Historiques in France presented their advisory and research work. A number of site visits to recent concrete conservation projects provided an opportunity for participants to observe recent approaches in this challenging area of conservation.

A panel at the "Keep It Moving? Conserving Kinetic Art" conference, held at the Palazzo Reale in Milan. Photo: Rosalia Aloguin-Dols.

Recent Events

CAPS WORKSHOP HELD

The sixth Cleaning of Acrylic Painted Surfaces (CAPS) workshop was held at the John and Mable Ringling Museum of Art in Sarasota, Florida, in July 2016. Eighteen participants attended the four-day workshop, which included lectures covering recent advances in the cleaning of acrylic painted surfaces, hands-on sessions to test cleaning materials and approaches, and group discussions about materials, techniques, applicability, and effectiveness.

The objectives of the CAPS workshops are twofold: to communicate the latest results of scientific research into the cleaning of acrylic painted surfaces, led by joint efforts from scientists and conservators at the GCI, Tate, Dow Chemical Company, and the University of Delaware; and to promulgate the consequent developments in conservation practice, stimulating an exchange between researchers and conservators and developing critical thinking skills that empower participants to design project-specific cleaning systems in their own labs. The feedback of all participants is encouraged, both to promote an open dialogue between researchers and practitioners and to efficiently answer the needs of the field.

CAPS is part of the GCI's Research into Practice Initiative, which seeks to facilitate the practical application of new research to conservation problems. Information on past workshops, as well as related materials (including videos), can be found on the GCI website.

An exercise during the CAPS workshop held at the John and Mable Ringling Museum of Art in Sarasota, Florida. Photo: Stéphanie Auffret, GCI.

KINETIC ART CONFERENCE HELD

"Keep It Moving? Conserving Kinetic Art," a three-day conference focusing on the challenges associated with the display and preservation of kinetic art, was held at the Palazzo Reale in Milan June 30–July 2, 2016, with over a hundred delegates from around the world in attendance. The conference was organized by the GCI in collaboration with the Modern Materials and Contemporary Art working group of ICOM-CC (MMCA), the Museo del Novecento, and the International Network for the Conservation of Contemporary Art. It served as the interim meeting of MMCA.

The first two days featured presentations of papers with keynotes by Reinhard Bek (Bek & Frohnert, New York) and Tiziana Caianiello (Zero foundation, Düsseldorf, Germany). Topics ranged from ethical and philosophical to technical and pragmatic issues and included obsolescence of materials, techniques, and expertise; the cost of maintaining kinetic works on display; defining what is acceptable in interpretation of the work; and preservation of function versus original materials. Questions of replicas (including artists' replicas) and exhibition copies were debated.

The final day's agenda included a visit to the kinetic collections in the Museo del Novecento and a hands-on workshop led by Attitudine Forma, the company that cares for the collection, followed by a roundtable discussion featuring Grazia Varisco, a kinetic artist prominently represented in the Novecento collection. Afternoon visits to either Fondazione Prada or the Carsten Höller exhibition at Hangar Bicocca concluded the event.

Conference proceedings will be available from Getty Publications in fall 2017.

VIDEO AVAILABLE

In conjunction with the exhibition *Cave Temples of Dunhuang: Buddhist Art on China's Silk Road*, the GCI presented a variety of public programs, including lectures, musical performances, a film screening, conversations with scholars and artists, and a residency program with musicians from the Silk Road Ensemble. Videos from a number of these events are now available on the GCI YouTube Channel.

Upcoming Events

RECENT ADVANCES IN CHARACTERIZING ASIAN LACQUER 2017

The GCI is partnering with the Cultural Heritage Agency of the Netherlands and the Rijksmuseum to offer the fourth Recent Advances in Characterizing Asian Lacquers workshop, to be hosted at Ateliergebouw, Amsterdam, May 15–19, 2017.

This five-day workshop will explore newly developed analytical procedures for acquiring detailed compositional information about Asian lacquers, their additives, and their European substitutes. During the workshop, conservators and scientists will work together in research teams to study historic lacquer samples. This is a unique opportunity for collaboration and the discussion of topics that include the compositional variation in lacquered objects made in different countries and time periods; the relevance of analytical research to conservation and interpretation; and the identification of research priorities and potential collaborations.

