

Conservation

The Getty Conservation Institute Newsletter ■ Volume 20, Number 3 2005



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Volume 20, Number 3 2005

The J. Paul Getty Trust

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The Getty Conservation Institute (GCI) 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 devoted to the visual arts that also includes the J. Paul Getty Museum, the Getty Research Institute, and the Getty Foundation.

Conservation, The Getty Conservation Institute Newsletter, is distributed free of charge three times per 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

Front cover: Participants in the ICCROM-GCI 2005 advanced course in documentation, held in Rome. This four-week course for midcareer professionals and educators addressed the needs, methodology, and techniques for acquiring and using records, inventories, and information management tools for the conservation of cultural heritage. *Photo:* Alejandro Alva/Courtesy of ICCROM.



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By François LeBlanc and Rand Eppich

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A Note from the Director

By Timothy P. Whalen

THIS ISSUE OF *Conservation*, focused on the documentation of immovable heritage, is also a place to note a milestone for the Getty Conservation Institute. Twenty years ago, the first director of the GCI was appointed, and the staff moved into its first facility, in Marina del Rey, California.

The establishment of the Institute was the result of a significant decision by the Getty Trust—as part of its philanthropic mandate—to take a leadership role in conservation by addressing important needs of the field. This commitment by the Trust occurred at the beginning of a period of major growth in conservation, in terms of professionals, organizations, training, and public awareness. In its development as an organization, the GCI benefited from this growth and from the general flourishing of the conservation discipline. Since 1985, the board members and presidents of the Getty Trust have remained strongly committed to strengthening the field of conservation through the GCI's work in scientific research, model field projects, education and training, and the dissemination of information. Their steady support has been essential to the Institute's accomplishments.

In general terms, those accomplishments have included the development of expertise in a number of areas, among which are preventive conservation, methods for analysis of materials, conservation of wall paintings, earth and stone conservation, archaeological conservation, and site management. In order to advance conservation practice, the GCI has undertaken model field projects in Asia, Africa, North and South America, and Europe. In education, the Institute began by organizing courses for the profession; today it seeks to maximize its resources through collaborative initiatives that strengthen the existing educational infrastructure for conservation. In dissemination, the GCI maintains a multifaceted effort to share the results of its work and the work of others through a variety of means—from traditional publishing to electronic databases.

During this anniversary year, the GCI began a process of strategizing and prioritizing for the future. Our staff is currently engaged in charting the course of the Institute's work over the next five years, building on the GCI's established expertise while exploring new ways to benefit and serve the conservation profession.

Fundamentally, the achievements of the GCI are a measure of the skills, experience, patience, and dedication of its people. The staff of the GCI is the ultimate source of its strength as an institution. On behalf of that staff, I express our gratitude to the many colleagues and organizations around the world that over the last twenty years have shared our goals and have worked with us in pursuit of those goals. It is our hope that those relationships will continue to grow to the benefit of the field and that the next twenty years will witness a degree of progress that matches or exceeds that of the years that have now passed.

Documenting Our Past for the Future

By François LeBlanc and Rand Eppich

TODAY THE WORLD IS LOSING its architectural and archaeological cultural heritage faster than it can be documented. Human-caused disasters, such as war and uncontrolled development, are major culprits. Natural disasters, neglect, and inappropriate conservation are also among the reasons that our heritage is vanishing.

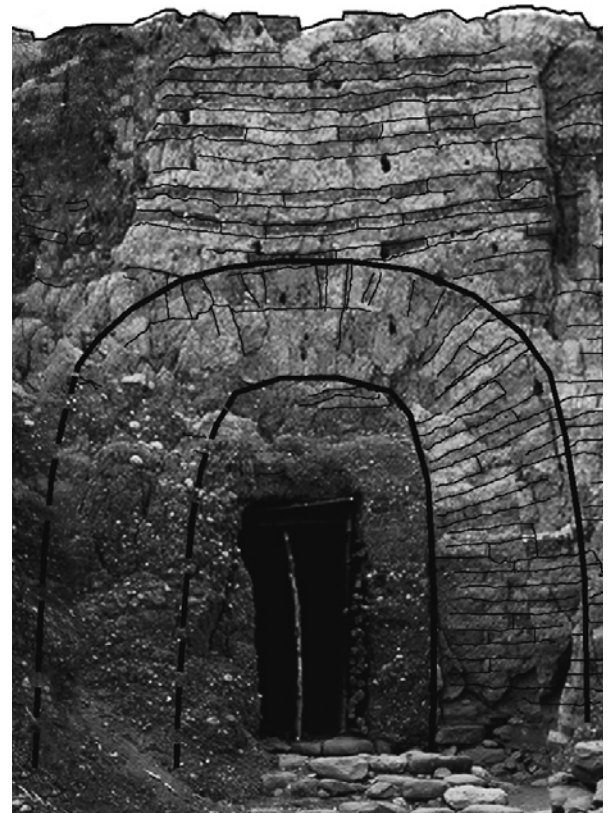
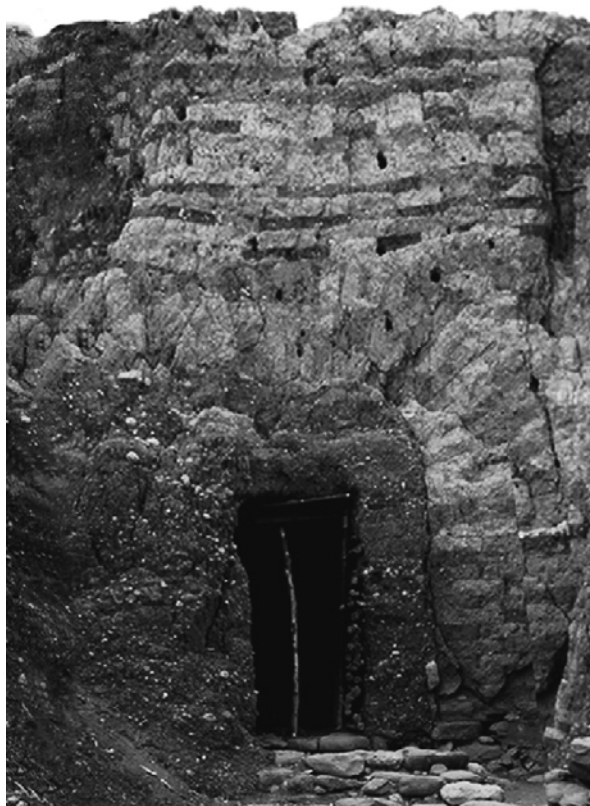
In Afghanistan we have lost to armed conflict archaeological remains and architecture for which we have limited or no documentation. At the January 2004 annual meeting of the Archaeological Institute of America, Abdul Wasey Feroozi, director general of Afghanistan's National Institute of Archaeology, reported on the impact of war upon his country's cultural heritage. Among the places destroyed in recent decades, in addition to the giant Buddha statues in Bamiyan, were the Buddhist temple of Tepe Shutur-e-Hadda and the tower of Chakari, an important monument from the first century. "In a war-stricken country," stated Feroozi, "one can repair or even renovate roads, bridges, schools, hospitals, et cetera,

but lost and destroyed cultural heritage can never be rehabilitated or renovated."

Contemporary urban developments can also wipe out centuries of unrecorded history. On the outskirts of Mexico City, the pre-Columbian Aztec site of Xochimilco is under threat because of urban sprawl; information from earlier periods of history is likely to be lost with rapid modern construction. In sites such as this, it is possible to use the latest technology to record information about the archaeological remains, either to capture the knowledge before construction proceeds or to alter the course of development. This happens too rarely.

And what of Mother Nature? At the end of August 2005, along the U.S. coast of the Gulf of Mexico, the city of New Orleans and other historic cities and towns were savaged by Hurricane Katrina. In addition to the tragic and extensive loss of life, the hurricane damaged or destroyed countless historic structures, public

The archway of the Canaanite gate in Tel Dan, Israel, with descriptive overlay highlighting the arch. Without proper documentation, it is almost impossible to distinguish the mud brick arch from the surrounding earth. Documentation work also enabled archaeologists to date the arch accurately, demonstrating that this construction technology existed far earlier than previously thought. *Photo and overlay: Rand Eppich.*





English Heritage staff conducting a photogrammetric survey of the exterior of Windsor Castle. Documentation can provide a lasting record of cultural heritage—essential for conservation or recovery from an unforeseen catastrophic loss. When a disastrous fire in 1992 destroyed much of Windsor's St. George's Hall and Grand Reception Room, English Heritage was able to use photographic documentation taken years earlier, as well as new material, to guide restoration work. *Photo:* Courtesy of English Heritage, with acknowledgment of the Royal Household at Windsor Castle.

Defining Documentation

Documentation of cultural heritage, broadly defined, includes two main activities: (1) the capture of information regarding monuments, buildings, and sites, including their physical characteristics, history, and problems; and (2) the process of organizing, interpreting, and managing that information. Reasons for engaging in documentation include:

- assessing the values and significance of the heritage in question;
- guiding the process of conservation;
- providing a tool for monitoring and managing heritage while creating an essential record; and
- communicating the character and importance of heritage.

Archaeological sites offer good examples of how documentation contributes to heritage conservation. Partial foundations, incomplete walls, and scattered debris found at an excavation can make it difficult to interpret. In northern Israel at the archaeological site of Tel Dan, there is one of the earliest known examples of a complete arch, the archway of the Canaanite gate—dated to the middle Bronze Age (mid-eighteenth century BCE). Without proper documentation by archaeologists and surveyors, it is almost impossible to distinguish the mud brick arch from the similarly colored surrounding earth. Proper documentation has also enabled archaeologists to date the arch accurately, demonstrating that this building technology existed far earlier than previously thought—thus according the site greater significance. Good documentation of a site allows for a better understanding of its value—historical, scientific, aesthetic, social, and economic. Recognition of a site's value and significance is often the first step toward its conservation.

Once conservation begins, those involved in the process need access to comprehensive information about the site. This information—obtained through documentation—allows conservation professionals to record current conditions, consider appropriate conservation options, plan interventions, apply treatments, and, finally, measure the results of their efforts. In 2001 a team from the University of Pennsylvania's Graduate Program in Historic Preservation did just that at New Orleans's historic St. Louis Cemetery No. 1 (which reportedly survived the city's flooding with relatively minor damage). Each above-ground tomb was evaluated for its original design, date of construction, state of conservation, and subsequent changes and repairs. This information led to emergency stabilization, to preliminary treatment, and, eventually, to conservation. It also allowed the limited resources available to be directed toward those monuments that were both significant and in advanced states of deterioration. Good documentation saves both time and money by helping prioritize resources and by preventing a duplication of effort.

and private, altering forever the architectural landscape of the communities that suffered under the force of the storm. Although the impact on the region's cultural heritage is still being assessed, significant damage clearly occurred, including the eradication of some historic cityscapes.

The stories go on, year after year, decade after decade. Unfortunately, so does the loss of cultural heritage for which we have little or no lasting record.

