



CONSERVATION
PERSPECTIVES
THE GCI NEWSLETTER

FALL 2010
DECORATED ARCHITECTURAL SURFACES



The Getty Conservation Institute

A Note from the Director



Since the publication of the previous edition of *Conservation Perspectives*, James N. Wood, the president and CEO of the J. Paul Getty Trust (of which the GCI is a part) died suddenly of natural causes. We mourn his passing.

Jim took on the leadership of the Getty in February 2007. During the time that he led the Trust, he displayed the same enthusiasm and devotion to the arts that characterized his twenty-four-year directorship of the Art Institute of Chicago. He fervently believed that the arts are critical to sustaining a civil society, and he advocated for the arts throughout his professional life. During his tenure at the Getty Trust, he also displayed great admiration for the role of conservation in the preservation of our artistic heritage—and special admiration for the multifaceted work of the GCI. On a trip to Egypt to observe the GCI’s work in the Valley of the Queens—which includes the conservation of tomb wall paintings—he expressed particular appreciation for the conservation of works of art in their full context. It is therefore fitting that we dedicate to Jim this edition of *Conservation Perspectives*, which is focused on decorated architectural surfaces.

The GCI has had a long-term commitment to the conservation of decorated architectural surfaces. Wall paintings, mosaics, textured plaster finishes, stucco, and tiles are among the many surface treatments requiring conservation that can be found in a variety of contexts, from historic and modern buildings to archaeological sites. As GCI senior project specialist and wall paintings conservator Leslie Rainer explains in her feature article, “decorated surfaces are intrinsically tied to the architectural system, inevitably suffering from deterioration factors affecting the building, monument, or site where they are located” (see p. 4). The complex relationship between material and setting poses equally complex conservation challenges—challenges that the GCI has been working to address over the years in a number of projects. Polychrome earthen bas-reliefs in Benin, mosaics in Tunisia and Israel, and wall paintings in China, Egypt, and Italy have been among the subjects of the GCI’s work, as the Institute seeks to develop and refine methods for preserving this element of our cultural heritage.

Three other articles in this newsletter offer a more detailed view of GCI work in the conservation of decorated architectural surfaces. The first of these summarizes the work of the Organic Materials in Wall Paintings project, a multiyear collaboration with several institutions in Italy that sought to develop a methodology for identifying organic materials used in wall paintings—materials that are particularly vulnerable during intervention (see p. 12). A second article describes MOSAIKON, a major new collaboration of the GCI, the Getty Foundation, ICCROM, and the International Committee for the Conservation of Mosaics that seeks to take a strategic approach to the conservation and management of archaeological mosaics in the Mediterranean region (see p. 15). The third article focuses on a current GCI partnership with Egypt’s Supreme Council of Antiquities that is undertaking the conservation and management of the tomb of Tutankhamen, including the conservation of the tomb’s wall paintings (see p. 18). Finally, three professionals whose experience with decorated architectural surfaces ranges from ancient plasters and wall paintings to modern architectural surfaces discuss some of the considerations that relate to the treatment of these elements—a provocative exploration of this especially complicated area of conservation.

Timothy P. Whalen

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THE GCI NEWSLETTER
VOLUME 25 • NUMBER 2 • FALL 2010



ON THE COVER

A view of the wall paintings scheme of the College of the Augustales at the archaeological site of Herculaneum, Italy. This site is an outstanding example of the way in which decorated surfaces can define an architectural space and contribute to the significance and value of a site. The GCI is collaborating with the Herculaneum Conservation Project to ensure the long-term preservation in situ of decorated architectural surfaces at Herculaneum. Photo: Alessandra De Vita.

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THE CONSERVATION OF DECORATED ARCHITECTURAL SURFACES

Some Perspectives

BY LESLIE RAINER

Throughout history humans have decorated the surfaces of domestic, religious, and monumental architecture. These elements have ranged from painted plasters found in the earliest human settlements to contemporary public murals, with precursors found in prehistoric rock art decorating the surfaces of caves, cliffs, and natural shelters. It is a universal human impulse to embellish the spaces where we live, work, and worship. Decorated architectural surfaces of great aesthetic, historic, and cultural value constitute a significant portion of our cultural heritage.

The term *decorated architectural surfaces* refers to an astonishing array of treatments, from wall paintings and mosaics, textured plaster finishes and scagliola, stucco and relief elements, to cast stone, tile, and terracotta facings. Materials can be manipulated to achieve a great variety of effects, making the diversity of architectural surfaces enormous. However, one thing they have in common is that they are all directly applied to the surface of a building, monument, or freestanding wall and become an integral part of the architectural system.

Decorated architectural surfaces are complex, exhibiting stratigraphies with heterogeneous materials in numerous layers, from plasters to paints and coatings and—in the case of gilding, mosaics, and other cladding—various other applied materials. Moreover, decorative schemes may be superposed, with original and subsequent historic layers covered by more recent schemes. While the most immediate perception of decorated architectural surfaces is frequently of embellishment and ornament, they can simultaneously serve as the protective skin of the underlying structure. As such, decorated surfaces are intrinsically tied to the architectural system, inevitably suffering

from deterioration factors affecting the building, monument, or site where they are located. Additionally, the larger context of the building and its surface may shift over time, and changing values may affect the significance of the decorated scheme. As the interface between the structure and its surroundings, decorated surfaces are often architectural elements of great value and, at the same time, the most vulnerable.

From mosaics and wall paintings on archaeological sites to earthen plasters on historic buildings to contemporary outdoor murals, the materials used to decorate architectural surfaces are diverse, and the contexts in which they are found vary greatly. This combination of factors presents conservators with difficult challenges. The experts needed to address conservation specialize in paintings, objects, stone, and architectural conservation, and they often require support from allied professions, including materials science, engineering, and architecture, as well as the artisan trades. The GCI has sought to address the conservation of decorated architectural surfaces over the last twenty years by carrying out research, implementing projects, and convening professionals through its field projects, scientific program, education, and dissemination.

PRESERVATION IN SITU

One of the most challenging issues in conserving decorated architectural surfaces is their preservation in situ. In the past, because of their value and significance, many architectural features were detached from their supports, as this was believed to be the best way to preserve them. Wall paintings and mosaics, in whole or in part, were routinely removed from archaeological sites to retain what archaeologists considered prized elements for study

Murals, such as *The Pope of Broadway* (Anthony Quinn) by Eloy Torrez, present particularly difficult challenges for conservators. Often these murals—made with modern paints not necessarily formulated for outdoor use, degraded by high levels of UV light, and targeted for graffiti—require maintenance and conservation treatment on a large scale. Mural: © Eloy Torrez. Photo: Leslie Rainer, GCI.



Detail of a wall painting in Cave 85 at the Mogao Grottoes, showing paint and plaster loss, flaking paint, and cracks. The deterioration in many cases is related to fluctuating environmental conditions in the cave and salt migrating through the plaster to the surface of the wall paintings. Photo: Lisa Shekede, for the GCI.

and display. However, in removing them, the elements became objects divorced from their context. Evidence of the original materials and technique of execution was often lost, as was their location and orientation on the supporting wall, vault, or ceiling. This diminished the value of the detached architectural elements, as well as the significance of the space from which they were removed. Moreover, a majority of these detached fragments ended up in storage areas inaccessible to the public.

Since the 1960s, conservation practice has advocated for the *in situ* preservation of wall paintings, plasters, and mosaics in order to retain both the integrity of the architectural ensemble and the context of the surface. In current practice, detachment of wall paintings and mosaics is commonly considered to be the very last resort when there is no alternative for their conservation *in situ*. This has created challenges to the physical preservation and maintenance of the extant surfaces and their interpretation, because of a number of factors, including environmental conditions, structural issues, and site management.

One specific challenge has been the need to reattach wall

paintings and plasters to their support. Early attempts to preserve wall paintings and plasters *in situ* used pins and anchors to hold them in place. These anchors were not only aesthetically intrusive, they also put stress on points adjacent to already detached or weakened areas, at times leading to further damage. In the 1980s scientists and conservators from ICCROM (International Centre for the Study and Preservation of Cultural Property in Rome) developed the first injection grouts to reattach wall paintings, mosaics, and plasters to their architectural supports. Over time, a variety of commercial and custom-mix injection grouts has been developed. In spite of their increased availability, there has been little systematic research into the properties and performance characteristics of injection grouts specifically for architectural surfaces.

To address this gap, GCI scientists and conservators are carrying out laboratory and field research to develop test methods for the evaluation of these injection grouts, to provide practitioners in the field with tools to make informed decisions on the use of specific grouts for different cases.

The GCI has also addressed the conservation of decorated architectural surfaces in situ in several of its field projects. One of the most complicated cases has been the conservation of wall paintings in situ at the Mogao Grottoes, a fourth- to fourteenth-century Buddhist Silk Road site near Dunhuang, China. The aim of this work, undertaken in collaboration with the Dunhuang Academy as part of a larger project on the conservation of the site, was to conserve the wall paintings in Cave 85, a representative cave temple at Mogao. The wall paintings showed a particularly complex set of conservation issues, including detachment of plasters from the substrate, damage to the paint layer by salt efflorescence, flaking paint, alteration of organic colors due to light exposure over time, and visitor impact. Conservators, conservation scientists, and engineers worked together to develop a diagnostic methodology for solving the numerous problems affecting the wall paintings and to mitigate damage to the fragile and exquisite painted earth plasters. As a result, the conservation of Cave 85 has become a model project for the conservation of other cave temples at the site and in the region.

AN INTEGRATED APPROACH

As in situ preservation has become the accepted approach for decorated architectural surfaces, the need to address issues of the surrounding site when planning for the conservation of a decorated architectural surface has become ever more evident. These architectural surfaces are affected by problems of the building or monument on which they are applied, and they can also be impacted by natural and human threats to the larger site of which they are part—a situation that requires an integrated approach to their conservation.

An example of the way in situ conservation of decorated features has led to conservation of the surrounding site can be found in the GCI's work in Egypt. In 1986 the GCI, in collaboration with the Egyptian Supreme Council of Antiquities (SCA), undertook the conservation of wall paintings in the 3,200-year-old tomb of

Queen Nefertari, wife of Ramses II. Located in the Valley of the Queens, the multichambered tomb contains a highly sophisticated wall paintings scheme. The project, comprehensive for its time, included documentation, environmental study, conservation treatment of the wall paintings, and technician training. Following the project, visitation has been restricted, and the tomb can only be visited with special permission from the SCA. Continued monitoring by the GCI has shown that the tomb is overall in stable condition, with the greatest threat coming from visitors and film crews causing unintentional damage, underscoring both the importance of monitoring and maintenance over time and the need for controlling the effect of visitors on the site.

With a larger view of site conservation issues, the GCI returned to the Valley of the Queens in 2006. In its current project, the GCI is working with the SCA to develop and implement an integrated plan for the whole valley to address the most significant threats to the site, including structural issues of the

tombs, rare but devastating flash floods, and mass tourism. While this project addresses broad site conservation issues, the heritage at the heart of the Valley of the Queens includes numerous tombs and wall paintings and plasters that risk damage and loss if larger issues are not addressed in a holistic conservation and management program.

LIVING TRADITIONS

A very different set of issues arises when considering decorated architectural surfaces on buildings still in use and for which regular maintenance and renewal are important both for the survival of the building and for the skills and traditions that created it. This is of particular concern for plasters, finishes, and paintings on earthen architecture, especially in climates where

seasons of heavy rainfall may rapidly degrade surfaces.