Workshop details and applications will be available online late fall 2016. Visit the GCI website or follow us on Facebook for further details.

SCHOLAR APPLICATIONS NOW BEING ACCEPTED

The Conservation Guest Scholar program provides an opportunity for conservators and allied professionals to pursue research that advances conservation practice and contributes new ideas to the field. Successful candidates are in residence at the Getty Center for periods of three or six months and are chosen by a professional committee through a competitive process.

Instructions, application forms, and additional information are available online in the "How to Apply" section of the Getty Foundation website. The 2017–18 Conservation Guest Scholar program application deadline is November 1, 2016.

2016–17 CONSERVATION GUEST SCHOLARS

Sanchita Balachandran
Johns Hopkins Archaeological Museum, Baltimore, Maryland. "Revealing the Practices of Ancient Athenian Painters and Potters: Preparatory Drawings and Multiple Firings."

Tami Clare
Portland State University, Oregon. "Mechanical Testing of High-Performance Nano-Composite Coatings for Outdoor Metals Conservation."

Hanna Hölling
University College London, Department of History of Art, Material Studies. "Object in Flux: Rethinking Conservation in Fluxus Artworks, Events and Ephemera."

Hossam Mahdy
Independent Scholar, Oxford, United Kingdom. "Glossary of Arabic Terms for the Conservation of Cultural Heritage."

Jongseo Park
National Research Institute of Cultural Heritage, Daejeon, South Korea. "Scientific Studies on the Deterioration Process of Asian Lacquer."

Angela Rojas
School of Architecture, Havana. "Contemporary Interventions in Historic and Traditional Contexts."

Christina Wallace
The Presidio Trust, San Francisco, California. "Architecture of the Coastal Salish Tribes of the Pacific Northwest."

POSTDOCTORAL FELLOWSHIP PROGRAM

The Postdoctoral Fellowship in Conservation Science is a two-year program designed to provide recent PhDs in chemistry and the physical sciences experience in conservation science. The 2017–19 Postdoctoral Fellow will be an integral part of GCI Science's Technical Studies research area, working closely with conservation and curatorial colleagues from across the Getty, gaining experience in cultural heritage research as conducted within a museum environment.

The fellowship runs from September 2017 to August 2019. In addition to an annual stipend, the fellow will be provided an annual study trip allowance and generous benefits, including travel to and housing in Los Angeles, as well as full health benefits.

Completed application materials must be received on or before November 15, 2016. Apply via the Getty website's "Opportunities" page; select the "Jobs" section, and enter "2016–2835" in Keywords.

GRADUATE INTERNSHIP PROGRAM

Applications are now being accepted for the 2017–18 Getty Graduate Internship program. These internships are full-time positions for students who intend to pursue careers in fields related to the visual arts. Programs and departments throughout the Getty provide training and work experience in areas such as curatorship, education, conservation, research, information management, public programs, and grant making.

The GCI pursues a range of activities dedicated to advancing conservation practice, to enhance the preservation, understanding, and interpretation of the visual arts. Twelve-month internships are available in the GCI's Collections, Buildings and Sites, and Science departments.

Instructions, application forms, and additional information are available online in the "How to Apply" section of the Getty Foundation website. For further information, contact the Getty Foundation at gradinterns@getty.edu. The application deadline is December 1, 2016.

2016–17 GRADUATE INTERNS

Nathan Daly
Columbia University, New York
Technical Studies Research Laboratory

Vincent Dion
Queen's University, Ontario, Canada
Preservation of Plastics

Federica Greco
University of Minho, Guimarães, Braga, Portugal, and the Czech Technical University, Prague
Earthen Architecture Initiative

Evan Maina Maingi
University of Evora, Portugal, in collaboration with Aristotle University of Thessaloniki, Greece, and Sapienza University of Rome, Italy
Photographic Processes Research

Sara Marandola
Sapienza University of Rome, Italy
MOSAIKON: Training for Site Managers, Mosaic Conservation Technician Training, and the Bulla Regia Model Conservation Project

Chen Yang
The Courtauld Institute of Art, University of London
Conservation and Management of the Tomb of Tutankhamen

Sarah Sojung Yoon
Columbia University, New York
Conserving Modern Architecture Initiative

Staff Update

Photo: Jeffrey Levin, GCI.