While we should strive to preserve as much as possible of our architectural and archaeological cultural heritage, we cannot save everything. One option is to document heritage before it is lost. A permanent record will transmit knowledge of these places to future generations. Equally important, documentation is the thread that runs through the entire process of cultural heritage conservation. Indeed, documentation can help keep heritage from being destroyed or forgotten, and it serves to communicate, not only to conservation professionals but to the public at large, the character, value, and significance of the heritage.

After conservation intervention, documentation provides the basis for monitoring, management, and routine maintenance of a site, as well as a record for posterity. A record of interventions is indispensable for conservation treatment, as it establishes baseline conditions that inform future evaluations and retreatments. Heritage sites undergo continuous change, and the availability of a concise description of previous problems and interventions makes it easier to identify emergency situations and to react with appropriate investigation and treatment. It also allows managers to budget for ongoing conservation needs. In addition, actions taken today become part of a place's history; future generations must know how conservation was carried out. Conservation interventions are critical moments in the life of a building or site, and a careful record can preserve information that may otherwise be lost. For example, during a 1985 project to upgrade the electrical wiring in Windsor Castle, photographic documentation of the State Apartments was conducted. When a disastrous fire in 1992 destroyed much of St. George's Hall and the Grand Reception Room, English Heritage was able to use this documentation to help guide subsequent restoration work.

The importance of documentation extends beyond its use as a tool for conservation and a record for posterity. It is also the means by which information can be communicated—information that can help educate the public regarding the values a site holds and the ways in which conservation has been conducted.

Communication from the public can also impact the conservation of a site and is, therefore, an important element of documentation. In the city of Vienna, for example, the public contributes to the city's conservation via the Internet by submitting information that defines or increases the historic value of certain properties. In many instances, the public is the first to raise the alarm about sites that are under threat from alteration or demolition.

What Is Needed

How is the process of documentation embraced internationally? The short answer is—not well at all. Although the importance of documentation for cultural heritage has been stressed in many national and international instruments—from the Athens Charter of 1931 to the Venice Charter of 1964 to Australia's Burra Charter, as well as dozens of other recent declarations and conventions—documentation remains inadequately employed.

In 2002 the Getty Conservation Institute convened a meeting of experts in Los Angeles to discuss documentation. Among the thirty international participants representing various disciplines and regions, there was general agreement that the situation required review and improvement. There was similar consensus at the 2005 annual meeting of the American Institute for Conservation of

Historic and Artistic Works. The speakers at that meeting generally concurred that the field lacks standards and guidelines, as well as communication among professionals. They also agreed that there are limited resources, incomplete tools, and insufficient training.

Few international standards for recording and documentation of cultural heritage are in place. Conservation documentation varies in form, quality, and quantity from one project and professional to the next. If there were international standards for the recording of conditions such as the identification of cracks, bulges, humidity, or other unstable conditions, then professionals could communicate more easily, saving both time and money. Even the format for dates is unresolved. The International Standards Organization format for dates (yyyy/mm/dd) has yet to be adopted by the conservation field. One can easily understand the importance of such a basic standard in a world of databases.

Background research prepared by historians and investigation plans developed by conservation architects, if standardized, could be used more easily by other professionals to prepare treatments and architectural proposals. Currently, the symbols used to draw different materials, various conditions, and subsequent treatments are left to individual professionals. While other disciplines have such

A conservator conducting a condition survey of the carved face of the stone blocks that compose the hieroglyphic stairway at the Maya site of Copán in Honduras. The capture of information regarding monuments, buildings, and sites—including their physical characteristics, history, and problems—and the management, interpretation, and presentation of that information are the main activities of documentation. Photo: Elsa Bourguignon.



Survey of Shuxiang Temple at the Chengde Imperial Summer Mountain Resort in northeast China. The GCI has provided training to Chinese professionals in the use of the theodolite to map the temple complex as part of the development of a conservation and management plan for the Chengde site. *Photo: Neville Agnew.*



As part of a UNESCO World Heritage Centre training program in Saqqâra, Egypt, Gaetano Palumbo, director of archaeological conservation with the World Monuments Fund, shows a trainee how to capture an image that can be digitally rectified. Low-cost and low-tech tools and methodologies, such as scaled and semi-rectified photography, could satisfy a significant portion of the recording and documentation needs in many developing countries. *Photo: Rand Eppich.*

basic standards, the field of heritage conservation, in which projects are often seen as unique, does not. In fact, there is a great deal of commonality in conservation, and some standardization would help.

Conservation management guidelines exist, but few of these refer to the importance of recording and documentation as activities that exist throughout the conservation process. Knowledge and understanding are prerequisites for good heritage management and for the planning of sensitive and appropriate conservation interventions. Documentation is the medium through which this knowledge is recorded, collected, and stored. Without guidelines, communication is more difficult.

Currently, best practices for documentation are not widely exchanged inside the conservation field. There are few international periodicals or Web sites that allow experts to share their knowledge. In addition, less than satisfactory levels of human and financial resources are dedicated to documentation activities.

Outside the field, decision makers are often unaware of the purposes and benefits of documentation, and therefore, they underfund it. If these benefits were more effectively communicated, greater resources could be allocated, and duplication of work could be reduced, decreasing the cost of conservation. Such additional recording would provide better understanding of the resource, its features, and its condition, and would increase knowledge about it. The result would be a higher quality of conservation practice.

There is a good array of low-cost recording tools and methodologies that are not being systematically applied in the conservation field. In addition, new information is not widely shared, and many Web resources concerning recording and documentation of cultural

heritage are not generally known. There is a need to make greater use of low-cost and low-tech tools and methodologies that could satisfy a significant portion of the recording and documentation needs in many developing countries. For example, simple scaled and semi-rectified photography of relatively flat surfaces (e.g., floor mosaics, building elevations, stone patterns, etc.) can be achieved with an inexpensive digital camera that has a grid integrated into its viewer, or with other simple equipment or techniques used in conjunction with the camera. The relatively low level of accuracy produced by these methods is acceptable for preliminary recording or uncomplicated conservation work.

There is also an urgent need to develop and adapt computer technologies and advanced technological tools to help deal with the sheer number of sites, buildings, collections, and information that need to be preserved. New technologies can certainly help reduce the cost and time necessary to record and document cultural heritage. At the same time, significant research and investigation are required to ensure that the digital record created by these new technologies is preserved in the long term, given the constantly changing technological environment.

While a growing number of information users are requesting training in documentation, there are only a handful of institutions that offer courses in this field. The amount of knowledge needed to document historic resources adequately is substantial. Unfortunately, there are few, if any, institutions in the world currently offering this comprehensive training specifically for conservation.

What Is to Be Done

Despite the many problems in the documentation field, there are institutions and organizations working toward improvement in each of these areas.

CIPA Heritage Documentation—the International Committee for Architectural Photogrammetry—has held biennial meetings for several decades and has published the results of these meetings in order to improve various aspects of recording and documentation. The symposium's theme in 2005 was international cooperation to save the world's cultural heritage. It was intended to underscore the concept that only international cooperation between public and private endeavors can provide effective solutions to safeguard and preserve cultural heritage for future generations.

In 2002 CIPA, ICOMOS, and the GCI teamed up to create the RecordIM Initiative. One goal of this five-year partnership is to develop principles and guidelines for creating and using heritage documentation. The initiative and its publications are designed to aid communication among information users (e.g., researchers, conservation specialists, and project managers) and information providers (e.g., photographers, heritage recorders, photogrammetrists, and surveyors). It is also intended to assist decision makers in governments, institutions, and education to adopt and follow principles and guidelines. One planned publication for practicing conservators, architects, and engineers will include case studies that illustrate the availability and application of a wide variety of tools.

There are other initiatives and organizations working toward better guidelines, standards, and communication. Among them is the International Council on Archives, which met in the United Arab Emirates in November 2005 to discuss issues such as electronic records, the preservation of archival records, and education and training. ARMA International, a leading authority on managing records and information, continues to offer resources such as legislative and regulatory updates, standards and best practices, technology trends and applications, classroom and Web-based education, marketplace news and analysis, and books and videos on managing records and information.

English Heritage, the custodian of cultural heritage in England, has also put resources into developing new tools for documentation. In addition, it has published a manual for perform-

ing metric surveys, created standards for requesting laser scanning services, and developed new software to help with recording buildings and sites. The Forum on Information Standards in Heritage groups together U.K. and Irish institutions that are working on creating standards. These efforts will help create consistent records and find the tools to index and retrieve heritage information.

Last, several training initiatives have been conducted by international heritage organizations. In 2003 and 2005, ICCROM held advanced courses in documentation for midcareer professionals and educators from around the world. These four-week courses covered simple techniques, such as hand measurements, and more high-tech methods, including global positioning system (GPS) technology and photogrammetry (obtaining reliable measurements by photography). UNESCO's World Heritage Centre also held documentation courses in 2004 for participants from Arab countries. The World Monuments Fund and the GCI have been conducting a series of training courses to assist the Iraqis in mitigating threats and in repairing damage sustained by their cultural heritage during war. A large part of this program is recording the damage and threats to sites, in order to prioritize interventions, given the limited resources available (see page 17).

Even with these organizations and their efforts, significant challenges still exist. The sheer number of cultural sites that are without sufficient documentation is staggering. Some estimate that only a third of the eight hundred sites on the World Heritage List are adequately documented. Certain situations, such as underwater archaeology and cultural landscapes, pose new issues and challenges.

We cannot stop the loss of cultural heritage. But we can do a better job of documenting heritage. When conflicts, disasters, and uncontrolled development occur, the only remaining evidence of the lost heritage is often documentation. By creating standards and guidelines, dedicating additional resources, developing new tools, and increasing training efforts, we can begin to do a better job at highlighting the heritage that we have and increase the possibility that efforts will be taken to save it. It is a challenging mission—but not an impossible one.

François LeBlanc is head of Field Projects for the GCI. Rand Eppich, a project specialist with Field Projects, manages the GCI's Digital Laboratory.

Web Links to Selected Institutions and Organizations Involved in Documentation

CIPA Heritage Documentation | The International Committee for Architectural Photogrammetry | cipa.icomos.org

The International Council on Archives | www.ica.org

ARMA International | www.arma.org/index.cfm

English Heritage | www.english-heritage.org.uk

The Forum on Information Standards in Heritage | www.fish-forum.info

The RecordIM Initiative | A Project of CIPA, ICOMOS, and the GCI | www.getty.edu/conservation/field_projects/recordim/index.html

People and Technology

A Discussion about Heritage Documentation

How does one define documentation in the context of cultural heritage? What are the critical elements in undertaking documentation that can help ensure its effectiveness before, during, and after conservation? Three experts who have extensively produced or utilized documentation offer their perspectives on this somewhat overlooked aspect of the conservation process.