In some cultures, buildings may be torn down and reconstructed, and then replastered or repainted, resulting in the loss of original decorated surfaces. However, artisans trained in plas-



A rusticated sixteenth-century Italian garden grotto. Conservation of these types of decorated architectural surfaces is complex because of the diverse materials used in their construction, including shells, mosaic, calcareous rock, decorative relief plasterwork, and painted elements, and the frequent incorporation of water into their design. Photo: Leslie Rainer, GCI.

tering, painting, and finishing these surfaces ensure the survival of the tradition, though earlier schemes may be sacrificed. This cycle can pose a dilemma for conservators trained to conserve original materials.

In the late 1990s, the GCI and the Ministry of Culture and Communication in the Republic of Benin confronted the complexities of working with a living tradition in their collaborative project to conserve polychrome bas-reliefs from the *ajalala* (reception hall) of King Glélé at the Royal Palaces of Abomey. This project presented a unique example of a site with a living tradition in the care of heritage professionals trained in the conservation of material culture. When the *ajalala* was demolished in 1988 and a new one was built in its place, the bas-reliefs that had adorned the original structure's facade were detached and placed in heavy earth and cement frames, in a process that converted them from integral architectural elements to museum objects. Fifty panels from the *ajalala* were preserved as part of the museum's collection, while artisans reconstructed the building and created new bas-reliefs in their place.

Royal ceremonies are still held at the reconstructed *ajalala*, and museum visitors can view the original bas-reliefs in

an exhibit, which also provides interpretation of the history and tradition of bas-reliefs in Abomey and the conservation project. Since the project's completion, there has been greater attention to the polychrome bas-reliefs on royal and religious buildings in Abomey, and other projects have aimed to conserve historically significant buildings and treat bas-reliefs in situ. A conservation plan for the site is ensuring the preservation of the physical heritage, while artists in Benin continue to create bas-reliefs, preserving the living tradition.

Conservation professionals have begun to recognize that intangible living traditions are as valuable to preserve as physical materials. Traditions that maintain earthen finishes—such as plastering, repainting, and renewal of surfaces—are essential to the physical maintenance of these buildings and their preservation as living cultural heritage. In 2004 the GCI and the National Park Service organized an international colloquium to explore these and other issues related to the conservation and care of decorated surfaces on earthen architecture.¹ The colloquium brought together conservation professionals working in different contexts—from archaeological sites to historic buildings, living traditions, and museum settings—to start a dialogue on the range of issues faced in the conservation of diverse surface treatments on earthen architecture.

CONTEMPORARY CONCERNS

Over the last forty years, significant numbers of public murals were created by public arts programs in the United States through neighborhood beautification projects, artist commissions, and programs for youth. Exterior murals, often executed with modern paint materials not necessarily formulated for outdoor use, are showing signs of deterioration due to exposure to ultraviolet light, harsh environmental conditions, vandalism, and neglect. These contemporary examples of decorated architectural surfaces face conservation problems ranging from flaking paint, deterioration of coatings, and graffiti, to complete overpainting.

A multipronged approach is critical to link the issues of long-term care and maintenance of murals with ongoing scientific research on paint degradation and protective coatings to preserve them over time. Several institutions, including the GCI, are conducting research into modern materials,² including paint degradation, which on murals is exacerbated by exposure to ultraviolet light and atmospheric pollutants. Scientists and conservators at the GCI are also conducting research into anti-graffiti coatings to evaluate the performance of different categories of protective coatings on murals. Just as important, the GCI has worked with arts administrators responsible for public art programs to address the importance of maintenance for murals and other public art. Having a maintenance plan in



A detail of the gilded and glass tesserae of the medieval mosaic on the façade of St. Vitus Cathedral in Prague Castle. The GCI worked with Czech cultural authorities, conservators, and scientists to determine the causes of the mosaic's deterioration and to develop a conservation strategy that included conservation and restoration, application of an innovative protective coating, and implementation of a long-term monitoring and maintenance plan. Photo: Dusan Stulik, GCI.



The facade of the abandoned *ajalala* of King Huegbaja at the Royal Palaces of Abomey in 2006. Since that time the *ajalala* has been restored, and the bas-reliefs have been preserved in situ. Photo: Francesca Piqué, for the GCI.

place when new murals are created (and then carrying it out) is an effective preventive conservation measure that minimizes the need for costly, large-scale treatments.

FACING THE CHALLENGES

As illustrated in the examples mentioned here, the conservation of decorated architectural surfaces is a multidisciplinary area of conservation that draws on wide expertise. Conservators specializing in paintings, stone, and architecture must work together with architects, engineers, and scientists, combining their knowledge to address issues of both structure and surface. Furthermore, projects involving restoration may draw on skilled artists and craftspersons to re-create lost elements. The conservator of decorated architectural surfaces, who may be specialized in one or several areas of materials conservation, requires multidisciplinary training that provides a working knowledge of

the conservation issues of the entire architectural system—from the structure and substrate to the surface.

A number of organizations are working to build capacity in this area. As an adjunct to the GCI's work at the Mogao Grottoes, a degree program in wall paintings conservation was established at Lanzhou University, China, in collaboration with the Courtauld Institute of Art Conservation of Wall Painting Department (the Conservation of Wall Painting Department itself was initiated by the GCI and the Courtauld Institute of Art in 1985). MOSAIKON (see p. 15), a large-scale collaborative initiative in which the GCI is involved, is under way to address education and conservation issues of mosaics in the Mediterranean region.

The continued need for capacity building in the conservation of decorated architectural surfaces is clear. The field requires integrated training that takes into account the variety of skill sets necessary to address both surface and structure in context. Fine

arts conservation degree programs have begun to recognize the need to train conservators not only in the conservation of paintings, paper, textile, and museum objects but also in architectural surfaces. While programs in Europe have long produced wall paintings conservators, it is only more recently that some U.S. programs in art conservation and historic preservation have begun to include architectural finishes and murals in their curricula.³ However, few programs provide training in the conservation of the wide range of decorated architectural surfaces discussed here.

Conservators with such training are well positioned to communicate, to both professional colleagues and the public, the complex conservation issues of decorated architectural surfaces. By raising awareness of the significance and value of the diverse range of decorated architectural surfaces, we can ensure that increased attention and expertise will be brought to the conservation of these significant—and vulnerable—elements of built cultural heritage.

Leslie Rainer is a wall paintings conservator and senior project specialist with GCI Field Projects.

1. Colloquium on the Conservation of Decorated Earthen Architectural Surfaces, organized by the GCI and the U.S. National Park Service, September 22–25, 2004.

2. See *Conservation Perspectives: The GCI Newsletter*, vol. 24, no. 2.

3. Notably, a number of students have graduated from the Winterthur Museum/University of Delaware Program in Art Conservation (WUDPAC) with a specialized interest in the conservation of painted surfaces, including architectural finishes and murals. WUDPAC is also carrying out research on protective coatings and deterioration of acrylic paints used for murals. The graduate programs in historic preservation at Columbia University and the University of Pennsylvania both offer training in the conservation of architectural finishes.



A wall painting remnant at the Moche site of Huaca de la Luna in northern Peru. Photo: Mary Hardy, GCI.

Challenges and Advances in Training

BY ADRIAN HERITAGE

Conservation in Europe has developed from its early beginnings in fine art to cover a diversity of areas that were previously the province of craftsmen. Similarly, over the past twenty years, conservation training programs have fostered the appreciation and conservation in situ of an array of decorated architectural surfaces that were formerly neglected or otherwise damaged, whether inadvertently or intentionally as a result of shifting values.

Modern professional training programs in Europe still focus principally on mural paintings, mosaics, architectural polychromy, and gilding, but they increasingly encompass a wider variety of architectural surfaces. These range from graffiti to less exotic applications and finishes (e.g., historic tiles, plasters, renders, and screeds). This development has served to make the field ever more excitingly diverse and relevant in a twenty-first-century context.

Approaches are generally derived from conservation methodologies developed for the understanding, technical assessment, and conservation of wall paintings in situ. The integration of theory with practical hands-on training is crucial to provide familiarity with materials and techniques in context. However, escaping the classroom remains a significant logistical challenge, since curricula are loaded with modules on theory that include conservation history and ethics, natural sciences, art history, and professional skills (e.g., photography, technical English). Despite the difficulties, theory must be underpinned by direct experience with materials (how they work and don't work in practice) and by the practicalities of working on-site. The physical intimacy of students with objects is important for the contextualization of site-specific-related factors, such as building usage, ethical issues, and resource constraints. For the teaching of original materials and techniques and of conservation materials and techniques, theory should be usefully combined with workshop and laboratory work as well. Teaching in this specialty should also include preventive and passive approaches to conservation, augmented with on-site training in documentation methods and environmental assessment (including moisture surveys and environmental monitoring).

Site visits and on-site practical experience are essential course components that provide exposure to a range of architectural decoration and that complement the theoretical teaching. They promote communication among students and the various stakeholders, from professionals and specialists to owners and members of the public. By studying the function, significance, and shifting values of a site in context—as well as its material types and physical history—these projects allow idealized methodologies to be practically implemented and are, as such,



Student conservators at work in Augustusburg Castle in Brühl, Germany. The castle is an early example of eighteenth-century German Rococo architecture and is now a World Heritage site. Photo: Adrian Heritage.

invaluable training tools. Moreover, the availability and affordability of improved imaging and portable noninvasive analytical techniques—including video microscopy, multispectral and 3-D imaging, and portable analysis—are highly advantageous for student training in situ. International projects can be important, in part to attract potential conservation students but also because the ethical and cultural difficulties associated with conserving the cultural property of others raise important questions. Exposing students to diverse objects and methodologies in different contexts underpins the important lesson that no single option is right but that a number of paths can lead toward appropriate conservation. Broad experience encourages broad thinking. For example, every year students from the program at the Cologne Institute of Conservation Sciences work for two weeks at the Auschwitz-Birkenau site in Poland. Here they bear witness to the Nazi atrocities, as well as to the cynicism of the regime as expressed in the extant architectural decoration of the death camps. Beyond this, the German students have the opportunity to work together with Polish conservation students and students of other nationalities.

Current trends are such that in recent years, preventive conservation teaching has become a major component of conservation training programs in Europe. This shift toward preventive conservation was, in part, a necessary adjustment reflecting developments in museums policy and wider practice. Nevertheless, programs need to recognize the necessity to train practicing conservators and strike a balance that incorporates preventive conservation approaches along with practical skills training. More generally, the major challenge is to advance and develop academic education in conservation to the highest level,

as advocated in Europe by the European Network of Conservation-Restoration Education (ENCoRE). For example, the well-respected German diploma has largely been replaced by new BA and MA courses in the different German federal states. These courses are subject to accreditation schemes, and they use the European Credit Transference System (ECTS), intended to facilitate the comparability of academic institutions across Europe and, in theory at least, promote international mobility of students between programs. The result is a trend toward condensed courses with a proliferation of examinations. The irony is that the new structures serve to constrict student mobility, and the reduced space in the curriculum restricts the personal development and self-reflection of students.

Future challenges are to provide midcareer training for graduate conservators and the growing numbers of conservation scientists who step into the field with high academic qualifications but without formal conservation training. Their specific conservation training requirements need to be addressed. Funding shortages continue to be a major concern for training programs, and we have entered an era of increased austerity for education in general. Moreover, in view of other social priorities, spending on cultural heritage throughout Europe will very likely suffer. On the bright side, students are as keen and dedicated as ever, and as long as we can keep them close to the practice and attuned to lifelong learning, they can become and remain competent conservators.