JIM DRUZIK RETIRES

In October 2016 GCI senior scientist Jim Druzik will retire, bringing to a close a career with the Institute that has spanned more than three decades.

Jim came to the GCI in 1985, the same year the Institute's first director was appointed. Prior to joining the GCI, he did a stint at the Pasadena Art Museum (now the Norton Simon Museum of Art), which was followed by a position in the paper conservation department of the Los Angeles County Museum of Art (LACMA) and then conservation research at LACMA. Prior to and during his tenure at LACMA, he also worked on his first major research project, a study with the Jet Propulsion Laboratory in Pasadena that used digital image processing to do textural analysis of paintings, drawings, and bronzes.

Jim's initial major responsibility with the GCI was to coordinate the many outside research contracts of what was then called the Scientific Program. An important collaboration for Jim in this early period was his work with the Materials Research Society. In conjunction with the society's annual conferences, he helped organize five symposia, including a stand-alone 1994 meeting in Cancun, Mexico, concentrating on the materials science aspects of conservation.

As the Institute shifted from external research contracts to an emphasis on internal research conducted in collaboration with other institutions, Jim assumed a leadership role with a number of scientific research projects, many related to preventive conservation. Among those early projects was research into the performance of pollutant adsorbents as a method of increasing the protection of objects placed in display cases or other microenvironments from air pollutants.

In recent years, Jim has managed a series of groundbreaking projects dealing with lighting and the museum environment generally. In a study that began in 2002, he was the principal investigator on microfading research, which sought to establish standard methods for carrying out microfading testing and evaluations. Shortly thereafter, he began a five-year project to develop filters for museum lighting that could reduce damage to light-sensitive objects. This was followed by a multiyear project that developed guidelines for selecting solid-state lighting for museums. Since 2012 Jim has been one of the principal investigators on a major GCI endeavor, the Managing Collection Environments initiative, which addresses a number of compelling research questions and practical issues pertaining to the control and management of collection environments in museums.

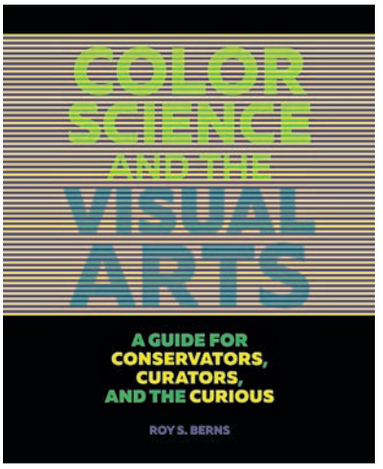
A summary of Jim's projects cannot adequately convey the important role he has played in helping shape from the very beginning the scientific work of the Institute. His clear-eyed thinking, expertise, and collegiality have been a highly valued part of the GCI's multifaceted work, and the significant research he has led has given him a deserved prominence and respect in the conservation field. Earlier this year he was awarded the Robert L. Feller Lifetime Achievement Award by the American Institute for Conservation. It will be a major adjustment for the Institute to move along without him as he heads off to a well-earned retirement.

AATA FIELD EDITORS RETIRE

After more than sixty years of combined service to *AATA Online*, long-serving field editors Barbara Appelbaum, Judith Hofenk de Graaff, and Walter Henry retired from their editorships this past spring. In their roles as field editors, they served as expert advisers in their areas of specialty—helping monitor *AATA Online*'s scope of coverage, evaluating abstracts for quality and relevance, bringing new and notable literature to light, and being ambassadors for this important resource to the field.

Their many years of participation in the editorial review process have helped *AATA Online* serve as a trusted and reliable source of information for conservators and other preservation professionals engaged in research, practice, and management. Through their involvement, they have also directly shaped the conservation profession and played critical roles in defining the field's body of knowledge—for which we, and the conservation field, are deeply grateful.

New Publications



Color Science and the Visual Arts
A Guide for Conservators, Curators, and the Curious

By Roy S. Berns

In lively and accessible prose, color science expert Roy S. Berns helps the reader understand complex color-technology concepts and offers solutions to problems that occur when art is displayed, conserved, imaged, or reproduced.