Alonzo C. Addison is president of the Virtual Heritage Network and currently serves as special advisor to the director of the UNESCO World Heritage Centre, guiding technology deployment for the heritage arena and for UNESCO's World Heritage portal. He founded the Center for Design Visualization at the University of California, Berkeley, and in the early 1990s he helped create the first high-accuracy long-range laser scanner as vice president of Cyra Technologies (now Leica Geosystems).

Paul Bryan is the head of the Photogrammetric Unit of English Heritage, and the leader of the Metric Survey team. Prior to joining English Heritage in 1985, he spent several years working on surveying contracts in the United Kingdom, Iraq, and Kuwait. Based in York, Paul is an active member of the U.K. Remote Sensing and Photogrammetry Society (RSPSoc), as well as the U.K. representative for CIPA Heritage Documentation, the ICOMOS and ISPRS International Committee for Architectural Photogrammetry.

Werner Schmid is a freelance conservator of mural paintings and related architectural surfaces, practicing mainly in Italy. From 1990 to 2000, he worked as a project manager at ICCROM, supervising a variety of efforts, including training courses and technical meetings. While at ICCROM, he coordinated the research seminar GraDoc—Graphic Documentation Systems in Mural Painting Conservation—and was the editor of the proceedings, which were published in 2001.

They spoke with Rand Eppich, a GCI project specialist who manages the Institute's Digital Laboratory, and Jeffrey Levin, editor of Conservation, The GCI Newsletter.

Jeffrey Levin: *How would each of you, in a concise way, define documentation?*

Werner Schmid: For me, documentation is the knowledge base that reflects our current understanding of the heritage itself. It includes all the published and unpublished information, both visual and textual. Our understanding of the heritage is under constant revision, and as new information comes in, the documentation of the heritage grows and develops over time. In terms of activity, documentation means the recording of new information that comes from conservation and research activities that are dedicated to a given heritage. It is certainly a multidisciplinary activity, which consists of research, recording, evaluating, interpreting, correlating, archiving, managing, and disseminating information. It involves written reports, surveys, photographic records, and the establishment of digital databases that try to make all relevant information accessible in one place. I see documentation as a medium through which the results of research and conservation activities are communicated and shared when a project is under way, but also in the future. As such, documentation has an essential position within conservation and research and is a reference for all involved in these processes.

Paul Bryan: I concur. Within my particular context, documentation involves creating supporting records for a project, which assists in monitoring, understanding, and conservation. In terms of the actual activities, that includes metric surveys in various analog and digital forms, which describe the spatial relationships of a building or place. As mentioned, documentation also includes photography— analog and digital—historical analysis, both architectural and archaeological, previously published works, and, of course, the actual conservation analysis and the treatments themselves.

Alonzo C. Addison: Are we talking about documentation as a noun—the *documentation*—or as a verb, *to document*?

Levin: *I think we're talking about both.*

“Whatever is produced by recording certainly must be usable in the immediate sense, but to justify the time and cost, it needs to have a longer-term use as well.” —Paul Bryan



Photo: Courtesy of English Heritage

Addison: I think to document something is to bring together all of the knowledge about that object, that cultural heritage, into one place. The most basic is the dimensional documentation, the measurement of an object, the recording of it. With the advent of digital technologies, it has become easier to document and easier to integrate the many forms of documentation. We now can go from the traditional *dimensional* to the *locational* and the *visual* and, finally, to what I call the *environmental*, which is all the other scientific measurements. In addition to that, there is all the knowledge, the history, and so on about cultural heritage that we want to include in that knowledge base.

Schmid: I tried in my first answer to give a more general definition of documentation, including all written and visual information. Many people think documentation is mainly about the dimensional representation of the physical configuration of a heritage. But this is just one part of the documentation.

Addison: It's good to define it in the broader sense. Dimensional documentation, which is what many documentation and recording professionals think of when they talk about documentation, may work well for a physical object such as an existing historic building in Europe, where you can utilize tools from analog to visual—a tape measure, survey equipment, a laser scanner, or even a camera—to capture the dimensions. But that's a very different sort of documentation than trying to capture Aboriginal cultural heritage in Australia, where you have much less physical presence and you need to rely on stories and imagery and other elements.

Rand Eppich: *Werner, maybe you can comment on documentation as applied toward conservation.*

Schmid: Conservation documentation is certainly all the information that is needed to plan conservation—to understand, first of all, the heritage, which is a prerequisite for starting any project planning—then all the information that is necessary to identify the problems and to understand the materials, the physical evidence. Conservation itself is an opportunity to review the history and knowledge we have of a heritage—so it is very important to record and to document all new discoveries that arise during a conservation treatment. The documentation of the condition after treatment is also very important for any future evaluation of the treatment. Documentation always has this dimension of before, during, and after.

Levin: *Are any of those more important than the others? Do they all have equal importance?*

Bryan: Each project is different. I try to promote people discussing more than the immediate project requirements. Whatever is produced by recording certainly must be usable in the immediate sense, but to justify the time and cost, it needs to have a longer-term use as well. I'm sometimes concerned that the level of documentation for projects is far too large for the immediate requirements—that there are several volumes of documentation produced, which may perhaps go into a cabinet simply to gather dust. That can't be allowed to happen, so we've got to look at the longer-term use of the documentation.

Addison: That alludes to a fundamental problem—a lot of the documentation isn't documented. If you don't document the documentation, let alone deal with how to preserve it in the media that you've recorded it in, is the entire effort useless? In the digital world I see this enormously. People take a digital photo of something, but unless they mark exactly what they took the picture of, it could be useless. The amount of effort to decode that piece of documentation becomes so large that it's easier and cheaper to send somebody back to redo it.

“It’s important that we don’t forget that documentation isn’t just for the conservation community but serves a much broader public need.”

—Alonzo C. Addison



Photo: Jeremy Pollard

In talking about the purposes that documentation serves, I think we’re missing a whole category of things. Documentation is also the basis of everything that goes into dissemination—presentations, education, television documentaries, games that help children learn. Documentation serves those purposes—which, in turn, help the conservation process because it makes the public more aware. It’s important that we don’t forget that documentation isn’t just for the conservation community but serves a much broader public need—which, in turn, helps conservation because it raises awareness and money.

Bryan: In England, we talk about the *virtuous circle*, a cycle that starts with understanding the historic environment. Once people understand it, they start to value it—and if they value it, they’ll start to care for it. That caring will actually lead people to enjoy the heritage—and once they enjoy it, then there will be a desire for more understanding about it. So, yes, the products of documentation are needed not only to preserve, prepare, record, and represent but also to disseminate and present.

Schmid: I agree that good documentation can provide material that can be also used for educational purposes and promotion. But this information must be processed and expressed in different ways if it’s targeted to nonspecialists.

Eppich: *Paul, does English Heritage have a way to do this when a project begins? Do they have a formal protocol to sit down and say, “we want these products at the end”?*

Bryan: It tends to vary from project to project. One issue that we’re currently facing is that while we’re not moving away from conservation, the current priority seems to be on the *understanding* of the heritage—and if you’re just focused on understanding, that can alter the level of recording that you need to undertake.

Schmid: The most frequent answer to the question of *why documentation?* is to create a permanent record, a sort of warranty against loss. This is based on a realistic view that we cannot preserve everything and that much of our heritage will be a victim of modern development, wars, or natural disasters.

Levin: *To create a permanent record is, of course, to beg the question of what the nature or character of that record should be. Is the field generally missing a clearly stated understanding of what the standards and the process should be when one undertakes documentation?*

Addison: People are quite savvy, but the problem is changing projects and changing needs. Perhaps it’s not as much standards as it is better definitions and better guidelines. For example, if you take a digital photo, there are pieces of the knowledge base that need to be attached to that photo: *who* took the photo, on what *date*, and with what *device*, a *description* of what you’re documenting, *why*, and other metadata. I prefer the idea of guidelines to the idea of standards, which is an area that the Getty can help with.

Eppich: *Aren’t some guidelines out there, but they’re just not used? I know there are guidelines for photography. But how do you get people to use them? How do you enforce them?*

Addison: It’s training and education. The problem is that we have experts in many subareas. Professional photographers are pretty good about marking up their photos and cataloging them when they’re in the field. But a heritage recording expert who may be trained in the use of the theodolite doesn’t know about that piece of it. I think it’s just training and guidance, maybe, disseminated through international organizations. Standards can backfire because people are very resistant and because they take so long to get everyone’s agreement that by the time that they are agreed upon, they’re obsolete.

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Bryan: English Heritage has been generating standards in our field for a number of years. However, they cannot just sit on a shelf to be referred to year after year. To maintain their currency, they need to be continually updated, so that when new technology, like laser scanning, comes along, it can be effectively integrated into the process. Standards take an enormous amount of time and effort to collate, but when nonspecialists want to know how to specify a measured survey, for example, the necessary detail of the document may simply put them off. It's a difficult area, but standards, whether we like them or not, effectively underpin all of the work that we do. This is an area where I see the Getty being well placed—not to generate standards but to provide guidelines on how standards ought to be developed and maintained across the heritage sector.

Schmid: As an information technology user, I think that conservation and documentation are case-by-case issues and that it's very difficult to define detailed standards for the field. I agree that what's really missing are guidelines. A very hot issue that has developed with the advent of computer technology in heritage documentation is that we have, on one side, a segment of rather computer-illiterate conservation professionals and, on the other side, information technology specialists trying to sell their products. Guidelines are needed that give technology users some information on the basic functioning of these tools and that explain the pros and cons and the costs. The users have to have enough information to be able to choose the method that best matches their needs and to be able to communicate with information technology specialists in a more productive way.

Levin: *What about the issue of access to tools? Tools that are available in one part of the world may be much less available in another part, yet the need for documentation is no less.*

Addison: I used to think that there was limited access to tools. We've been working with UNESCO, looking at information technology and disseminating it, and our assumption was that in the developing world people don't have Internet access or they have slower access, and they don't have digital cameras. But we were surprised. It's almost the reverse. They have Internet access in the developing world that's typically pretty good—it may be in a café instead of at home, but statistics on browsers being used, processors, and operating system levels are impressive. To me, it's not as much a problem of access to tools but, rather, what we do with the tools we have. You can have the fanciest tool in the world, but if you don't use it to record useful things or don't put the metadata on the recording, it's still worthless. A lot of people talk about getting all these tools to the developing world. More important, I think, is one hard-coated sheet that states, this is the metadata that you should attach, whether you do it by hand or otherwise. Often when I lecture, I give a time line: stone lasts thousands of years, wood and paper hundreds of years, and digital media—CD, magnetic tape—tens of years. Even worse than the medium is the format: how it's encoded on the software. This lasts in the single digits at most. That seems to me the fundamental problem. Getting advanced tools into developing countries is important. But more fundamental is getting them guidelines.

Bryan: Rather than shipping new technology to developing areas of the world, the emphasis ought to be on making them aware of what the technology can and cannot do. This goes back to putting together some guidelines on what different technologies can do. The issue of people in developing countries not being able to get hold of a personal computer or access to the Internet is not going away, but it's certainly diminishing. More important is an appreciation by people of what is available and what technology can do for them. Once they see that, then maybe efforts from countries like ours can help provide them with access to some of that technology.