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THE ORGANIC MATERIALS IN WALL PAINTINGS PROJECT

BY FRANCESCA PIQUÉ

THE GETTY CONSERVATION INSTITUTE'S Organic Materials in Wall Paintings project (OMWP), which began in 2003, was inspired by research undertaken at leading Italian conservation institutions, such as the Florence-based Opificio delle Pietre Dure (OPD), and by the work of well-known Italian wall paintings conservator Leonetto Tintori (1908–2000). The objective of the OMWP project has been to improve wall paintings conservation practice by enhancing the support that scientific investigations can provide by identifying organic materials in wall paintings.

Organic materials are particularly vulnerable during conservation intervention, and identifying them prior to treatment is critical. These materials deteriorate faster than inorganic components, and often only traces remain in centuries-old murals, making these organic components challenging to identify and conserve. To address this problem, the GCI partnered with scientific research groups with differing expertise on a two-phase project that first assessed a group of investigation techniques on wall paintings replica samples and then applied the results of the assessments to ongoing conservation projects (see *Conservation*, vol. 20, no. 2).

DEVELOPING A METHODOLOGY

For its assessment of investigation techniques, the OMWP project used a set of wall paintings replicas made by Leonetto Tintori in his Laboratorio per Affresco di Vainella (see *Conservation*, vol. 15, no. 3). The replicas had been prepared with different types of binders and pigments applied on lime-based plaster. Each OMWP partner laboratory evaluated the potential and limitations of one or more analytical techniques on the Tintori replicas. The partners grouped the techniques to develop an investigation methodology that started with approaches not requiring sampling (noninvasive), followed by investigations that required removal of material (invasive).

Technologies are constantly improving and—significant for the study of wall paintings—laboratory instruments are becoming portable. Portable noninvasive methods are important in the study of wall paintings (which are typically vast and heterogeneous in nature and in condition), because they allow scientists to collect a great deal of data from a large surface without

taking away any original material. In addition, when scientists are on site, direct dialogue is facilitated with the conservators regarding both selection of study area and preliminary interpretation of results. Sampling, then, can be limited to specific and characteristic situations representing many analogous areas.

THREE CASE STUDIES

In the OMWP project's second phase, three wall paintings cycles undergoing conservation were used as case studies to assess the project's methodology. This phase was done in collaboration with various sections of the Italian Ministry for Cultural Heritage.

The first case study, begun in 2005, was on the wall paintings cycle by Filippo Lippi (1406–1469) in the Cathedral of Prato (see *Conservation*, vol. 20, no. 2). The paintings, originally executed in a mixed *fresco secco* technique (very rich in organic materials applied over a fresco base), suffered from harsh and unguided cleaning interventions and heavy wax and soot deposits. As conservation intervention was already under way, only noninvasive investigative techniques were applied here. These techniques provided surface data that were difficult to interpret because of the extensive surface treatment performed on the painting in past interventions.

During work on the Lippi cycle, it became evident in discussion with head conservator Mark Gittins that the noninvasive tools had significant potential for assessing surface condition, for tracking its variation during intervention, and for post-treatment long-term monitoring. This potential was the focus of the second case study—the late-fourteenth-century wall paintings cycle *Legend of the True Cross* by Agnolo Gaddi (1350–1396) in the Alberti Chapel of the Santa Croce Church in Florence, which was the subject of a conservation program conducted by the OPD, the Opera di Santa Croce, and Kanazawa University, Japan. This large cycle, covering approximately 800 square meters (8,610 square feet) has a complex conservation history, having been previously treated several times. The OMWP project's noninvasive investigations confirmed the presence of an organic (protein-based) surface fixative (*beverone*), which was suspected by conservators. The challenge was to identify and protect the original organic material while the cleaning—aimed at removing the surface *beverone* following OPD's cleaning procedures—was undertaken.

Noninvasive measurements used on the Gaddi cycle



OMWP team members carrying out noninvasive point analysis on the Gaddi wall paintings cycle, including UV-VIS fluorescence spectroscopy measurements (foreground) and reflectance spectroscopy measurements (background). Photo: Francesca Piqué, for the GCI.

included accurate technical photographic imaging, portable fiber optic mid-FTIR reflectance spectroscopy (mid-FITR), and portable fiber optic UV-Vis fluorescence spectroscopy (FOFS). Measurements were carried out before cleaning, after water-based cleaning, and after ammonium bicarbonate cleaning of the paintings. Using mid-FITR, it was possible to follow the removal of alteration compounds such as sulfates and oxalates during cleaning and also to confirm the continued presence of proteins in specific paint layers applied *a secco*. The results were validated and compared with gas chromatography–mass spectrometry (GC-MS) characterization of the organic materials removed during cleaning and collected on cotton swabs.

This case study, carried out in collaboration with head conservator Mariarosa Lanfranchi, confirmed the capacity of noninvasive techniques in detecting changes in the composition and distribution of material on the surface of the paintings. Noninvasive methods potentially could be used not only to assess treatment but also to evaluate conditions over longer periods, thereby becoming a supporting tool for a long-term monitoring program.

The final case study was a seventeenth-century paintings cycle by Andrea Pozzo (1642–1709) in the Church of San Francis Xavier in Mondovi. Pozzo is well known not only as an artist but also for his treatise on architecture, with its appendix on how to create wall paintings. Pozzo's paintings in Mondovi are exceptional, not only for quality and beauty but also because they showed no obvious sign of previous intervention. Given the apparent authenticity of the material, these paintings provided

a rare opportunity to understand the original technique and to use this knowledge to guide the intervention and to support a minimalistic approach to conservation that was completely respectful of the original.

Cleaning the paintings proved a challenge, even though they had only a limited amount of accumulated surface dust and grime. The investigations, carried out in collaboration with head conservator Mariano Cristellotti and the supervisor for the work from the Italian Superintendence, Walter Canavesio, confirmed that although Andrea Pozzo is well known as a fresco artist, he used organic material extensively in painting this cycle—evident by the UV-induced fluorescence of some areas.

In this case, the OMWP protocols made it possible to characterize the nature of the top layer, which fluoresced strongly, suggestive of the presence of organic material. Determining if this material were original or if it were a fixative applied in the past was an important objective, especially in those areas where it had discolored and a decision needed to be made regarding its removal. Based on the results of noninvasive testing, a specific set of samples was collected that was aimed at illuminating the painting technology. In cross section it was possible to identify the presence of a thin surface layer not containing inorganic components and presumably corresponding to the surface finish visible in UV-induced fluorescence.

The type of organic material present was studied by gas chromatography–mass spectrometry and by enzyme linked immunosorbant assay (ELISA).¹ The tests identified egg white used to apply a malachite layer, while whole egg was identified in



Detail of one of the Virtues from the Pozzo cycle in visible light and in UV-induced luminescence. A strong reddish UV-induced luminescence from the shadows suggests the presence of an organic binder and/or pigment. Photos: Francesca Piqué and Frank W. Long, for the GCI.

other pigment applications. Carbohydrates have been identified in some of the transparent glazes, indicating the use of natural gums and/or organic pigments. The presence of carmic acid² suggests the use of cochineal, an organic pigment extracted from insects.

In this final case, the results of the OMWP investigations provided the professionals with scientific support in the decision on how to clean the surface. It was decided not to use reagent cleaning but, rather (and only where necessary), to use deionized water, while the majority of the surface was only dusted.

CREATING A BENEFICIAL DIALOGUE

The three OMWP project case studies are examples of in situ scientific investigation carried out according to a specific protocol. A beneficial dialogue was created among conservation professionals, an occurrence that is becoming more common thanks to the portable instruments. It is essential that scientific research be designed with the conservator and that it focus on actual conservation problems, that it is conducted with the most efficient techniques, and that its results are interpreted and evaluated by scientists along with conservators and art historians. This approach is now being applied at the Peruzzi and Bardi Chapels by Giotto in the Church of Santa Croce in Florence, in a project supported by the Getty Foundation. The project's

research program is focused on understanding the conservation problems and the materials present in preparation for possible treatment, with investigations following the protocol advocated by the OMWP project.

Despite the fact that the case studies were different in terms of the original painting technology, physical history (such as previous cleanings), conservation interventions, and deterioration caused by natural and other environmental factors, the OMWP protocol allowed the conservators to develop better treatment plans and to be more fully informed about the effects of the interventions. The experience of working with an exceptional group of collaborators and with access to so many instruments demonstrates the enormous potential of integrated research.

The ability to make sound conservation decisions requires adequate resources in terms of both time and expertise—a situation that is, unfortunately, rare. Typically, access to wall paintings is simultaneous with the beginning of the conservation interventions, and there is little time available for investigations to be conducted and results to be interpreted so as to influence decisions about interventions.

The case studies confirm, through the before- and after-treatment investigations, how sensitive wall paintings can be to any direct intervention and how difficult it is to assess what is happening. In order to improve the preservation of wall paintings, it is important to have efficient and competent teamwork, good communication, and sufficient time for investigation before making decisions on treatment—including maintaining the option not to intervene directly on the paintings.

The most important contribution of the OMWP project is related to the noninvasive investigations and the assessment of the capacity and limitation of each investigation technique tested, particularly for new portable methods such as mid-FTIR. Another valuable contribution was bringing scientists to the site to work side by side with conservators to address conservation issues. The project made abundantly clear that there are no pure frescoes as such; they were executed in mixed techniques, and organic materials were always used. None of these great painters carried out the whole scheme exclusively in *buon fresco*—they always used, in different amounts, some organic materials. Clearly, thorough study of an artwork's surface before interventions are planned is crucial.

Francesca Piqué, formerly a project specialist with the GCI, is a researcher at the University of Applied Sciences and Arts in Lugano, Switzerland, and has been the coordinator of the OMWP project.

1. Tests were conducted by Gwenaëlle Gautier and Perla Colombini at the University of Pisa, and Joy Mazurek at the Getty Conservation Institute.
2. Identified by Ana Claro a visiting postdoctoral fellow at the GCI, using high-pressure liquid chromatography.

MOSAIKON

A Strategic Regional Program for the Conservation of Mosaics in the Mediterranean



BY JEANNE MARIE TEUTONICO

THE MEDITERRANEAN BASIN is extraordinarily rich in archaeological heritage, including a vast number of mosaic pavements from classical antiquity. Representing one of the most important forms of artistic expression from the ancient world, mosaics today can be found in two distinctly different contexts: on archaeological sites or in museums. Although current conservation practice recommends that excavated mosaics remain in their archaeological context (in situ), where they can be understood as part of the site for which they were made, this was not always the case. During the nineteenth and much of the twentieth century, many archaeological mosaics were lifted from their original sites and taken to museums. Some were placed on new supports and exhibited in galleries, but thousands remain in storage.

The conservation and maintenance of this rich mosaic heritage present enormous challenges. Mosaics in situ are at risk from both natural and human factors—from exposure to the elements to looting and uncontrolled tourism. Mosaics in museums

were sometimes lifted in harmful ways or backed with materials that can ultimately be damaging. Many of those in storage are in extremely fragile condition because of unsatisfactory lifting and relaying techniques, lack of backing, poor storage conditions, and too few trained personnel to care for them.

In recent decades, there have been increased national and international efforts to create better conditions for the conservation of the Mediterranean mosaic heritage. However, in the absence of a coordinated strategic approach to the problem, needs still exceed resources, and important mosaics continue to deteriorate at a rapid rate.