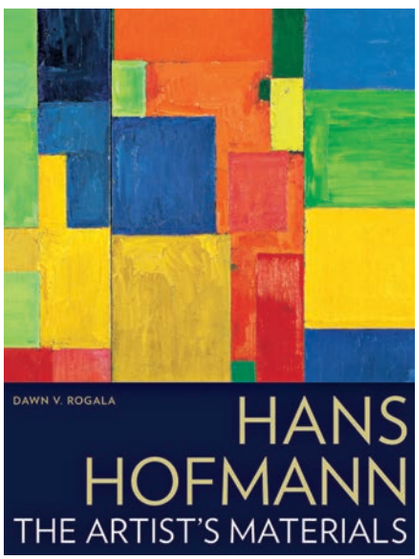
Berns writes for two audiences: museum professionals seeking explanations for common color-related issues; and students in conservation, museum studies, and art history programs. The seven chapters in the book fall naturally into two sections: fundamentals, covering topics such as spectral measurements, metamerism, and color inconstancy; and applications, where artwork display, painting materials, and color reproduction are discussed.

A unique feature of this book is the use of more than two hundred images as its main medium of communication, employing color physics, color vision, and imaging science to produce visualizations throughout the pages.

An annotated bibliography complements the main text with suggestions for further reading and more in-depth study of particular topics.

Engaging, incisive, and absolutely critical for any scholar or student interested in color science, *Color Science and the Visual Arts* is sure to become a key reference for the entire field.

Roy S. Berns is the Richard S. Hunter Professor in Color Science, Appearance, and Technology at Rochester Institute of Technology, home to the Munsell Color Science Laboratory and the only doctoral program in color science in the United States.



Hans Hofmann
The Artist's Materials

By Dawn V. Rogala

The career of the German-American painter and educator Hans Hofmann (1880–1966) follows the arc of artistic modernism from pre–World War I Munich and Paris to mid-twentieth-century Greenwich Village in New York. His career also traces the transatlantic engagement of modern painting with the materials of its own making, a relationship that is perhaps still not completely understood. In these interrelated narratives, Hofmann is a central protagonist, providing a vital link between nineteenth- and twentieth-century art practice and between European and American modernism. The remarkable vitality of his later work affords insight into not only the style but also the literal substance of this formative period of artistic and material innovation.

This richly illustrated book, the fourth in the Getty Conservation Institute's Artist's Materials series, presents a thorough examination of Hofmann's late-career materials. Initial chapters present an informative overview of Hofmann's life and work in Europe and America and discuss his crucial role in the development of Abstract Expressionism. Subsequent chapters present a detailed analysis of Hofmann's materials and techniques and explore the relationship of the artist's mature palette to shifts in the style and aging characteristics of his paintings. The book concludes with lessons for the conservation of modernist paintings generally, and particularly those that incorporate both traditional and modern paint media.

This book will be of value to conservators, art historians, conservation scientists, and general readers with an interest in modern art.

Dawn V. Rogala is a paintings conservator in the Museum Conservation Institute at the Smithsonian Institution in Suitland, Maryland.

These publications can be ordered at shop.getty.edu.

CONSERVATION PERSPECTIVES
THE GCI NEWSLETTER

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Conservation Perspectives, The GCI Newsletter is distributed free of charge twice a year to professionals in conservation and related fields and to members of the public concerned about conservation. Back issues of the newsletter, as well as additional information regarding the activities of the GCI, can be found in the Conservation section of the Getty's website, www.getty.edu/conservation.

The Getty Conservation Institute works to advance conservation practice in the visual arts, broadly interpreted to include objects, collections, architecture, and sites. It serves the conservation community through scientific research, education and training, model field projects, and the broad dissemination of the results of both its own work and the work of others in the field. In all its endeavors, the Getty Conservation Institute focuses on the creation and dissemination of knowledge that will benefit the professionals and organizations responsible for the conservation of the world's cultural heritage.

The GCI is a program of the J. Paul Getty Trust, a cultural and philanthropic institution dedicated to the presentation, conservation, and interpretation of the world's artistic legacy.