Schmid: Laser scanning is probably the most detailed measured survey tool, but in most cases there are alternative methods. I would rather ask what is the need in a particular recording project, and what are the options that we have to respond to that need? It might not be only a laser scanner. In countries where the workforce is less expensive than equipment, they could do it with hand measurements and come up with a similarly valuable result.

Bryan: We're applying close-range laser scanning on some of our projects—but not on every single one. On some projects we've even got nonspecialists who want to generate data themselves. Here imaging is probably a more effective tool that could be used by the majority of people, where all they really need is a hundred-dollar digital camera.

“One of the huge potentials that new information technologies and information management tools offer us is a better way to communicate and share our results.”

—Werner Schmid



Schmid: Rectified photography is in many cases more than sufficient—and it’s simpler and cheaper.

Bryan: I’m currently involved in a rock art recording project, where we’re using volunteers who do not necessarily have a survey background but share a common interest in rock art and have some spare time. We’re using laser scanning, where it’s appropriate, at some of the larger, priority sites, but the majority of recording is being done by the volunteers themselves using handheld digital cameras. That could be perceived by some as a dangerous direction to go, but I’m placing great emphasis on providing training, to make sure the volunteers are aware of what they can or should do with the cameras, how the imagery can then be processed in modern photogrammetric packages like PI-3000 from Topcon, and what level of data can be generated by this lower-cost approach. For the basic recording of up to two thousand rock art sites, this is perceived as an effective and appropriate approach.

Levin: *I’d like to address the integration of documentation activity into the conservation process. How well is that being done now? What are the problems with it?*

Bryan: I have been involved in a number of conservation projects that, in my opinion, have been very successful. One in particular was the documentation of the great medieval nave ceiling at Peterborough Cathedral, where, from the outset, there was communication among all the people involved in the documentation aspects of the project—conservators, archaeologists, architects, analysts, and surveyors. Regular meetings took place, so that any concerns could be fully discussed. Communication within projects is what I would emphasize most. I’ve been involved in projects that haven’t gone so well, and that tends to be because people have not been consulted.

Schmid: One of the huge potentials that new information technologies and information management tools offer us is a better way to communicate and share our results. That means establishing

project-based Internet or Intranet sites. This really helps to integrate documentation into the conservation process by making the information available online to all who are authorized to receive it.

Eppich: *Some people don’t know exactly what products some of these documentation methods will provide. Do you think you have to manage expectations too?*

Bryan: I could go back to a word that I used—*successful*. I said that the Peterborough Cathedral documentation was successful. That’s my perception of it. However, how do you gauge whether documentation has been both successful and effective? It’s really the people who manage the projects that need to make that judgment.

Schmid: Multidisciplinary cooperation in conservation projects is an old idea, but it rarely really works. For me, what often happens is that everybody documents their proper part of the project, but there’s rarely an integration or correlation of data, a real interdisciplinary exchange and evaluation, which is, from a conservation point of view, an absolute requirement for a successful project.

Addison: Communication is key. I would say that communication has three phases. First, communication before you start, so that the needs are really understood. Second, communication during. This is a ripe area for the technology developers—for example, finding a way for the surveyor to communicate his data to the photographer while capturing it, or for the photographer to link what he’s capturing to the archaeologist, so that in the field or during the recording process, there is communication among all players. Finally, after the recording is done, there needs to be an information management system. In many projects there are nascent information management systems, but I look forward to the day when there is a global database of all projects that can be cross-referenced and cross-indexed so that multiple people can share and communicate their results together in a global archive that will have longevity beyond individual project lives.

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Levin: *What I hear all of you saying is that while documentation is a field that relies a good deal on technology and equipment, what matters is the human quality and guidelines, which are not tool based. Communication, integration, the multidisciplinary approach—these seem to be the themes of this conversation. Whether you're working in a country that has access to everything or working in one that only has the most basic tools, you can fail in both places or succeed in both places. In either instance, you need guidelines that are understood and followed, and good communication from the beginning of a project among all members of the team.*

Bryan: Yes, definitely. For example, the data is dependent upon the quality fed into it. Of course, only people can make the judgment that it's good quality or not. In ten or twenty years, the tools that the documenter uses will undoubtedly increase in speed, use 3-D more, and some may even become automated. However, the process will still be based on human involvement in data gathering and input.

Levin: *You're saying that in the future, if the documentation itself is to be better, it will be because communication and guidelines are better.*

Addison: I would like to see the cultural heritage and natural heritage communities united on some guidelines. It would be great to communicate to the makers of digital tools—be they digital camera or laser scanner manufacturers—our needs as a community. They either aren't aware of what is needed to make their data useful in the future or they don't have time, or it's not easy. One thing that is easy is making it simpler for people to put the metadata onto things so that it can be used and communicated down the road. If manufacturers were approached in a united way and told, "look, these things would be useful," it's quite easy to add a couple of extra fields to the collecting device's format, which databases from yet other manufacturers could take advantage of.

Bryan: We've mentioned the word *metadata*. But how many people have actually started using metadata in the sense that it is designed for? In my organization, English Heritage, we've realized that metadata is the crucial element that will make archiving and accessibility to digital imagery possible. As part of this, we've recently been asked to caption every digital image taken, although our initial thought was, that's going to be an enormous amount of work. However, within the latest releases of software such as Adobe Photoshop, the leading image manipulation package, you've now got all the tools together in one box for generating captions and other metadata for digital images, prior to archiving.

Eppich: *Is it a problem to communicate during a project? In projects that I've worked on, if I send any data during, it sometimes creates problems because it's not finished, and people make judgments on it before I've included certain aspects.*

Addison: It's very tricky because if you try to share outside the field, you have problems from those back in the office saying, well, that doesn't look complete. But even in the field it's challenging, because there is a lot of information that's needed and that people want. There's an enormous amount of communication that needs to happen in the field.

Levin: *What about the potential for taking the data that is collected, and manipulating it in new and different ways that provide additional insight into the problems and the solutions that might be involved in the conservation project?*

Addison: There are wonderful modeling systems, but again, I think it's not as much the technology as the people. It really comes down to the people and the knowledge of the professionals and how much of that gets there. We can get more and more photorealistic reconstruction, but more important is explaining the basis of the interpretation. What typically seems missing from these interpretations is documentation of the documentation—an explanation of how they got to this conclusion. It's not as much the technology—it's down to us, the people, informing, marking, and explaining everything we do so that someone can understand it at a later stage.

Schmid: From my experience, to get to real, significant results in investigation projects requires the correlation of too many different parameters—partly scientific, partly technical or graphical or whatever. A computer cannot do the same job as a human mind in these cases. A computer might help, but in the end, to really make a good interpretation means to integrate and consider so many different parameters from so many different areas of expertise. At the moment, a computer is unable to do that.

Addison: Professionals as well as laypeople would be more than happy to provide more data. It just needs to be easier. We're advancing, but we haven't advanced in the ability to easily add this metadata and explain what we're doing. That's the next phase for the technology. From a technological point of view, I think it could easily happen. The cultural heritage community needs to communicate to the manufacturers what we need.

Eppich: *Don't you think that it's easy now? You just have to sit down at a computer. From my own experience, I see the issue as enforcement. How do you make people add the metadata?*

Addison: You can sit down at a computer today, and in a batch mode name all your photos from a project. But that's not easy enough for most people. Most people will put a descriptor on data in the field while they're recording it if given an easy way. But once they get home, they have so many images sitting on the computer that they don't get around to it. We need to make it easier. And we need to have the ability in the field.

Schmid: I have worked for some years on a conservation project of an early medieval church in the Roman Forum. It was excavated in 1900, and we have excellent black-and-white photographs from then that are extremely important references for us. But I am very worried about the long-term preservation and accessibility of our digital data. I don't think that archives and heritage agencies are prepared, at least in Italy, for the active maintenance that must be guaranteed. We already have some examples of digital documentation of wall painting conservation projects—now digital garbage—produced in the late 1980s with a huge amount of money and effort.

Addison: It's an enormous problem. Some of the first-generation laser scanner companies, for example, no longer exist, and you've got data in a proprietary format. Assuming that you can find data on the medium—disk, tape, et cetera—that is still readable, how do you open that data? And assuming you can get it off the medium, in what format is it? Is it understandable? With enough time and money, a programmer can probably decode it, but at an unrealistic cost. And, as Werner said, old photographic archives have more longevity today than most digital data.

Levin: *This, of course, is an enormous issue that affects a variety of fields across the board, not simply documentation.*

Addison: It impacts libraries and museums. I'm sure everyone in the cultural heritage community is thinking about it, but it's just sitting there, a looming, growing problem.

Schmid: Producing documentation that hopefully will still be accessible in one hundred years' time or more.

Addison: Yes. We started with the premise that one of the reasons we're documenting is to preserve the historic record.

Levin: *What can the field do to protect this information, at least for the moment, since there is no immediate solution to the problem of long-term storage of digital information?*

Bryan: As Alonzo suggested, representatives of the cultural heritage community need to encourage manufacturers' development to make sure our heritage requirements are considered at an early stage. Some of the manufacturers perceive cultural heritage as an interesting application, but because it tends not to have as much money associated with it as other applications might enjoy, it doesn't drive their development. Another issue my organization is starting to understand is how can we archive digital data properly? In the United Kingdom, there's an organization called the Archaeology Data Service that is taking the lead in developing ways of archiving digital data related to archaeological projects. They typically receive documentation data on a CD, download it onto a hard disk and then dispose of the original CD, as they say the modern hard disk is an easier way to manage, update, and back up the data. We haven't yet come up with a solution on how to archive laser-scanned data, but we've got projects, like Heritage3D, that are currently looking into this. I'm sure solutions will come along, but we need to communicate and disseminate them to make sure that when people are putting a project together, they consider the archive issue—the archive tends to be at the very end of a project, so it tends not to get much initial thought—to ensure that the products of documentation are usable in twenty to fifty years' time. This must be a priority in project planning.

Addison: I'm currently working on an initiative to address this. If we just rely on the technology developers to come up with something, that won't be enough. Working with UNESCO on redoing their information systems has made it apparent that there needs to be a shared global archive. The only real solution is to use the power of the Internet and large-scale databases to make some sort of communal archive where the costs of data upgrading and maintenance can be shared. People are told that CDs will last thirty years, so they think they're safe. But there's much more to it than that. The only way is to band together.

Protecting Iraq's Sites and Monuments

Support for a Nation's Keepers of Cultural Heritage

By Neville Agnew and Gaetano Palumbo

Temple facade at the ancient site of Umma (Tell Jokha) in southern Iraq, destroyed by looters looking for inscribed bricks. Since spring 2003, hundreds of thousands of cultural artifacts have been removed from archaeological sites throughout Iraq. Photo: Joanne Farchakh-Bajjal.