MOSAIKON

To address this situation, the Getty Conservation Institute (GCI) has joined forces with the Getty Foundation, ICCROM (the International Centre for the Study of the Preservation and Restoration of Cultural Property), and the International Committee for the Conservation of Mosaics (ICCM) to create MOSAIKON, a strategic regional program for the conservation of mosaics in the Mediterranean, including both mosaics in situ and those

Above: Participants in “The Conservation and Management of Mosaics on Archaeological Sites” course assessing the condition of surviving mosaic pavements at the site of Tyre in Lebanon. Photo: Leslie Friedman, GCI.

in museum collections. Each partner organization has a long history of involvement with mosaics conservation, and each brings particular expertise and institutional capabilities to the program.

For its part, the GCI has been involved in mosaics conservation in the Mediterranean region since the 1980s, through research, training, and field activities. For the last ten years, the Institute has collaborated with the Institut National du Patrimoine (INP) in Tunisia in an ambitious training initiative to create teams of specialist technicians skilled in the conservation and maintenance of in situ mosaics. To complement this effort, the GCI has also developed training for INP site managers in the principles and methods of site conservation and management. The result is both a trained workforce in Tunisia and a sustainable training model that can be deployed in other locations.



A view of archaeological mosaics at the site of Thuburbo Maius, Tunisia, which were stabilized by technicians trained through a collaborative project of the GCI and the INP. Photo: Elsa Bourguignon, GCI.

The Getty Foundation fulfills the philanthropic mission of the J. Paul Getty Trust by supporting individuals and institutions committed to advancing the understanding and preservation of the visual arts locally and throughout the world. The Foundation, which funds initiatives that target a particular issue or region, has

chosen mosaics conservation in the Mediterranean as one of its current priorities. Over the past decade, the Foundation has supported several model mosaic conservation projects—for example, at the Basilica of Santa Maria Maggiore in Rome.

ICCROM, an intergovernmental organization headquartered in Rome, is dedicated to the conservation of cultural heritage worldwide and serves more than 125 member states. ICCROM has over fifty years of experience in training and institutional capacity building, as well as a long history of involvement with the conservation of mosaics dating to the creation of the ICCM, in 1977. It is currently involved in site management training in the Mediterranean through its ATHĀR program, which aims to protect and promote the cultural heritage of the Arab region.

Since its inception in 1977, the ICCM has grown from a small group of interested individuals to an international organization with nearly three hundred members representing over thirty countries from six continents. Through its triennial conferences and their proceedings, the ICCM has become a significant information sharing forum for conservators, archaeologists, and art historians and the main source of literature in the mosaics conservation field.

PROGRAM DEVELOPMENT

To ensure that the MOSAIKON program would correspond to local realities, a needs assessment meeting was held at ICCROM in May 2008 with representatives from twelve Mediterranean countries. Participants identified the biggest challenges facing mosaics conservation in the region and discussed what would have to change in the next decade for this precious heritage to survive. Based on recommendations from the meeting, priorities were established for the first five years of the project, and a detailed action plan was developed.

It was agreed that the initiative's first phase (2008–12) would focus on countries of the southern and eastern parts of the Mediterranean, where needs are perhaps the greatest. Emphasis in this phase will be placed on archaeological mosaics, both those in situ and those presently in museums and storage.

GOALS

The ultimate goal of the MOSAIKON initiative is improved conservation, presentation, and maintenance of Mediterranean mosaics, both those in situ and those in museums and storage. Specifically, the program seeks to: (1) strengthen the ICCM and the network of professionals concerned with the conservation, maintenance, and management of mosaics; (2) improve the knowledge and skills of technicians, conservators, and decision makers charged with caring for mosaics in situ and in museums; (3) develop locally available and affordable conservation practices for both in situ and museum conservation; and (4) promote the dissemination and exchange of information.



Mosaics on display at the Bardo Museum in Tunis, Tunisia. Photo: GCI.

ACTIVITIES

Various activities have been initiated to address these goals in ways that reflect local needs and complement other relevant regional programs.

To strengthen the professional network and information exchange, the Getty Foundation provided a grant to the ICCM to create a more robust organization that is effective in building regional networks, making available the latest information regarding best practices, and coordinating initiatives in mosaics conservation.

To improve the knowledge and skills of technicians, conservators, and decision makers charged with caring for mosaics in situ and in museums, several interrelated activities are being advanced.

- Building on the success of the GCI-INP training program in Tunisia, MOSAIKON will develop and deliver a regional training course for technicians from Tunisia, Morocco, Algeria, Libya, and Egypt. The first campaign of this course will be held in Tunisia in spring 2011, led by the GCI. Trainees will be mentored in their home countries between campaigns.
- Based on models developed by the GCI and ICCROM, MOSAIKON will deliver three subregional courses for site managers, concentrating on the conservation and management of sites with mosaics. The pilot course took place in Tyre, Lebanon, in May 2010, led by the GCI and ICCROM in partnership with the Ministry of Culture of Lebanon (see p. 28). Future courses will focus on the non-Arabic-speaking countries of the eastern Mediterranean and on the Francophone countries of the Maghreb.

- Regarding mosaics that have been removed from their original sites, MOSAIKON is developing a pilot training course for technicians responsible for the conservation and management of mosaics in museums and storage, to take place at the Archaeological Museum in Damascus. This two-year course will be led by the Centro di Conservazione Archeologica (CCA), based in Rome. Parallel to this course, the initiative will deliver a regional course for museum professionals responsible for mosaic collections. Led by ICCROM, this course will focus on larger issues of preventive conservation, condition and risk assessment, and conservation management. Both courses will begin in fall 2010 with the support of the Getty Foundation.
- Finally, in order to address a more systemic need in the region for increased numbers of conservators, MOSAIKON is undertaking a survey of university-level conservation education programs in the region, in order to determine how one or more of these programs might be developed to provide the knowledge, skills, and experience required of entry-level conservators.

To sustain these training efforts, it is essential to develop locally available and affordable practices for both in situ and museum conservation. Perhaps the greatest challenge in this regard is the need for alternative approaches to backing lifted mosaics that make use of locally available and inexpensive materials, such as lime and hydraulic lime. In consultation with mosaics conservators, the GCI has launched a research project that will examine these alternative methods and materials for backing lifted mosaics. The Getty Foundation will fund research partners in the region who will ensure that the research corresponds to local circumstances and is sustainable in the long term.

CONCLUSION

The mosaic heritage of the Mediterranean is highly significant, yet it remains under threat. By combining their expertise, organizational abilities, and financial resources, the MOSAIKON partners have taken a leadership role in bringing about the kinds of changes that will dramatically improve the conservation, presentation, and maintenance of mosaics in the Mediterranean. Through a well-articulated, strategic approach to the problem that draws upon the experience of each partner—as well as that of national governments and other entities in the region—the initiative aims to build capacity and educational infrastructure, develop sustainable solutions, and strengthen the professional network. As the initiative gains momentum and replicable models are put in place, it is hoped that other institutions will support and build upon this work, resulting in the kind of integrated activity that will ensure a better future for the exceptional mosaic heritage of the Mediterranean.

Jeanne Marie Teutonico is associate director of programs for the GCI.

IN THE TOMB OF TUTANKHAMEN

A New Conservation Effort

BY LORI WONG

SINCE THE DISCOVERY of the treasure-filled tomb of Tutankhamen by archaeologist Howard Carter in November 1922, the world has been captivated by Tut. Recent exhibits and news articles, such as those speculating on how the young king died, have continued to fuel interest around the world in King Tut and the spectacular funerary artifacts found within his tomb.

The tomb of Tutankhamen—located in the Valley of the Kings on the West Bank of Luxor and once the royal necropolis of ancient Thebes—is actually one of the smallest tombs in the valley. It is also relatively simple: only the four walls of the burial chamber are decorated with paintings. Typically, Egyptian royal tombs are complex, with multiple chambers, as well as walls and ceilings painted throughout. The texts and scenes painted in the tomb's interior were created to help the deceased king through his journey into the afterlife. The simplicity of Tut's tomb is due to his unexpected death, only a decade into his reign; Tut's sudden demise necessitated the hasty adaptation of a preexisting tomb for his interment and explains the limited painted scheme, the hurried execution of the paintings, and the tomb's unfinished chambers.

Today the tomb of Tutankhamen is one of the most popular sites on the West Bank, because of its celebrated history. It is the only tomb to have been discovered in the Valley of the Kings with its burial treasure virtually intact. Flocks of visitors descend upon it daily to view the site where Carter, having first laid eyes on the golden artifacts, famously uttered that he saw “wonderful things.” The tomb is now empty—apart from the quartzite sarcophagus (containing the gilded-wood outermost coffin) in the burial chamber and the mummy of Tutankhamen, which in 2007 was moved from the burial chamber to the antechamber for display. The extraordinary objects found by Carter were systematically removed over the course of the decade following their discovery, and they are now housed in the Egyptian Museum in Cairo.

Recently the condition of the tomb and its wall paintings has been the subject of much concern. There are fears that the high number of visitors could be contributing to the tomb's



View of the burial chamber of Tutankhamen, showing the tomb's wall paintings and the pharaoh's quartzite sarcophagus containing his gilded-wood outermost coffin. Photo: Robert Jensen, for the GCI.

physical deterioration, and worry remains regarding the disfiguring dark brown spots that mar the paintings, which were already present at the time of discovery and noted by Carter and his team. The nature and origin of these mysterious spots have never been fully ascertained, and it is not clear whether they pose a threat to the wall paintings.

In 2008 the Getty Conservation Institute entered into a five-year partnership with Egypt's Supreme Council of Antiquities (SCA) to collaborate on a project for the conservation and management of the tomb. The objectives of the project are to establish a methodological approach to conserving the tomb through investigation of the causes of deterioration, and then to design and implement a conservation program. Special attention will be placed on establishing the causes and nature of the brown spots and assessing the physical and environmental impact of visitors

on the preservation of the tomb, as well as creating guidelines for safe visitation. The project also aims to enhance the interpretation and presentation of the tomb and its contents for visitors.

The three-phased project follows a values-based conservation methodology, in which the historic and artistic values and significance of the tomb guide conservation and management decisions. The first phase (2009–10) is focused on research and assessment. So far, these efforts have included study of the literature; overall photography; investigation into the construction of the tomb and the technology of the wall paintings, sarcophagus, and coffin through visual observation and noninvasive analytical tools; condition recording; environmental monitoring; and initial analysis and diagnosis of the causes of deterioration. A program of limited sampling is planned for the fall 2010 campaign, to help identify the binding media of the paint and to carry out microbiological analysis of the brown spots, among other things. Based on the results of this first phase, the SCA and the GCI will consider needs for the tomb and together will develop a conservation plan.

The second and third phases will be conducted over a three-year period (2011–13). The second phase will focus on the implementation of the conservation plan for the tomb and its wall paintings and on the development of a program for long-term condition monitoring and maintenance. This phase will also create policies for presentation and interpretation, visitation, and other uses of the tomb; these policies will be put into practice during the third and final phase. Also as part of the final phase, the results of the project will be evaluated and disseminated to a wide professional and public audience.

Ultimately the Tutankhamen project seeks to provide a model case study that can enhance conservation practice and knowledge in the region. SCA conservators and scientists are participating in the project, and the project is providing training opportunities designed to increase conservation capacity and scientific expertise in Egypt.

The Tomb of Tutankhamen project is the GCI's most recent collaboration with the SCA in Egypt. Over twenty years ago, the Institute undertook the conservation of the wall paintings in the tomb of Queen Nefertari, the queen of the powerful ruler Ramses II. Currently the GCI is also collaborating with the SCA on the implementation of a conservation and management plan for the Valley of the Queens and on the local fabrication of GCI-designed oxygen-free display and storage cases to be installed at the Royal Mummies exhibit of the National Museum of Egyptian Civilization in Cairo.