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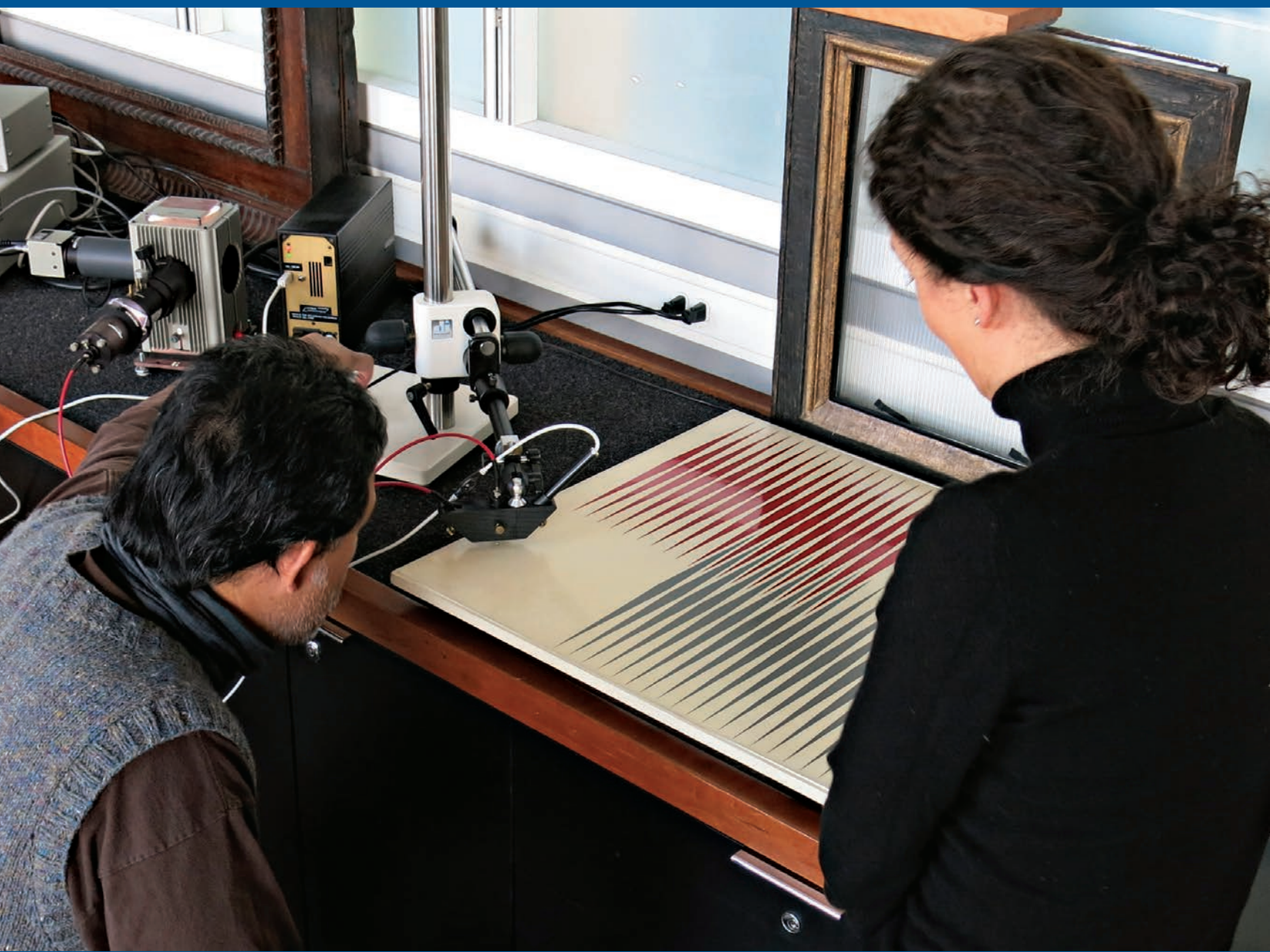

GCI staff conducting a microfading test on the white background layer of a painting by Hermelindo Fiaminghi (1920–2004), *Alternado 2*, 1957 (alkyd paint on hardboard, 61 x 61 cm). Colección Patricia Phelps de Cisneros. Photo: Devi Ormond, J. Paul Getty Museum.

The Getty Conservation Institute

www.getty.edu/conservation