THE ARCHAEOLOGICAL RECORD FOUND IN IRAQ is one of the most important, complex, and hitherto complete repositories in the world, stretching back into deep antiquity. A number of the world's early civilizations arose in this land, once known as Mesopotamia, and the remains of those and of later human settlements cover the landscape.

That heritage is at risk. Donny George, current chairman of Iraq's State Board of Antiquities and Heritage (SBAH), stated in *Newsweek* in March 2005 that there are around eleven thousand registered sites in the country and that many thousands of objects were removed from those sites between 1991 and 2005 (but especially after the war of March 2003), without any possibility of their being recorded or of anyone's knowing what was illegally exported. Former Coalition Provisional Authority official John Russell, writing in 2005 in *Architectural Record*, estimated that some 400,000 to 600,000 cultural artifacts have been removed from these sites since spring 2003.

It is safe to assume that many previously unknown or unexplored sites are being looted as well. Destruction of these sites through theft eliminates the archaeological record, making it impossible to know what information and knowledge of early civilizations has been lost. While items stolen from museums can be identified—thanks to existing records and documentation shared with organizations such as Interpol and ICOM—those taken illicitly from sites have no record and are degraded in cultural information. These losses continue.

With so much attention naturally focused on the continuing tragedy of violence in Iraq, it is easy to forget that preceding the wars of 1991 and 2003 was the drawn out Iran-Iraq War (1980–1988). Throughout all of these events, SBAH functioned heroically





Above: Donny George (center), chairman of Iraq's State Board of Antiquities and Heritage (SBAH), along with Burhan Shakir (right), director general of excavations at SBAH, and Ihsan Fethi (left), dean of the Faculty of Arts at Amman University, at a meeting at UNESCO to discuss plans for the fall 2005 training course of the GCI-WMF Iraq Cultural Heritage Conservation Initiative. *Photo:* Mario Santana Quintero/GCI-WMF Iraq Cultural Heritage Conservation Initiative.



Right: At the fall 2005 training course in Amman, Jordan, instructors and SBAH participants discuss forms to be used for the rapid assessment of cultural heritage sites in Iraq. Data from the forms will be compiled in the Iraq Cultural Heritage Sites GIS Database. *Photo:* Rand Eppich.

but with ever-diminishing funding and staffing and, in many cases, without the ability to assess damage to sites or to implement protective measures. With regard to preserving cultural heritage in Iraq, one of the great needs is to rebuild the SBAH's professional capacity, which has been depleted by years of isolation and war.

Graphic images of the looted Iraq Museum in Baghdad prompted the international community to provide support and expertise to the Iraqi authorities, including the SBAH. UNESCO acted quickly after the outbreak of hostilities to convene meetings and to draw up an international coordinating committee for Iraq. While recognizing that protection and rehabilitation are long-term processes in the best of circumstances, since April 2003, UNESCO has endeavored to assess conditions and to develop an overall strategy to protect Iraq's cultural heritage. The UNESCO report on the inspection of sites in Iraq, undertaken in May 2003 under the direction of Mounir Bouchenaki, identified four types of damage to archaeological sites as a result of wars, sanctions, and the collapse of infrastructure: looting, military bases, accelerated decay, and questionable reconstruction methods at sites such as Babylon in the 1980s.

The GCI-WMF Initiative

The Getty Conservation Institute, in conjunction with the World Monuments Fund (WMF), decided to develop a major initiative to help rebuild the professional expertise and heritage infrastructure in Iraq. The GCI-WMF Iraq Cultural Heritage Conservation Initiative is the first time that the two organizations have formally worked together.

After examining the urgent needs in Iraq and how to best use the two organizations' resources—and considering their in-house staff expertise—the GCI and WMF opted for an effort focused on immovable heritage: archaeological sites and monuments. Because of the continuing security concerns and the impossibility of intervening directly in sites and monuments in Iraq, the decision was made to assist the SBAH in rebuilding its professional capacity and to help the organization procure technical equipment. The GCI-WMF initiative is designed to aid in that rebuilding process by providing training in tools and methodologies that can aid in archaeological site documentation, site assessment, and site management.

One important aspect of rebuilding SBAH's professional capacity is the development of a national database of heritage sites in Iraq. The GCI and WMF are working with the SBAH on the creation of the Iraq Cultural Heritage Sites Geographic Information System (GIS) Database, currently in development through an agreement with Arizona State University. The bilingual Arabic and English GIS database (scheduled for installation in Baghdad in 2006) will be a significant cultural resource management tool. When fully devel-

oped, it will provide a national inventory of Iraqi archaeological sites and monuments. With the database, SBAH authorities will be able to monitor development activities in areas of potential impact and to coordinate measures with other governmental agencies to reduce threats to the integrity of sites and buildings. This tool will also provide the SBAH with the capability to conduct various database queries, as well as a number of geographic analysis functions.

The initiative's first major training program for SBAH staff was conducted in Amman, Jordan (see *Conservation*, vol. 20, no. 1), in late 2004. This one-month program for sixteen SBAH participants focused on acquiring a methodology for the rapid assessment of archaeological sites and historic buildings and the use of the Iraq Cultural Heritage Sites GIS Database. The rapid site assessment methodology taught to SBAH officials will yield critical information on the current status and condition of sites and monuments in the aftermath of war and continued looting. The course also provided training in the use of documentation recording equipment (some of which was purchased for the SBAH by UNESCO), including Global Positioning System (GPS) units, total survey stations, digital cameras, and laser distance meters.

During the first half of 2005, the GCI-WMF initiative held three short-term training activities for SBAH personnel. These included a one-week GPS course in April in Amman, a two-week program on the rapid assessment methodology and recording tools for SBAH personnel from Babylon, held at the British Museum (with support from UNESCO and the involvement of University College London), and a ten-day metric survey course in June in Amman, taught by specialists from English Heritage and Leica Geosystems.

In August and September 2005, the GCI-WMF initiative conducted an additional monthlong training program in Jordan for twenty-one SBAH personnel, including the directors of the SBAH offices from the governorates of Babylon, Basra, Kirkuk, and Nineveh. The course included modules on the rapid site assessment methodology and the use of site recording tools; it also focused on site condition assessment and recording, international heritage conventions, charters and organizations, and site management planning.

In addition to this training, since fall 2004, the GCI-WMF initiative has been supporting English-language classes in Iraq for SBAH personnel who are participating in the initiative's courses.

The training activities have been conducted with SBAH staff—with various professional backgrounds from most regions of the country—who have displayed an eagerness for information on equipment and techniques to which they have not previously had access. And as often happens in these kinds of circumstances, teaching has not been one sided. SBAH staff have had much to share with their instructors. At the same time, in the process of identifying needs, preparing course contents, and fine-tuning the database, the

assistance of SBAH directors—from its chairman to the directors of the excavation, conservation, and architectural heritage sections—has been essential to the program's success.

The support of the organizations and individuals joining with the GCI-WMF initiative has also been considerable (see sidebar). Among them are the Jordanian Department of Antiquities. When its director general, Fawwaz al-Khraysheh, was asked whether the resources of the department could be used to support the training initiatives, his reply was, "We must help our Iraqi brothers." Not only have facilities been made available but there have also been generous contributions from Jordan in staff, lectures, logistical support, and access to sites as training venues.

While it would be desirable to conduct training initiatives in Baghdad or elsewhere in Iraq, the security situation remains dangerous. With easy access to Amman and with good facilities available at the American Center of Oriental Research, the training has been



Training course participants assess conditions at the Bronze and Iron Ages archaeological site of Tall Al-Umayri, Jordan. *Photo: David Myers.*

A course participant from the SBAH practices using a global positioning system unit during the training course. *Photo: Rand Eppich.*



**Institutions
Supporting the
GCI-WMF Iraq
Cultural Heritage
Conservation
Initiative**

UNESCO

funding for training and equipment

Jordanian Department of Antiquities

hosting and supporting coordinating activities in Jordan; training support

American Center of Oriental Research

hosting and coordinating activities in Jordan

English Heritage

training support

J. M. Kaplan Fund

funding general initiative activities

U.S. National Endowment for the Humanities

funding database development

U.S. National Park Service

training support

Environmental Systems Research Institute

software donations

efficient and effective and is fully backed by SBAH's chairman Donny George and his staff. The initiative is also fortunate in having the participation of several expatriate Iraqi professionals who are working closely with GCI-WMF staff and consultants.

Priorities in Iraq

The seriousness of conditions in Iraq prompted the World Monuments Fund, for the first time, to put an entire country on its biannual list of the One Hundred Most Endangered Sites. In *Heritage at Risk, ICOMOS World Report for 2004/2005 on Monuments and Sites in Danger*, Ihsan Fethi—one of the instructors with the GCI-WMF initiative—wrote that the scale of the loss and destruction of Iraqi cultural heritage has been incomprehensibly large, and that most of it could have been avoided.

Fethi gives priority to a number of measures, including:

- new policies and strategies with an integrated protective system;
- new physical planning policies and development plans for all urban centers, towns, and villages, using GIS techniques, to ensure the conservation of the remaining historic fabric;
- promulgation of new and more stringent laws to halt further losses or encroachment;
- preparation of a national register of cultural heritage, including the designation of historic areas, areas of outstanding natural beauty, and classification of all buildings and monuments, according to their architectural or historic interest; and
- initiation of a national program for the protection and restoration, and even reconstruction, of lost monuments.

This is an ambitious checklist, to which might be added a revision of university heritage planning and management curricula, and the integration of archaeology, conservation, and management. Officials at the SBAH, who have had the challenge of protecting a formidable cultural heritage under extreme and dangerous conditions, share many of these concerns.

The GCI-WMF initiative is an effort to assist the Iraqi professionals who would carry out these measures. By helping these professionals identify and address Iraq's archaeological and architectural site conservation needs and priorities and by providing education, training, and capacity-building programs, the initiative hopes that the SBAH will ultimately have available the long-term tools and professional capabilities necessary to regain stewardship of Iraq's archaeological and architectural sites. Other organizations, including the Japanese and Italian cooperation agencies, the Islamic Educational, Scientific, and Cultural Organization (ISESCO), and the Nordic World Heritage Foundation are also implementing assistance and training courses, many of which are taking place in Jordan with the help of Jordanian institutions.

There is still hope that the future of Iraq's past can be secured. At the moment, the urgent need remains to help Iraqi professionals and heritage officials to halt the continuing damage and hemorrhaging of antiquities from looted sites, and to assist them in rejoining the international heritage community.

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From Silk Road to Digital Domain

Managing Information for a Wall Paintings Conservation Project

By Lorinda Wong



Three-dimensional small-scale model of the interior of Cave 85, with overlaid line drawings of the paintings and graphic condition documentation. Condition mapping of this kind helped project members to visualize and understand patterns of deterioration throughout the cave. *Photo: Lorinda Wong. Model fabrication: Rick Miller.*

HOW DOES A CONSERVATION PROJECT that spans many years and involves numerous experts from various disciplines manage all the data a project of this scale inevitably generates? A collaboration between the Getty Conservation Institute and the Dunhuang Academy provides insight into the complexity of the issues of information management, illustrating problems, as well as some solutions.