As with the GCI's other collaborations with Egypt, the Tutankhamen project has as its focus a remarkable part of antiquity. Completed in 1323 BCE during the Eighteenth Dynasty of ancient Egypt, the tomb and its colorful wall paintings survive today in remarkably stable condition. However, the importance of this tomb—inextricably linked to its precious artifacts and the lasting fame of Tutankhamen himself—combined with the increasing pressures of tourism, warrants a comprehensive, multiyear conservation and management project to ensure the site's preservation for generations to come.

Lori Wong is a project specialist with GCI Field Projects.



A GCI team member (holding light) and SCA conservators examining the wall paintings. The participation of SCA conservators and scientists throughout the project aims to enhance conservation knowledge and practice regionally. Photo: Lori Wong, GCI.

PRESERVING IN PLACE

A Discussion about the Conservation of Decorated Architectural Surfaces

ROSA LOWINGER is director and chief conservator of Rosa Lowinger and Associates, a conservation practice specializing in twentieth-century three-dimensional art and architecture. Based in Los Angeles and in Miami, she works frequently on mosaic, terrazzo, and concrete decorative surfaces and also serves as a consultant to public art agencies and contemporary art collections throughout the United States and Latin America.

FRANK MATERO is professor of architecture and former chairman of the program in historic preservation at the University of Pennsylvania School of Design. His teaching and research focus on historic building technology and the conservation of building materials and of archaeological sites, as well as on preservation technology for traditional societies and places.

STEPHEN RICKERBY is a graduate of the Courtauld Institute's Conservation of Wall Painting Department and has worked extensively on wall paintings projects in the United Kingdom and internationally. He has been a consultant to the Getty Conservation Institute on a number of projects, including the Mogao Grottoes in Dunhuang, China. He is currently participating in projects in Egypt in the Valley of the Queens and at the tomb of Tutankhamen. He is also involved in teaching, and he co-supervises the Courtauld Institute's fieldwork sites in Cyprus, Malta, and China.

They spoke with **LESLIE RAINER**, a senior project specialist with GCI Field Projects, and with **JEFFREY LEVIN**, editor of *Conservation Perspectives*, *The GCI Newsletter*.

JEFFREY LEVIN Given that decorated architectural surfaces are a component of a larger architectural whole, how much does context dictate the course of conservation?

FRANK MATERO Context sets the stage for almost every conservation decision. Historically the issue has been whether or not certain works can exist divorced from their context. I did some research as to when the first shift occurred in thinking about retaining works of art in situ versus removing them, and I couldn't find anything specific prior to the Venice Charter of 1964, which talks about elements of sculpture, painting, and decoration not being separated from their architectural context. For some

works it's less damaging to move them out of their context than for others. Context is about relationships, and it is how we might choose to define movable from immovable, inasmuch as movable might mean works that are created regardless of context. They may have been intended for a context, but they're not physically or intentionally married to it.

ROSA LOWINGER Certain finishes don't exist outside of their context. For example, the paint surface on the walls at Mount Vernon. They don't exist apart from the walls at Mount Vernon. Not so true with mosaics. Mosaics are often removed and installed elsewhere, because they can be. But certain finishes don't have any role except to enhance the building.

STEPHEN RICKERBY I would agree with you, Frank. Context informs everything we do in conservation with regard to immovable cultural heritage. The trend to preserve in situ emerged with charters written at the time of the Venice Charter and after, but mainly in relation to architecture and archaeological remains. Wall paintings come in on the coattails of these concerns. Definitely the trend now is to preserve all site elements in situ, and in a context of preventive conservation and site management.

LESLIE RAINER How does the context inform the actual approach that you take to conserving in situ?

MATERO The question first has to be framed in terms of identifying the specific characteristics, values, and significance of the work in situ and the relationship the work has to its architectural setting. A painting can provide narrative and aesthetic enhancement, and the architecture or setting provides light, spatial qualities, and use. We have to remember the intended vantage point. Very often surfaces are painted assuming a certain perspectival relationship with the viewer. Those qualities first and foremost have to be sorted out—and when they are sorted out, you can determine what the appropriate response should be. If the answer is that the architecture does absolutely nothing—that the work was painted there for reasons that suggest it could be anywhere—then perhaps if the work is at risk from war or natural disaster or lack of protection, it could be removed. If the context really imparts a very important relationship in terms of how



Context sets the stage for almost every conservation decision.

FRANK MATERO

it would be viewed, then you have to make sure that the context is protected as much as the work.

RICKERBY Leaving aside the threat to paintings of complete destruction—the argument usually made for detachment—the notion that detachment may be permissible if the architecture is not doing anything is obviously a value judgment, isn't it? A pretty bold value judgment. And as we all know, such values shift and change over time.

MATERO Of course it's an irreversible decision. I mention it not to accept on blind faith that because something is situated where it is, that drives all other decisions. You have to go through critical judgment to identify the work in terms of its value, significance, and context, and then you make a decision. In every situation, you need to arrange in hierarchical fashion what's important. Architectural surface finishes are not all equal. And if we value one-of-a-kind artistic creativity more than something mechanically produced—even though it's a statement of its time—then many of us would not give the same value to that. Age is another one of those scales that imparts more value. I think we have to talk about surfaces that serve and surfaces that are being served. To deny that is just to say that in situ is always preferable. Yes, it is always the preferred choice, but we have a responsibility to examine all the parameters, especially in the face of risk and threat.

LOWINGER On the question of surfaces being served and surfaces that serve, if you think about it, don't *all* these surfaces serve, in a certain sense? They are served by the architecture, but what is the point of architectural surface treatments? They serve the building. They serve the context of the space. So it's an experiential thing as much as anything.

MATERO Our thinking about these surfaces partly has to go back to the role that their creators placed on them in terms of their function in that space. In the high modernism of the twentieth century, surfaces often played a secondary role in their contributions. They were clearly there to serve spatial definition. And they did it through planes of color, if present at all—very different from the kinds of articulation that the late nineteenth

century saw in the function and placement of pattern, color, and texture, and different from mural painting, the function of which was narrative. In thinking about the functionality of these things, we have to consider the intent of the time.

LEVIN Stephen, is the distinction between surfaces that serve and surfaces that are being served one that you would embrace?

RICKERBY Most of the decorated surfaces that I'm dealing with are articulating an architectural space in some form or another. In my mind, those types of paintings absolutely need to stay in their context.

MATERO One further point on the issue of in situ versus removal. Even within early conservation approaches and controversies, it is interesting to see how the perception and the arguments for intervention move through the exploration of the total work, with the image residing in the *design layer*, substrate as in *plaster*, and support as in *wall*. And you see it as you move from *strappo* to *distacco* to the entire lifting of architecture. At the site of Çatalhöyük, a very heroic and amazing transfer of earthen paintings on mudbrick walls was done in the 1960s, because the archaeologist wanted to get to the next level. The conservator could not have kept them in place because the buildings were not to be left in place—that would have thwarted archaeological research, which requires excavating through layers and time. We came along about twenty years later and faced the same conundrum, but the difference was that we said, "Let's move buildings—let's *not* remove design layers." We developed a machine to move walls to get the rooms out of the way, so the archaeologists could continue their research without compromising the painting history. At least we were there alongside our colleagues, making decisions about what to do, as opposed to being told to simply remove it.

RICKERBY But these arguments go further. As you say, our concerns for these different layers have developed from considering the surface to incorporating the plaster support and the building. We are also now concerned about intangible heritage and those types of values. Our definitions of what is of value have increased, so that we can no longer afford to pick and choose what we preserve.

LOWINGER I think we all agree that if all else were equal, we would retain murals in situ. The question is, how do we figure out what constitutes a worse threat than moving the piece out of context? Clearly war, excavation, or impending flooding due to the building of a dam constitute worse threats than removal. In the case of one of my projects, a 1940 WPA outdoor mural in the city of Inglewood, California, it was relentless tagging and neglect that spearheaded relocation. But it's appropriate to start with the idea of leaving the work in place, if it is possible.

LEVIN What are the principles that guide you in terms of conservation when you're facing a multiplicity of layers? How do you make choices about which decorative layers to preserve?

RICKERBY Ideally one is not supposed to privilege one layer over another. That's one of our conservation principles. Sometimes there are clear-cut cases, where one layer may be clearly judged more important than another, but that's a considered judgment made by a body of informed people—not just by one person in isolation. But generally speaking, we do need to strive to try to preserve all of those layers. Conservation is about allowing future options. If we take definitive steps too soon, we preclude the opportunity to make choices in the future.

MATERO I assume you mean those layers that have artistic or historic significance and merit. If we're talking about issues where each layer has an aesthetic value, then the question becomes: do you represent the work or place diachronically (through time) or synchronically (at one point in time)? Of course you want to do both, but it's not really possible. Because it's a choice from which there's no going back in terms of removal, you don't go in with prescribed notions. You have to consider each case. Often the decision ultimately rests on the user, and the conservator can simply decide to say, "No, I cannot do that because of my code of ethics and standards of practice." Or he or she can try to help find a way that is a compromise. Remember, documentation is another form of treatment. We can certainly record a layer that might be lost, for whatever reasons.

LOWINGER Stephen, you said that by choosing to be prudent, we allow for options in the future. But what could those options be? If we had the means to imagine any possible scenario, what future technique could possibly serve the needs of all those layers? It's almost like having a magic machine that could separate them out, or could allow us to see through to each layer. Doesn't it make sense to envision what the ideal thing would be?

RICKERBY Certain imaging techniques may allow us the possibility to view more than one layer, for example. But in terms of future choices, it's more the choice to have all those layers still with us, not having sacrificed one to get to the other. We may not do anything with that choice, but at least they're still there.

LOWINGER I agree. It's that dilemma of wanting to act and wanting to hold back.

RICKERBY The option to do nothing—or very little—is rarely taken. The pressure is always to achieve conspicuous results.

LOWINGER Especially when stabilization is necessary. When you have something actively deteriorating, very often the act of that stabilization makes a change that closes off an option.

RAINER Given that you're dealing with a surface in an architectural context, how do you approach the extent of treatment and make that surface legible? And are there certain times when you would do more or less reintegration?

MATERO We might begin by talking about integrity and legibility. The first order of business, as we've already discussed, is to get to the role that the surface finishes play in terms of the context and meaning, and then we will better know how to address issues related to legibility. For me, integrity has three parameters: there's material integrity, there's formal integrity, and there's functional integrity. Material is what we as conservators tend to serve, although we're also obligated to think about the larger issues of form or image, which is often where meaning resides, and context or function, which is also where meaning resides. We treat material, but ultimately we do it to address form, image, and context for meaning. The functional parameters for integrity could be social, cultural, and environmental. If you ignore the aspect of integrity that is served by the use of that image, then you're compromising its integrity. It's not just a material reality. Its integrity also resides in intangible aspects. Legibility is the ability to read literally, and for a long time conservation has privileged aesthetic quality. After all, it's often been said that aesthetics drive traditional art making. Still, we have to be mindful of other qualities when we talk about integrity and legibility.

LOWINGER When we're talking about integrity, are we referring to that of the work itself or one's experience of the work within an original context?

MATERO For me, there is the integrity within the image. There is the integrity within the scene. And there is the integrity that is the relationship between the viewer or the user and the work. That's why museum experiences, aside from the aesthetic, are so often unsatisfactory for me. All we're usually allowed to do is experience a work from an aesthetic point of view. It gets back to the first question, right? If you keep it in situ, you can have, as Stephen says, the future option of other experiences besides the aesthetic.

RICKERBY We have widely different criteria for these levels of integrity, depending on context. In an archaeological context, we're accustomed to seeing paintings in fragmented condition.



Conservation is about allowing future options. If we take definitive steps too soon, we preclude the opportunity to make choices in the future.

STEPHEN RICKERBY

Generally we don't expect them to be restored. Medieval paintings in a ruined context also fit within this romantic notion. At the same time, a medieval painting in a church that is being used may come under pressure to be restored. There's nothing objective about how these shifting criteria are exercised.

LOWINGER That's problematic in the short term, but unless we are doing something irreversible, it's not problematic over the long term.

RICKERBY It's problematic in the sense that we'll never resolve this in a satisfactory way. Someone is always going to decide at a later point that what we did in terms of "image reintegration" or "loss compensation"—our euphemisms for restoring or recreating some aspect of the painting—should have been done differently. It's also a problem in relation to the nitty-gritty of resources. We can't afford the amount of time and levels of other resources that are devoted to restoration, de-restoration, and re-restoration. Conservation, like everything else in this day and age, is about dealing with scarce resources.

MATERO Integrity, and how you address it, eventually gets you to the flip side, which is authenticity. And that, of course, is a function of how much we do to the original. The question raises two recent challenges to the assumptions that conservation has been built upon: one is the privileging of the original creative intent, and the other is the significance of subsequent interventions and changes. A related challenge is the situation where repainting by the affiliated community is considered an act of veneration. I'm sure you've faced this, Stephen. I know this comes up in Buddhist sites, for example.

RICKERBY It does in a very big way. Part of our current work in Bhutan is to study the original technology of paintings there. A big threat to those paintings is resurgent religious use and the repainting of images, much of it being funded by the West. While repainting is viewed as part of a continuing cultural tradition, what's actually happening is that the original technology is being destroyed. They are, in fact, losing an aspect of their material and aesthetic culture. Part of our work there is to highlight

these issues, which the Bhutanese are taking steps to address, although the situation remains contentious.

LEVIN All of you are talking about these matters from the standpoint of having worked in this area for quite some time. How has your thinking on these issues evolved from the beginning of your careers?

RICKERBY I had greater faith in remedial intervention. That faith has been lost—for me and, I suspect, for many others in the conservation profession. There's a global trend toward preventive conservation and site management and away from remedial intervention. While we all still practice remedial intervention, we now have doubts about its efficacy, and we place it in a context of wider conservation measures. That doesn't necessarily mean that we believe those other measures are going to save paintings. I think there is a more realistic view of what we can and cannot do. The best we can do is to slow deterioration. We've hopefully lost a lot of our hubris in terms of what we *think* we can achieve.

LOWINGER In my case, something quite different has happened. As I started working on large twentieth-century architectural surfaces, I moved into the world of treatments that are directed by architects and often implemented by contractors rather than conservators. Almost all of these interventions are remedial, and frequently the solutions are very aggressive. Sometimes my role is not fully defined, and I'm only on the job because the stakeholder—a public agency or a state historic preservation officer—has mandated the inclusion of a conservator on the team, and I'm faced with a contractor or an architect who doesn't really have much information about what our profession brings to the table. I have to begin by making the case for conservation.

MATERO In my case, certainly teaching, as much as practice, has played an incredible role in the maturity that I see myself as having acquired. Teaching is a way of continually revisiting and questioning concepts and practices that one holds fundamental. More and more I find myself telling students, "You will read this text and you will learn this method, but in terms of critically using



People are reluctant to let their works on paper or their paintings be touched by anybody but a conservator. But architecture is a total free-for-all.

ROSA LOWINGER

it, you will not understand it until years from now, when you've done it and you've applied it to many different situations. You will see that it can be completely correct in one context and completely incorrect in another." When you're young and learning the field, it seems clear-cut. I'm amazed at how much more I get by bringing experience to a text, for example. It's really remarkable. There are very good and important standards, but it's all in the application. That's why it's a critical process. That's what *critical* means. I think critical acumen only comes with maturity through experience.

LOWINGER That's true. I don't teach formally the way you do, but when I do get interns or work with new professionals, I find myself wanting to make sure that I'm thinking as clearly as possible—and that I'm imparting the contradiction that's inherent in the idea that something can be preserved. I have to market to the client that something can be preserved, but at the same time, if I've got a student or an intern there, I'm saying, "Look, we have to tell them this. None of this is untrue, but we have to spin what it is, because they want perfection." We know perfection can't happen. Somewhere in the middle is the reality.

RAINER Isn't much of teaching also about decision making? It's not just teaching students the method. It's about teaching them how to approach the decision-making process and how to understand what the options are, which comes through experience. It's not about recipes but about evaluating the needs and weighing options ahead of time when trying to come to conservation decisions. That's maybe one of the hardest things for a young professional to grasp.

MATERO In the beginning I wanted to do conservation because I was interested in applying technology to solve the problems. I understood it was a cultural process, and I understood we were preserving historic and artistic works. But it was about the quality of the technological decisions. Technology often means doing something that will serve an end that is practical. Now, after thirty years, I've tempered my enthusiasm about technology. There are many ways to address conservation issues. If you don't get the result you were hoping for—no matter what technology you throw at it—it's not correct.

RICKERBY Twenty years ago we were throwing a lot of treatment technology at wall paintings. A lot of mistakes happened as a result. As time goes on, one becomes aware that in terms of treatment, there isn't too much new we can do. Compared to the huge array of problems that wall paintings face, our remedial options are very limited. And the treatment improvements that are made are actually to address problems *we've* created—such as removing consolidants we put on ten or fifteen years ago. So we have to view progress in a very qualified way.

LOWINGER I find myself dealing with newer and more unusual materials that constantly stump me. As I deal with more and more modern buildings and more and more surfaces produced with modern materials, the types of problems increase exponentially. If you think of solving a problem as walking through a series of rooms until you get to the treasure—which is the problem's answer—it's as if there are more and more doors. I'm sometimes frustrated by technology because I find that we are better at being diagnostic than getting to results. I *do* find myself pleased with the ability to create types of compensation that work within a system. I've arrived at some comfortable decisions about how to compensate for losses in a way that produces good legibility without faking. That's the one area I feel happy about.

LEVIN Is that because you're dealing with more modern materials?

LOWINGER What I think has happened is that the conservation of twentieth-century architectural surfaces, like mosaics, glazed terracotta, and cast stone, has become something of a big business. That has led to myriad companies producing commercial materials for so-called conservation and restoration. Some of those materials, like Cathedral Stone's Jahn Mortars, are excellent and have made our work much easier. But the production of these commercial materials has also created a perception among stakeholders that there are "magic formulas" that can be applied by anybody who has taken a two-day training course.

MATERO You are finding, as is often the case in America, that you are firmly in the realm of architects, contractors, and engi-

neers in such projects. The mere fact that you're there is a miracle, because the conservator's voice is hardly ever heard. Working on things that have artistic and historic value has become profitable, and the larger construction companies that can handle the exceedingly complicated requirements placed by governments and conservation agencies have become privileged to the point that they may decide not to include a conservator. Even if they do, that conservator may have little voice at the end of the day. I don't think that as a profession, we have been diligent in our demands to have a seat at the table. I'm seeing it more and more in some projects that involve resources of very high quality related to surface finishes. It is astonishing to me that decisions are made by some contemporary architects who know nothing about conservation or preservation.

LOWINGER In California this is a big problem. There are some big firms here that market aggressively and have gotten the ear of people who make those decisions. They lobby well. And they will look you right in the eye and say, "I don't need a conservator."

MATERO With the rise of mega-firms that have taken on the entire one-stop-shop role to treat problems in a building context, decorative images have become a subject of interest, while conservators are relegated to the corner or omitted altogether. I'm not saying that artisans are not necessary in contributing to an architectural space with surface finishes. In fact, there may be whole levels of interventions that go from painting conservators to artists of traditional techniques and finishes. But I don't see those niches being appropriately staffed. There are some good firms, but without regulatory agencies and requirements, it's a free-for-all.

RAINER That's because this area, more than objects or paintings conservation, is at the interface of architecture, building contractors, and art.

LOWINGER Today people are reluctant to let their works on paper or their paintings be touched by anybody but a conservator. They're done with that. But architecture *is* a total free-for-all. It is performed by architects, engineers, and contractors, both with and without conservators on the team.

RICKERBY Whether a conservator gets included or excluded depends very much on the monetary value of the objects being conserved. Portable paintings and objects acquire a monetary value, so therefore, having a conservator involved can be justified. That's not usually the case with wall paintings, since however valued they are in other ways, they do not acquire an equivalent monetary value. Issues of the exclusion of conservators are not just regional but global. They take different forms, but at their heart is conservation education and occupational status. One of the big changes in the last two decades is the explosion

of brief conservation courses, which confer a qualification after very little time. That undermines more serious, long-term conservation education. People can emerge from a few weeks' training and call themselves conservators. It's not surprising that we're not taken seriously.

MATERO Part of the solution has to be getting minimum requirements in place contractually, so that individuals cannot work on a government contract or on a listed building unless they have certain qualifications that would have to come from a governmental agency.

RICKERBY Many major conservation decisions are not made by conservators. They're in the hands of administrators and funders, who do not have a good idea about our conservation aims, as this is not their job. So the responsibility rebounds onto us.

LOWINGER I have a very strong feeling about this. Instead of talking to ourselves, we need to learn how to use the media better. We need to put out the message that without us at the table, you could have a potential disaster on your hands. We need to use the media, the Internet, television, radio, and books to convey a message about conservation that is exciting, that is appealing, and that puts us in the role of a hero. A twelve-episode Discovery Channel, I'm telling you. I'd start with Stephen. I'd put him on camera and follow him into the tomb of Tutankhamen. People would watch it the way they watch *Antique Roadshow*.

MATERO There's certainly no lack of programming on cultural resources. There are plenty of shows on Egyptian tombs, Maya ruins, and classical sites. The problem is—the conservator is invisible. We haven't been savvy in using the media to raise public awareness about what we do and why. High on the list in strategic planning for projects should be public outreach. Every time I've submitted a budget for videography for external projects that I am involved with, this item has been nixed. If I were a funding agency and entertaining conservation projects, I would insist that there be a public outreach component that goes beyond lip service.

RICKERBY We're talking about raising our profile and about the vehicles for doing that. Obviously we need to be vocal. And we need to be turning out people who have the ability to engage in critical thinking. Because as conservators, we're at a critical interface among contractors, other people involved in conservation work, and the wall paintings. We are right there, on the front line. It all passes through our hands. So it really does depend on our competency in the end.

Join the discussion online at
www.getty.edu/conservation/25_2/dialogue.html

Key Resources

Decorated Architectural Surfaces



ONLINE RESOURCES

ICOM-CC Working Group on Mural Paintings, Mosaics, and Rock Art
www.icom-cc.org/22/working-groups/mural-paintings,-mosaic-and-rock-art/

ICOMOS Committee on Mural (Wall) Painting Conservation
www.icomos.hu/dhg/hun/267/downloads/statu_icomos_wp_2009.pdf

Institute of Conservation (ICON), Stone and Wall Paintings Group
www.icon.org.uk/index.php?option=com_content&task=view&id=30&Itemid

International Committee for the Conservation of Mosaics (ICCM)
www.iccm.pro.cy/

Mural Painting and Conservation in the Americas
Selected presentations from a 2003 symposium organized by the GCI and the Getty Research Institute
www.getty.edu/conservation/public_programs/conferences/mural.html

Rescue Public Murals
www.heritagepreservation.org/RPM/about.html

**La section française de l'Institut international de conservation (SF IIC),
Groupe de Travail sur les Peintures Murales**
<http://sfic.free.fr/>



BOOKS, JOURNALS & CONFERENCE PROCEEDINGS

Architectural Ceramics: Their History, Manufacture and Conservation: A Joint Symposium of English Heritage and the United Kingdom Institute for Conservation, 22–25 September 1994, edited by Jeanne Marie Teutonico and Kit Wedd (1996), London: Earthscan.