Since 1997 the two institutions have worked together to conserve the wall paintings in Cave 85 of the Mogao Grottoes, a Buddhist cave temple site situated along the ancient Silk Road in northwestern China (see *Conservation*, vol. 14, no. 2). The goal of the project is to identify and understand the causes and mechanisms of deterioration of the wall paintings and to design strategies and implement conservation actions that can preserve the paintings.

The eight-year project has involved experts from many fields, including wall paintings conservators, environmental scientists, analytical chemists, geologists, and art historians. Each of these disciplines has generated vast amounts of information. As a result, methods of information management—the collection, organization, storage, retrieval, integration, manipulation, and presentation of multidisciplinary data—developed out of necessity and grew into an important component of the project. The challenge was to establish a data management system that would work across disciplines, facilitating access to project information by team members and thereby

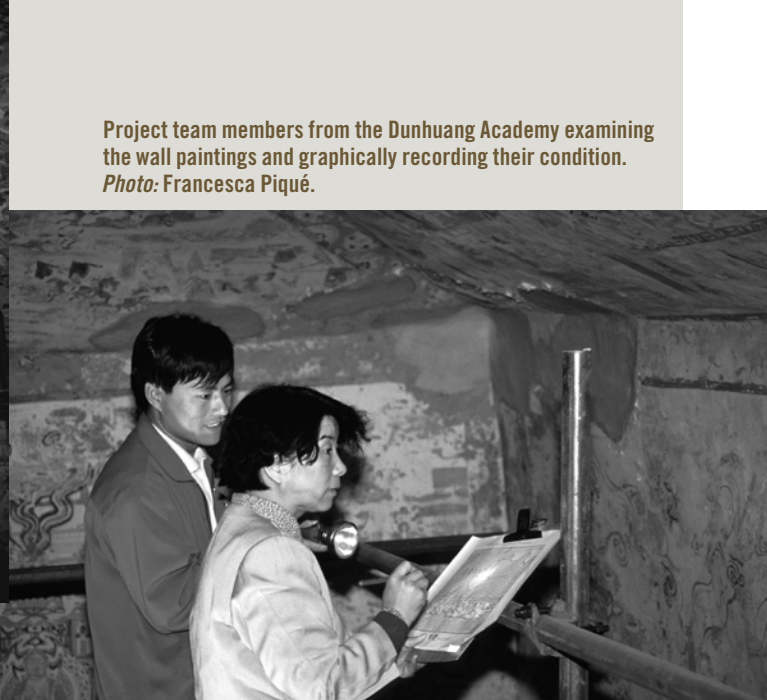
promoting the integration and use of multidisciplinary data, which was essential in guiding the project's work.

Information management has become an increasingly important topic in recent years—the subject of conferences and colloquia, including the 2005 American Institute for Conservation annual meeting, “The Documentation Dilemma: Managing Conservation Data in the 21st Century”—mainly because of the growing role of information management, the introduction and wide acceptance of digital photography, and the continued dependence on computers in conservation. Information management has become a discipline in itself within the conservation field. No longer just about file naming and organization, it also includes the thoughtful storing of data that not only involves file retrieval but also offers the ability to query data and to promote the use and integration of this information. Different types of databases are being developed for the field. Marketed as easy to use, databases facilitate data entry, aid in the organization and storage of digital files and images, and even generate ready-formatted reports at the press of a button.

However, one cannot overlook the human role in this process. Nor can we ignore the issues of long-term preservation of digital technologies as we continue to generate increasingly larger amounts of digital data. We need to ensure not only that our software and files are continually updated but also that the systems with which we store information are equally secure. At present, there are no easy solutions.



Conservators at work on the upper scaffolding lift in Cave 85.
Photo: Neville Agnew.



Project team members from the Dunhuang Academy examining the wall paintings and graphically recording their condition.
Photo: Francesca Piqué.

Types of Data

The Cave 85 project data are vast and varied. Initial information gathering resulted in:

- a project bibliography in hard copy and electronic form;
- collection of information (such as geological and hydrological data) that might contribute to an understanding of the deterioration found throughout the site;
- art-historical information on the iconography of the late Tang dynasty wall paintings and sculptures;
- historical photographs and archival material that reconstruct the physical history of Cave 85 and help in the understanding of the site's history and deterioration; and
- conservation history to understand previous interventions in Cave 85, as well as general conservation practices at the Mogao Grottoes.

Condition recording was undertaken to understand the causes and mechanisms of deterioration of the wall paintings. Recording included a comprehensive photographic survey, an illustrated glossary of condition terms, graphic documentation to map types and distribution of deterioration in the cave, and written reports. The analytical investigation studied the original materials and techniques of the wall paintings, as well as the causes and mechanisms of salt-driven deterioration—in particular, the detachment of the painted plaster, the most serious wall paintings problem in Cave 85. Both noninvasive examination and invasive sampling generated scientific reports and image files and significant amounts of raw data from an array of analytical instrumentation. An environmental investigation monitored the interior microclimate and the exterior climate for the entire length of the project. With individual probes collecting measurements every fifteen minutes, the amount of environmental data gathered is immense.

As part of testing and development of conservation interventions, laboratory and in situ testing were thoroughly documented. These efforts included the comprehensive research and testing of grout formulations for use in treating the detached painted plaster in Cave 85—over eighty different grout formulations were subjected to a rigorous series of tests. The actual treatment was also fully documented. With individual conservation interventions almost complete, final postconservation documentation will now be undertaken.

Added to all this information is the ever-growing collection of digital images. Straddling the divide between analog and digital technology, the project for the first five years relied on traditional photography, while work since 2003 has been almost exclusively digital. As a result, the amount of electronic data jumped from five gigabytes in 2003 to over twenty-five gigabytes in 2005. This leap is due almost entirely to the storage of digital images, but it also includes thousands of files in various formats: text, data, photography, video, graphic presentation, and drawings.

Information—in English and Chinese—is generated by staff at both the GCI and the Dunhuang Academy, as well as by outside consultants. This accumulation is very much a live body of data. It is constantly evolving as information is updated and altered. The structure and organization of the information are modified as the project develops.

Problems and Solutions

With so much information being generated, it became increasingly difficult to retrieve files in a timely manner. In a multiyear project of this nature, with multiple users involved, from different fields, on multiple continents—and with data being produced in two languages—it is difficult to track who did what when and where it

can be found. The absence of a standardized file naming practice exacerbated the problems, as did the lack of centralized storage of files and the lack of an agreed-upon file organizational structure. Files were often kept on personal computers. Multiple versions of a single file were generated, without indication of when it was modified or by whom. These circumstances led to poor communication among project team members and caused much time to be wasted in locating files and determining their most current versions.

The decision to focus attention on information management came late, midway through the project. What was to be done with all of this data?

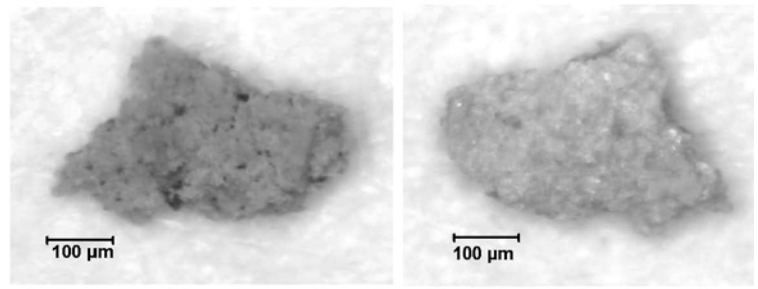
The goal in managing the Cave 85 information was not to develop new ways of dealing with data. Rather, it was to manage the data in a simple, organized, efficient, and effective manner that would transcend inevitable developments in software and technology. We simply aimed to collect, organize, and store information in a way that would promote its use during the project. In other words, we focused on the working data rather than on the future archiving of project information, an area that will need to be addressed following the project's completion.

A protocol for receiving, storing, and sharing information became the answer. The key to its implementation is best described as a low-tech solution—the appointment of an information manager, through whom all information now flows.

Ideally the information manager is a person with a solid understanding of the project, of the different types of information generated, and of the structure of the project. In the Cave 85 project, the information manager works closely with project team members on:

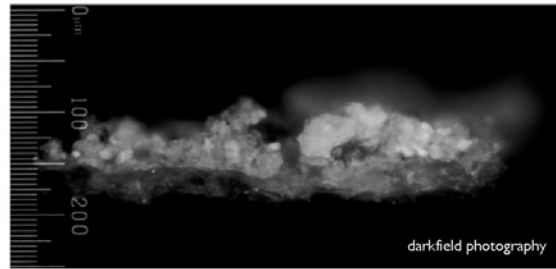
- **data collection:** receiving and monitoring all data from project team members;
- **file naming:** renaming files following an agreed-upon convention (including a brief description of the content, metadata on the author, creation date, and file type);
- **storage:** storing each file in its appropriate place on a shared folder—and not on personal computers (the shared folder is a secure, networked location that allows access to all project members);
- **data sharing:** communicating receipt and availability of project information to appropriate team members, including the creation of a parallel database and the identification of an information manager in China to allow for the exchange of critical documents between project partners;
- **retrieval:** locating files and helping direct team members to relevant information; and
- **maintenance:** maintaining and reorganizing the shared folder and keeping information current.

Examination (WILD M8 low-power examination microscope):

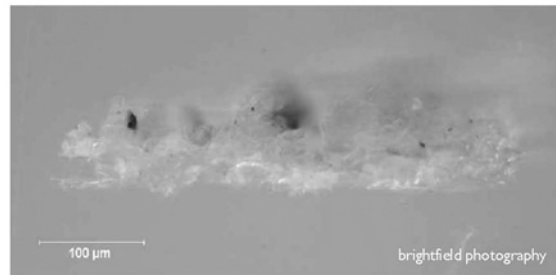


Sample contains coarsely ground green paint layer and ground layer. Flecks of colored particles are visible within the paint layer.

Cross-section investigation

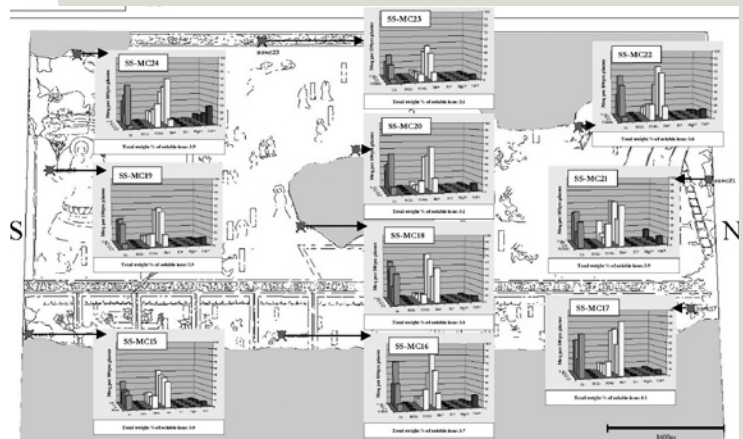


Stratigraphy
Layer 1. Paint Layer
 50 microns in thickness
 Individual green pigment particles measure 15-20 microns
Layer 2. Ground
 Only a portion of the ground is contained in this sample



Page from a sample report used to share information among project team members.