Architectural Tiles: Conservation and Restoration by Lesley Durbin (2005), Amsterdam and Boston: Butterworth-Heinemann.

Atti del Convegno Scienza e Beni Culturali [Proceedings of the Conference on Science and Cultural Heritage] Bressanone. Arcadia ricerche, Venezia. Conferences focused on decorated surfaces, held in 1985, 1990, 1992, 1995, 1997, 2001, 2002, and 2005–2007.
www.arcadiaricerche.it/editoria.htm.

Il colore nell'edilizia storica: Riflessioni e ricerche sugli intonaci e le coloriture, volumes 1 and 2. *Atti del Convegno, Roma, 25–27 ottobre 1984. Bolletino d'Arte, Supplemento*, nos. 35 and 36 (1984), Rome: Istituto Poligrafico e Zecca dello Stato.

The Conservation of Decorated Surfaces on Earthen Architecture: Proceedings of an International Symposium Organized by the Getty Conservation Institute and the National Park Service, Mesa Verde National Park, Colorado, USA, September 22–25, 2004, edited by

Leslie Rainer and Angelyn Bass Rivera (2006), Los Angeles: Getty Conservation Institute.

Conservation of the Last Judgment Mosaic, St. Vitus Cathedral, Prague, edited by Francesca Piqué and Dusan Stulik (2005), Los Angeles: Getty Conservation Institute.

Conservation of Wall Paintings by Paolo Mora, Laura Mora, and Paul Philippot (1984), London and Boston: Butterworths.

The Conservation of Wall Paintings: Proceedings of a Symposium Organized by the Courtauld Institute of Art and the Getty Conservation Institute, London, July 1987, edited by Sharon Cather (1991), Los Angeles: Getty Conservation Institute. www.getty.edu/conservation/publications/pdf_publications/panelpaintings.html.

Conservation-restauration des peintures murales de l'Antiquité à nos jours by Geneviève Reille-Taillefert (2010), Paris: Éditions Eyrolles.

Conserving the Painted Past: Developing Approaches to Wall Painting Conservation: Post-prints of a Conference Organised by English Heritage, London, 2–4 December, 1999, edited by Robert Gowing and Adrian Heritage (2003), London: James and James.

El estudio y la conservación de la cerámica decorada en arquitectura: Un compendio de colaboraciones: Roma, enero 2001–junio 2002, edited by Alejandro Alva Balderrama, Ana Almagro Vidal, and Isabel Bestué Cardiel (2003), Rome: ICCROM, Academia de España en Roma. www.iccrom.org/pdf/ICCROM_ICSO1_CeramicaDecorada00_es.pdf.

GraDoc: Graphic Documentation Systems in Mural Painting Conservation: Research Seminar, Rome 16–20 November 1999, edited by Werner Schmid (2000), Rome: ICCROM.

ICOMOS Principles for the Preservation and Conservation/Restoration of Wall Paintings (2003). www.international.icomos.org/charters/wallpaintings_e.htm.

Lessons Learned: Reflecting on the Theory and Practice of Mosaic Conservation, Proceedings of the 9th Conference of the International Committee for the Conservation of Mosaics, Hammamet, Tunisia, November 29–December 3, 2005, edited by Aïcha Ben Abed, Martha Demas, and Thomas Roby (2007), Los Angeles: Getty Conservation Institute. Previous ICCM conference proceedings can be found at www.iccm.pro.cy/ICCMpublications.htm.

Retrouver la peinture: Études d'histoire de l'art, bilans de conservation, et exemples d'interventions: Séminaire international d'art mural, abbaye de Saint-Savin, Centre international d'art mural, 1–4 mai 1991 (1991), Vienne: Centre International d'Art Mural.

Technician Training for the Maintenance of In Situ Mosaics (2008), Los Angeles: Getty Conservation Institute and Institut National du Patrimoine, Tunisia. www.getty.edu/conservation/publications/pdf_publications/mos_tech_training_en.pdf.

For more information on issues related to decorated architectural surfaces, search **AATA Online** at aata.getty.edu/nps/

GCI News

Project Updates

MODERN PAINTS RESEARCH: CLYFFORD STILL

As part of the GCI's Modern Paints project, a number of case studies are being conducted on the materials used by important twentieth-century painters. One of these is focused on American Abstract Expressionist painter Clyfford Still (1904–1980) and is being conducted in collaboration with the ARTEX Conservation Laboratory, the Hirshhorn Museum and Sculpture Garden in Washington DC, and the Clyfford Still Estate.

The diversity of materials used in modern paints has important and direct implications for their conservation, since each type of paint is likely to display its own unique set of properties that will govern its responses to aging, environmental conditions, and conservation treatments. Although Still worked with relatively traditional paints, mainly oils, there has been much discussion and speculation over whether he hand-ground pigments directly into oil media or whether he used conventional tube paints. The large range of gloss often seen in his paintings (more readily achievable if he were able to control the amount of oil in his paints) and large drums of dry pigment found in his studio after his death both point to the likelihood that Still hand-ground his paints.

In January 2010, staff from the GCI and Hirshhorn Museum visited the ARTEX Conservation Laboratory to undertake a sampling campaign of ten important works representative of Still's oeuvre. The samples have been analyzed, and some important initial findings are emerging—perhaps most interestingly, the identification of castor oil, probably in combination with linseed oil, in a number of the paints. The exact interpretation of this is still unclear, but castor oil is known to have been a component in Bellini oils, a brand of tube oil color that was available in the United States during the period in which these works were created. The presence of castor oil might sug-



Susan Lake (Hirshhorn Museum) and Michael Schilling (GCI) preparing to remove a microscopic sample of paint from the edge of Clyfford Still's painting *1951-No.2 (PH-240)* for chemical analysis. Painting: © The Clyfford Still Estate. Photo: Tom Learner, GCI.

gest that not all Still's paints were hand-ground, although it cannot be ruled out that Still might have added castor oil to his linseed oil prior to grinding in his pigment.

A second endeavor was the cataloguing and sampling of a range of forty dry pigments found in Still's studio, which point to the likelihood that Still mixed his own paints. A sample of each pigment has been submitted for further analysis and will be entered into the GCI's reference collection of artists' materials.

The results of this project will form the basis of a publication in the GCI's *The Artist's Materials* books series, and will be disseminated at the Clyfford Still Museum, scheduled to open in Denver in late 2011. Many of the

paintings to be displayed in the museum have never before been exhibited.

The Modern Paints project is a central component of the GCI's Modern and Contemporary Art Research initiative, which takes a broad approach to the needs of this area of conservation with a range of scientific research projects, as well as with a number of conferences, events, and meetings that are intended to promote discussion of these issues and to help disseminate information.

For more information on the Modern Paints project, visit the project's Web pages at www.getty.edu/conservation/science/modpaints/index.html.

MOSAICS MANAGEMENT WORKSHOP HELD

In May 2010 the GCI, in partnership with ICCROM's ATHAR program and in collaboration with the Directorate General of Antiquities, Ministry of Culture of Lebanon, presented the three-week workshop "The Conservation and Management of Mosaics on Archaeological Sites." Held in Tyre, a World Heritage Site in southern Lebanon, this was the first in a series of training activities that will take place over the next several years as part of the MOSAIKON initiative, a strategic effort to address priorities for the conservation and management of mosaics on archaeological sites and in museums within the Mediterranean region (see p. 15). MOSAIKON is a partnership of four institutions: the GCI, the Getty Foundation, ICCROM, and the International Committee for the Conservation of Mosaics.

Fifteen participants, largely archaeological site managers and conservators from Algeria, Egypt, Lebanon, Morocco, Syria, and Tunisia, joined an international group of instructors to address topics relating to the in situ conservation and management of mosaics, ranging from management planning and documentation to conservation assessment, treatment interventions, and issues of site presentation. The workshop drew upon the GCI's experience in conducting similar training in Tunisia on the conservation and management of mosaics in archaeological sites.

This workshop is one component of a longer course that will continue over the next year by means of a professional mentoring process between the participants and the instructors to address the specific needs of the participants' work and the mosaics at their own sites.

For more information on MOSAIKON: A Regional Strategy for the Conservation of Mosaics in the Mediterranean Region, visit the GCI Web site at www.getty.edu/conservation/education/mosaikon/.

CHINA PRINCIPLES REVISION UNDERTAKEN

In 2000 China ICOMOS issued the document *Principles for the Conservation of Heritage Sites in China*, national guidelines for cultural heritage conservation and management that respect and reflect Chinese traditions and approaches to conservation under the country's existing laws for the protection of cultural heritage sites, and which were endorsed by China's State Administration for Cultural Heritage (SACH). The China Principles were developed in collaboration among SACH, the GCI, and the Australian Department of the Environment and Heritage.

Now, ten years later, the GCI has been invited by SACH to participate in the revision and expansion of the China Principles to encompass changes that have occurred in the legislation, management, and conservation of heritage sites in China. The revisions will also address areas of heritage not covered

in the original document, such as cultural landscapes, cultural routes, industrial heritage, and memorial sites. According to deputy director-general of SACH, Tong Mingkang, who is responsible for the heritage sites and monuments, "The Principles have been playing an active and significant role in the field of China's cultural heritage conservation and have become a channel for international heritage professionals to get to know and familiarize themselves with basic Chinese concepts in the field of cultural heritage conservation." As chair of China ICOMOS, Tong Mingkang has established a working group to assist international heritage professionals in this process; the group was convened in June 2010.

In May 2010 Tong Mingkang and the director of China's Academy for Cultural Heritage, Liu Shuguang, were hosted at the GCI for discussions of the revisions. As part of their visit, the SACH delegation also undertook a study trip to heritage sites in New Mexico, including the pueblos of Acoma and Taos and Bandelier National Park. The revisions to the Principles are expected to be completed by early 2012.

For more information on the China Principles, visit the GCI Web site at www.getty.edu/conservation/field_projects/china/index.html.

DOCUMENTING SPIRAL JETTY

In April 2010, the Getty Conservation Institute and the Dia Art Foundation undertook a second campaign of aerial photography of Robert Smithson's iconic *Spiral Jetty*, using a low-cost helium-filled balloon. This campaign, combined with a previous one, has resulted in important baseline documentation of the artwork, as well as some stunning photographs. The campaign was part of the GCI's long-term investigation of novel and cost-effective methods of documenting outdoor sites.

Spiral Jetty, created in 1970, is a 1,500-foot-long and 15-foot-wide coil of local basalt rock and earth that extends into Utah's Great Salt Lake. In 1999 Dia acquired the work as a gift from the Robert Smithson Estate, and in a review of its conservation needs, the foundation decided that a documentation and condition monitoring system would benefit the work's long-term preservation. In March 2009, Francesca Esmay, Dia's conservator, and Tom Learner,



Course participants and instructors discuss the significance, condition, and presentation of a mosaic pavement at the site of Tyre in Lebanon. Photo: Leslie Friedman, GCI.



Francesca Esmay of Dia and Rand Eppich of the GCI capturing aerial images of *Spiral Jetty* with a digital single-lens reflex camera during testing of a multiple helium balloon system. Art: Collection of Dia Art Foundation, ©Estate of Robert Smithson/Licensed by VAGA, New York, NY. Photo: Aurora Tang, GCI.

head of the GCI's Modern and Contemporary Art Research, approached Rand Eppich and Aurora Tang in GCI Field Projects, seeking a simple, consistent, and cost-effective means of documenting the work for monitoring its condition. In May 2009, the GCI-Dia team undertook documentation of *Spiral Jetty* using aerial balloon photography and other techniques.

In April of this year, the Dia-GCI team returned to the site to test improvements and modifications to the balloon system—in particular, methods of keeping the camera horizontal—and to undertake training of Dia Art Foundation staff so that they could conduct the annual documentation of *Spiral Jetty* independently using the same system. The images captured in 2009 and 2010 were corrected for radial distortion and scaled from measurements taken on-site with survey equipment. These images will be compared to the ones captured in the future to inform conservators of any changes taking place at the site. Further modifications to the camera system that can rotate the camera to a vertical position are being tested in order to expand the range of documentation to include large contemporary murals.

The GCI is building on this experience to refine methods for low-cost documentation of sites, as part of the Institute's larger effort to develop practical and cost-effective techniques to assist the conservation profession.

For more information on the GCI's initial documentation campaign of Spiral Jetty, see: www.getty.edu/conservation/publications/videos/focus/spiral_jetty.html.

MEGA—JORDAN DEPLOYED

The Middle Eastern Geodatabase for Antiquities (MEGA)-Jordan reached a major milestone in July 2010 when this new Web-based, Arabic-English geographic information system (GIS) was deployed by the Jordanian Department of Antiquities (DoA) for use in its offices. MEGA-Jordan was created by the GCI in partnership with the World Monuments Fund and the DoA, and it utilizes new technology and flexible, customizable open-source tools. Work on an Iraq version of MEGA is slated to begin after the Jordanian system is fully deployed. The system will be expanded to contain data for the protection of historic buildings and will be adaptable for use by countries internationally.

For more information on MEGA-Jordan, visit the project's Web pages at www.getty.edu/conservation/field_projects/jordan/index.html.

PANEL PAINTINGS BIBLIOGRAPHY AVAILABLE

The Getty Conservation Institute is pleased to announce the launch of the Panel Paintings Initiative project bibliography at gcibibs.getty.edu/asp/. This online searchable resource presents over one thousand bibliographic references to literature on the conservation of panel paintings and closely related subjects.

This bibliography is presented as part of the Panel Paintings Initiative—a collaboration of the Getty Conservation Institute, the Getty Foundation, and the J. Paul Getty Museum that

aims to provide opportunities for specialized training in the structural conservation of panel paintings and to advance the treatment of these works in collections.

For more information on the Panel Paintings Initiative, visit the project's Web site, www.getty.edu/conservation/education/panelpaintings/index.html.

Recent Events

GCI BOOK WINS AWARDS

The GCI publication *The California Missions: History, Art and Preservation* by Edna E. Kimbro and Julia G. Costello, with Tevvy Ball, has garnered a number of awards. The book was awarded the University of Mary Washington Center for Historic Preservation's 2010 Historic Preservation Book Prize, given each year to the book deemed to have "made the most significant contribution to the intellectual vitality of historic preservation in America." *California Missions* also received a Grand Prize at the 2010 International Book Awards as "The Best Non-Fiction Book of the Year." It also won the 2010 IBA award in the category of U.S. History. In addition, the book won the 2010 Benjamin Franklin Award, given by the Independent Book Publishers Association, in the category of History, and it received honorable mention at the 2009 PROSE awards of the Association of American Publishers, Professional and Scholarly Publishing Division, in the category of Architecture and Urban Planning.

VISITING SCIENTIST

Amanda Norbutus, from the University of Delaware Art Conservation Program, visited the GCI in April 2010 to study issues relating to conserving contemporary murals with GCI staff members Tom Learner and Leslie Rainer. She used pyrolysis gas chromatography–mass spectrometry (Py-GC-MS), Fourier transform infrared spectroscopy (FTIR), and other analytical techniques to further characterize the changes that have occurred to samples of modern paints that have been exposed to outside conditions. She participated in the application of anti-graffiti coatings to the Getty's test acrylic murals and took part in discussions



Staff from Jordan's Department of Antiquities with Rand Eppich (center left) of the GCI discussing techniques for using handheld GPS units. Photo: Alison Dalgity, GCI.

about their evaluation, as part of the GCI's Outdoor Painted Surfaces project.

VISITING PROJECT PARTNERS

In April 2010, **eight visitors from the Jordanian Department of Antiquities (DoA)** attended a three-week course at the GCI designed to equip them to train their colleagues throughout the country in the use of the newly developed Middle Eastern Geodatabase for Antiquities (MEGA)-Jordan system, which provides the DoA with a state-of-the-art tool to inventory, monitor, protect, and manage Jordan's countless archaeological sites. The training primarily covered the use of the system and related GIS technology, as well as sessions on international heritage guidelines, site assessment, and GPS recording.

Tang Wei, director of the Division of World Heritage, State Administration of Cultural Heritage of China (SACH), arrived at the GCI in April 2010 to undertake research on cultural landscapes and routes, historic industrial sites, and living historical sites. The focus of his work is the planned revision and expansion of the China Principles, which the GCI has been invited to undertake in collaboration with SACH (see p. 28). Tang Wei will be at the GCI until October 2010.

Upcoming Events

CONSERVATION GUEST SCHOLARS

The Getty Conservation Institute is pleased to welcome the 2010–11 Conservation Guest Scholars. The guest scholar program at the GCI supports new ideas and perspectives in the field of conservation, with an emphasis on the visual arts (including sites, buildings, and objects)

and on the theoretical underpinnings of the field. The program provides an opportunity for professionals to pursue scholarly research in an interdisciplinary manner across traditional boundaries, in areas of wide general interest to the international conservation community.

2010–11 Conservation Guest Scholars

Thalia Dorothy Joan Kennedy

Turquoise Mountain Institute for Afghan Arts and Architecture

"The Appropriate Revival of Artistic Traditions"
January–June 2011

Ian Donald MacLeod

Western Australian Museum

"Conservation of Shipwrecks: Sites and Collections"
January–May 2011

Tim Clifton Winter

University of Sydney

"Remains to Be Seen: How Asian Societies Negotiate Their Past"
January–June 2011

Dorji Yangki

Independent scholar, Bhutan

"Preservation of the Vernacular Architecture of Bhutan"
October–December 2010

The Conservation Guest Scholar Program is now accepting applications for the 2011–12 scholar year. To apply online or for further information, please visit the Conservation Guest Scholar Web page (www.getty.edu/conservation/education/scholars/index.html), or contact researchgrants@getty.edu. The deadline for applications is November 1, 2010.

POSTDOCTORAL FELLOWSHIP AVAILABLE

The application period for the 2011–13 GCI Postdoctoral Fellowship in Conservation Science is now open. This two-year fellowship provides experience in the field of conservation science to a recent PhD recipient in chemistry or the physical sciences who has an interest in the conservation of cultural heritage. The 2011–13 fellow will be an integral part of the Museum Lighting Research project team, as the GCI continues its studies of the effects of light on important colorants in Western art.

The deadline to apply is November 1, 2010.

For more information and to apply online, visit the Getty Foundation Web site at www.getty.edu/foundation/funding/residential/postdoctoral_fellowship_conservation_science.html.

GRADUATE INTERN PROGRAM

Applications are now being accepted for the 2011–12 Getty Graduate Internship Program. Graduate internships at the Getty support 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 curatorial, education, conservation, research, information management, public programs, and grant making.

The GCI pursues a broad range of activities dedicated to advancing conservation practice and education, in order to enhance and encourage the preservation, understanding, and interpretation of the visual arts. Twelve-month internships are available in the Field Projects, Science, and Education departments of the GCI.

Detailed instructions, application forms, and additional information are available online at the "Graduate Interns" section of the Getty Foundation Web site. For further information, contact the Getty Foundation at gradinterns@getty.edu. The deadline for applications is December 1, 2010.

2010–11 GCI Graduate Interns

Nikifor Haralampiev *St. Kliment Ohridski University, Bulgaria*

Conservation of Photographs Research and Training

Emily MacDonald-Korth *University of Delaware, United States*

Modern and Contemporary Art Research

Amarilli Rava *Courtauld Institute of Art, UK*

Conservation and Management of the Tomb of Tutankhamen

Peter Reischig *Delft University of Technology, Netherlands*

X-Ray Imaging of Works of Art

Cheng Yang *University of Southern California, United States*

Valley of the Queens

New Publications



Conserving Outdoor Sculpture ***The Stark Collection at the Getty Center***

Brian Considine, Julie Wolfe, Katrina Posner,
and Michel Bouchard

When the J. Paul Getty Museum received twenty-eight sculptures donated from the private collection of the late film producer Ray Stark and his wife, Fran, the sculptures thrust the Getty into the evolving field of outdoor sculpture conservation. To honor its responsibility, the Museum embarked on new research into the collection's materials—bronze, lead, ceramic, and painted metal—and construction techniques.

This book presents the conservators' comprehensive account of the process. Chapters are organized around phases of the project and address key issues facing those charged with caring for works of art displayed outdoors, including organization and planning; installation and grounds management; scientific analyses; collaborating with artists; structural issues; mounts, paint, coatings, and patinas; and long-term maintenance.

Brian Considine is head of the Department of Decorative Arts and Sculpture Conservation at the J. Paul Getty Museum. Julie Wolfe and Katrina Posner are associate conservator and assistant conservator, respectively, in the same department. Michel Bouchard is a former assistant scientist in the Collections Research Lab of the Getty Conservation Institute.



Willem de Kooning **The Artist's Materials Series**

Susan F. Lake

This in-depth study of the paintings of Willem de Kooning from the 1940s through the 1970s breaks new ground in its analysis of the artist's working methods and yields new information about previously unreported materials. De Kooning's idiosyncratic working methods have long engendered intense speculation and debate among conservators and art historians, primarily on the basis of visual inspection and anecdotal accounts rather than rigorous technical analysis. This is the first systematic study of de Kooning's creative process to use comprehensive scientific examinations of the artist's pigments, binders, and supports to inform art-historical interpretations, thereby presenting a key to the complicated evolution of the artist's work.

Susan F. Lake is head of collection management and chief conservator at the Hirshhorn Museum and Sculpture Garden, Smithsonian Institution, Washington DC.

CONSERVATION PERSPECTIVES THE GCI NEWSLETTER

VOLUME 25 • NUMBER 2 • FALL 2010

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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 Web site, www.getty.edu/conservation/.

The Getty Conservation Institute works internationally to advance the field of conservation through scientific research, field projects, education and training, and the dissemination of information in various media. In its programs, the GCI focuses on the creation and delivery of knowledge that will benefit the professionals and organizations responsible for the conservation of the visual arts.

The GCI is a program of the J. Paul Getty Trust, an international cultural and philanthropic institution that focuses on the visual arts in all their dimensions.



This publication was printed on Forest Stewardship Council (FSC)-certified recycled paper with vegetable-based inks at a facility using wind power. A donation to the American Forests' ReLeaf program has been made by the Green Print Alliance on behalf of the GCI, for its use of FSC-certified paper.



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