A visual display of salt survey results from the west wall of Cave 85. The survey established the distribution of soluble salts throughout the cave at four incremental depths into the surface of the plaster. The pattern of deterioration directly correlates with survey results that show a higher salt content in the plaster toward the west end of the cave.



Information management is not the job of the information manager alone but is also the responsibility of every team member. The system requires continuous attention and maintenance and relies heavily on human accuracy and commitment. It only works if the entire team practices great discipline.

Integration, Manipulation, and Presentation

Accessible data alone does not move a project forward. Interpretation demands a complete view of the data. To understand the whole story, the data must be integrated, with trends discovered by one discipline informing the picture formed by other disciplines. The thoughtful integration of multidisciplinary data and subsequent interpretation by the project team help guide decision making.

To provide meaning and context, data may also need to be manipulated and visually presented. It is hard to discern trends from raw data produced by analytical and environmental investigations, let alone use it for deriving conclusions. There is a need to visually display these types of data in a significant, meaningful, and understandable manner to aid in its interpretation. For instance, scientific data generated from the comprehensive sampling investigation was placed in individual sample reports created by both the conservation and the analytical teams. Each report is a document containing all information related to a single sample. This report includes description of the sample, sample location, sampling rationale, and results of analytical investigation. Sample reports were placed in the shared folder so that the scientific and conservation teams could easily share information.

As an example of the integration and visual presentation of data, the diagnostic initiative included investigation into salts as the main cause of deterioration in Cave 85. As part of this inquiry, a comprehensive salt survey was undertaken, in which tiny microcores of plaster were carefully carved out of the upper ten millimeters of plaster at selected locations throughout the cave—areas where there were already losses of the paint layer. Forty-seven microcores were taken, each at four or five incremental depths into the painting strata, resulting in nearly two hundred samples. The

microcores were then analyzed to identify the presence of soluble ions of salts, as well as to assess their distribution. The results were not easily recognized. Instead, the data was visually presented topographically to correlate analytical with conservation data. The locations of the microcores were superimposed over the condition recordings, which were in the form of CAD drawings showing areas of loss of the painted plaster. Each microcore was correlated with a data table showing the main soluble ions divided by incremental depth. This type of plotting, which was done for all areas, clearly revealed the enrichment of salts toward the west end of the cave, in comparison to the east end. The visual display established a direct correlation between the salt content of the plaster and the condition of the wall paintings.

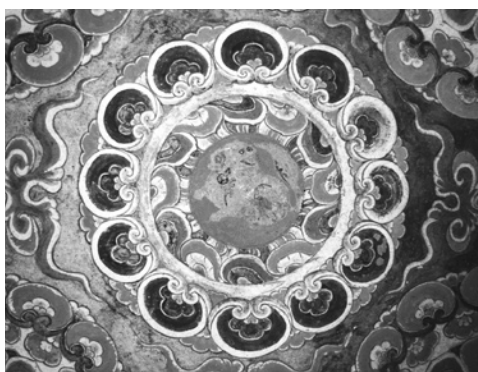
What Was Learned

In the context of the Cave 85 project—most known for its project methodology, scientific research, environmental control measures, and development and application of innovative conservation treatment—information management has been demonstrated to be an integral and essential component of the conservation process.

An important lesson learned from the project is that information management needs to be integrated into the conservation process from start to finish, with commitment from the entire project team. An information management plan from the beginning of the project would have supported the allocation of appropriate resources and time throughout the course of the work. As a result of the late start and an initial hesitation in dedicating the necessary resources to managing information, there was little time for cleaning up existing data or for exercising tighter control in the collection of incoming information. The eventual archiving of project data—which will involve distinguishing essential from nonessential project information for the future—therefore remains a big task. The tardy start also prevented pursuit of information management tools that, in hindsight, would have been advantageous, such as using a searchable database for entering the results of the analytical investigation.

However, it is never too late to begin to manage project information. The management of information during the last half of the Cave 85 project happened during a crucial period of multidisciplinary research and investigation, testing and development, and implementation of conservation work. The relatively simple solutions of naming an information manager and of instituting a data protocol proved effective for facilitating data exchange and for promoting the use of information among professionals from different fields—essential components for moving the project forward.

Lorinda Wong is an associate project specialist with the GCI and the information manager for the project in Cave 85.



The central ceiling panel of Cave 85, showing a lion surrounded by decorative lotus patterns. Photo: Francesca Piqué.

Los Angeles City Council Authorizes Survey

In August 2005, the Los Angeles City Council authorized the first comprehensive citywide historic resources survey of Los Angeles and authorized the city to negotiate and enter into an agreement with the J. Paul Getty Trust for grant support and professional assistance for the survey. The Getty Foundation will provide a matching grant of up to \$2.5 million over five years to the City of Los Angeles to underwrite a portion of the operating and development expenses and field survey costs. The Getty Conservation Institute will provide consulting, research, and publication assistance for the survey.

This authorization and agreement are the culmination of two years of research and collaboration between the City of Los Angeles and the GCI's Los Angeles Historic Resources Survey project (LAHRS).

The city's Office of Historic Resources, in the Department of City Planning, will be responsible for directing the citywide survey. The survey data can be used to guide future preservation efforts, including neighborhood conservation, the adaptive reuse and rehabilitation of historic buildings, and new-project planning. Importantly, historic resource information will be integrated with other municipally maintained property information and can be publicly accessed through the city's powerful geographic information system (GIS)-based Zoning Information and Map Access System (ZIMAS), located on the Web

at zimas.lacity.org/.

The GCI will assist the city with the preparation of a citywide historic context statement, survey standards and practices, and enhancements to historic resource data and communication systems. The first two years of the project will be focused on developing survey systems and protocols, testing survey methods, and evaluating the process through pilot surveys, while the final three years will be devoted to the collection and organization of information. Cornerstones of the survey will include clear standards and criteria for the evaluation of historic resources and significant involvement from property owners and community groups.

The work of the LAHRS project has included assessment of the purpose and value of a citywide historic resource survey and publication of the guidebook *Incentives for the Preservation and Rehabilitation of Historic Homes in the City of Los Angeles*, to assist homeowners and prospective owners of older properties in Los Angeles to identify financial, tax, and regulatory incentives of benefit to them. The assessment report and guidebook are available in PDF format on the Getty's Web site at www.getty.edu/conservation/publications/pdf_publications/reports.html.

For additional information on survey research and findings, visit www.getty.edu/conservation/field_projects/lasurvey/index.html.

Integrated Emergency Management Course

The Getty Conservation Institute has partnered with the International Council of Museums (ICOM) and ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) to offer a pilot training course on risk assessment and emergency preparedness for museum personnel in Asia. This training initiative is part of the Museums Emergency Program Education Initiative, carried out within the broader framework of ICOM's Museums Emergency Program (MEP) project.

The eight-month course, Teamwork for Integrated Emergency Management, was launched in August 2005 with a workshop in Bangkok, Thailand. Participating in the training are teams from eight national museums and two graduate museum studies programs, including the National Museum of Cambodia, Phnom Penh; the National Museum of Mankind, Bhopal, India; the National Museum of Ethnology, Osaka, Japan; the National Museum of Korea, Seoul; the Colombo National Museum, Colombo, Sri Lanka; the National Museum of the Philippines, Manila; University of the Philippines Diliman, Quezon City; the National Museum, Bangkok; the Vietnam Museum of Ethnology, Hanoi; and the Ha Noi University of Culture, Hanoi. In addition, representatives from the Canadian Conservation Institute and the Art Gallery of Hamilton in Ontario, Canada, are participating in the course to study the

feasibility of adapting this training for Canadian museums. The course benefited from the considerable support of the Fine Arts Department, which is within Thailand's Ministry of Culture.

The two-week August workshop prepared participants to understand and assess risks, to plan for emergency situations, and to implement mitigation measures for both museum buildings and collections.

The second phase of the training, currently in progress, involves distance mentoring. During this phase, course participants will follow a program of practical work at their respective institutions that will take them through the process of conducting a museum risk assessment and through the basic steps of creating an emergency plan. The final phase will be a meeting in the second quarter of 2006 to review the progress made by participating institutions.

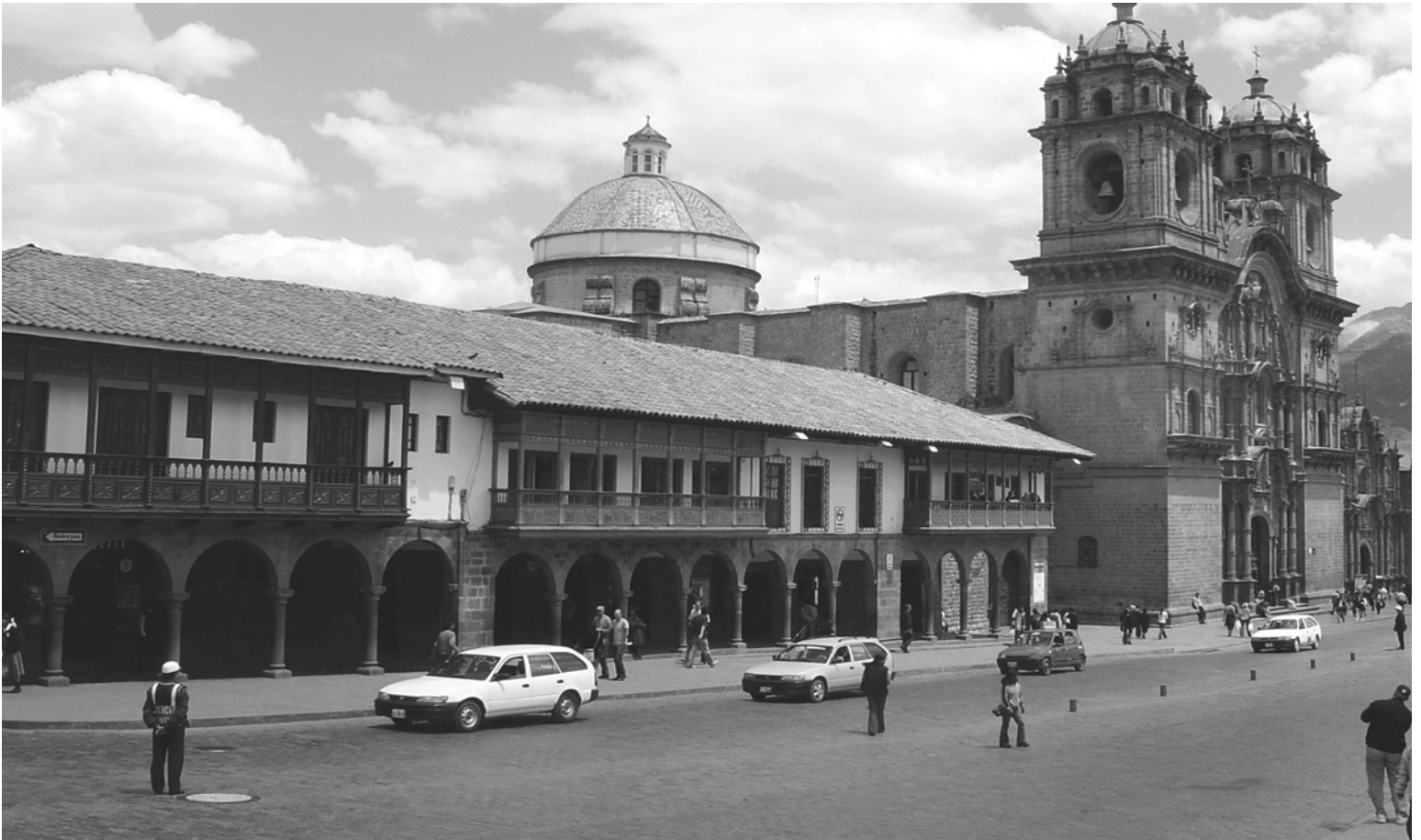
The aim of the Museums Emergency Program Education Initiative is the protection of cultural heritage through the enhanced capacity of museum and other heritage professionals in the area of integrated emergency management. The initiative has created a searchable bibliography on emergency preparedness accessible through the Getty's Web site at gcibibs.getty.edu/asp/.

For information about other activities associated with the Museums Emergency Program, visit ICOM's Web site at icom.museum/mep.html.

World Heritage Cities Symposium

The Getty Conservation Institute collaborated with the Organization of World Heritage Cities (OWHC) on its eighth biennial symposium, "Heritage of Humanity, A Heritage with Humanity," held in September 2005 in Cuzco, Peru. The GCI developed the symposium's scientific sessions and a one-day presymposium workshop on heritage preservation for newly elected mayors and newly appointed decision makers of World Heritage Cities. The symposium was attended by five hundred participants, including approximately seventy mayors of World Heritage cities. In addition, more than six hundred local university students participated via a live video feed.

The presymposium workshop began with brief presentations that addressed issues relevant to newly installed mayors: Why should a mayor be concerned with cultural heritage conservation? What are a mayor's responsibilities vis-à-vis cultural heritage? Where can a mayor find practical solutions for common problems? By posing these questions, the workshop intended to underscore the relationship between conservation principles and action.



View of La Compañía de Jesús church in the Plaza de Armas, Cuzco, Peru. *Photo: François LeBlanc.*

The second part of the workshop focused on the mayors' own experiences concerning cultural heritage protection and concluded with a case study site in Cuzco. In discussing how *Cusqueños* address social and conservation issues, mayors learned more about the questions posed earlier in the day, and they became familiar with some of the conservation issues facing the city.

The scientific sessions generated extensive discussion among participants, which was achieved through a unique symposium format. Guest speakers presented participants with the three topics:

- citizen participation in the revitalization of World Heritage Cities—successes and failures;
- intangible heritage in a World Heritage City—identifying and supporting it; and
- hosting tourists in World Heritage Cities—how to reconcile the needs of the residents.

After topics were introduced, participants were divided into working groups based on the symposium's official languages—English, French, and Spanish—to facilitate discussion. While in these small groups, participants were presented with two case studies on each of the topics—one from the perspective of a World Heritage City mayor and the second from the perspective of a conservation professional. Participants then engaged in a rigorous discussion of the issues raised in the case studies.

Rapporteurs gathered the extensive comments from each of these small group sessions and, at the symposium's conclusion, presented concise analysis of the ideas expressed. Additionally, commentary from the university students participating remotely was shared with symposium participants.

In addition to shedding light on three important current topics in conservation, the symposium provided a model for

generating debate about these issues. The event was also innovative for working with newly elected mayors on crucial challenges facing their cities and for including students among the participants.

For analysis of the ideas presented at the symposium or for additional information on the OWHC, visit its Web site at www.ovpm.org/index.php.

Hurricane Katrina Recovery Grant

The Getty Foundation has awarded a grant of \$100,000 to the U.S. National Trust for Historic Preservation to fund the first three months of the National Trust's recovery and outreach efforts to the regions damaged by Hurricane Katrina in August 2005.

The grant will cover the expenses necessary to send volunteer teams of architects, conservators, and engineers to Alabama, Louisiana, and Mississippi to assess the damage caused to historic buildings and districts by the storm and flooding.

The National Trust will work in collaboration with other preservation organizations, state historic preservation officers, and federal agencies to ensure that preservation is taken into consideration before buildings are marked for demolition.

The Getty Foundation and the Getty Conservation Institute have long worked with the National Trust on preservation initiatives. Through its Museums Emergency Program Education Initiative with ICOM and ICCROM (see page 26), the GCI also assists museums and other cultural institutions around the world in the development of emergency preparedness and response plans.

For further information on the National Trust's hurricane recovery efforts, visit its Web site at www.nationaltrust.org.

Oxygen-Free Case for Declaration of Arbroath

In September 2005, the Getty Conservation Institute was recognized by the National Archives of Scotland and the Scottish Parliament for its design and fabrication assistance for the oxygen-free display case for the Declaration of Arbroath—a fourteenth-century document of Scottish independence and a national icon. The ceremony was attended by GCI staff, members of the Scottish Parliament, representatives from the diplomatic community, and members of local cultural institutions.

The ceremony coincided with a reception for the *For Freedom Alone* exhibition held at the Scottish Parliament House, which highlighted the Scottish Wars of Independence through historic documents. The Declaration of Arbroath—a letter, written in 1320, from the earls and barons of Scotland to Pope John XXII asking for recognition of Scottish independence and acknowledgment of Robert I as king of Scotland—is the centerpiece of the exhibition. Because of its fragile condition, the declaration had not been displayed publicly

The Declaration of Arbroath on view in a GCI-designed oxygen-free display case.
Photo: Courtesy National Archives of Scotland.



Modern Paints Symposium

for more than five years. The specially constructed case allows the document to be viewed by the public. Filled with nitrogen and hermetically sealed to maintain a stable environment, the case incorporates recent design improvements made by the GCI that include the capability to monitor the case's environment from anywhere in the world via the Internet. The display case is the first of its kind in the United Kingdom.

Linda Ramsay, head of conservation at the National Archives of Scotland, was responsible for the conservation of the declaration and oversaw the local fabrication of the case, which was built by Professor Robert Ruben and a team from the Mechanical and Chemical Engineering Department at Heriot-Watt University, Edinburgh. The display case is the final product of a decade-long project to conserve the Declaration of Arbroath.

For more information on the declaration and on the design of the case, visit the Scottish National Archives at www.nas.gov.uk.



modern paints uncovered

The Getty Conservation Institute, the National Gallery of Art in Washington, D.C., and Tate will host a symposium on modern paints research, “Modern Paints Uncovered,” May 16–19, 2006, at Tate Modern in London.

A staggering array of new pigments and binding media has been developed and used in the production of paint since 1930. There are now hundreds of pigments available to paint formulators, and the introduction of synthetic binders—most notably acrylic, alkyd, polyvinyl acetate, and nitrocellulose—has resulted in paints with great flexibility, fast drying times, and reduced yellowing tendencies—and, in the case of emulsion formulations, without the need for organic solvents as thinners and diluents.

Many artists have utilized these modern paints (including house paints and others never intended specifically for artists' use) and have explored and exploited their distinct handling and optical properties. The diversity in materials used in the production of modern paints has important conservation implications for the works of art in which they have been utilized.

This symposium will draw together the varied strands of research currently being conducted by conservation scientists and conservators on modern paint materials and will address some of the concerns associated with these paints and the challenges inherent in developing appropriate conservation approaches.

The symposium program and registration information can be found at www.getty.edu/conservation/science/modpaints/mpu.html.

Winter Lectures

The GCI announces its winter 2006 schedule for “Conservation Matters: Lectures at the Getty,” a public series examining a broad range of conservation issues from around the world. Lectures are held evenings at 7:00 p.m. at the Getty Center. Events are free, but reservations are required. To make a reservation or for further information, visit the Getty Web site at www.getty.edu/conservation/public_programs/lectures.html. Reservations can also be made by calling (310) 440-7300.

Preservation Strategies in a World of Access

January 24, 2006

The photographic collections, prints, and negatives held in the museums, libraries, and archives of the City of Paris are among the most diverse and prestigious in the world. *Anne Cartier-Bresson*, director of the Atelier for the Restoration and Conservation of Photographs of the City of Paris, will describe the challenge of enhancing and preserving the city’s photographic heritage, while undertaking initiatives to make these collections accessible to a broad and enthusiastic public.

The National Archives: Preserving America’s History

February 16, 2006

Doris A. Hamburg, director of preservation programs at the U.S. National Archives and Records Administration (NARA), will relate the fascinating story of NARA’s recent monumental and complex project to conserve the nation’s cherished

charters of freedom—the Declaration of Independence, the Constitution, and the Bill of Rights—as well as its efforts to renovate the historic National Archives Building in Washington, D.C., and the William Faulkner murals in the National Archives rotunda.

Science and Conservation of Cultural Heritage: Michelangelo to Bonampak or Lapis Lazuli to Maya Blue

March 16, 2006

Drawing on his experience with the conservation of Michelangelo’s *Last Judgment* fresco in the Vatican’s Sistine Chapel, as well as his study of the intriguing ancient pigment Maya blue, *Giacomo Chiari*, chief scientist at the Getty Conservation Institute, will discuss how conservation science utilizes a variety of scientific disciplines to help preserve cultural heritage resources.

Karen Trentelman

Senior Scientist, Science



Photo: Dennis Keeley

Kecia Fong

Project Specialist, Education



Photo: Dennis Keeley

Karen's interest in science began in childhood. She was influenced, in part, by her father, a research immunologist, as well as by her three older brothers, who introduced her to music, photography, and painting. In high school in Salt Lake City, Karen assisted in the chemistry and physics labs and served as president of the science club (whose members spent more time cross-country skiing than conducting experiments).

At the University of Utah, while she majored in chemistry, she also took archaeology and art history courses. She recalls telling her father that she wished that she could find a way to combine art and science. Following graduation, with the strong encouragement of her mother, Karen attended graduate school at Cornell University and completed her PhD in chemical physics in 1989. But her attraction to art remained, and she regularly sat in on art

history classes at Cornell. It was also there that she discovered conservation science, when she heard a lecture by Lambertus van Zelst, then head of the Smithsonian Conservation Analytical Laboratory.

Karen followed her graduate studies with two postdoctoral fellowships, the first at Northwestern University, where she met Simon, her husband-to-be. During a job interview at the National Oceanic and Atmospheric Administration, someone suggested that, given her interests, she should explore conservation. This idea prompted her to volunteer her services to the Art Institute of Chicago, where she helped determine the equipment needed to establish a conservation science lab. This project connected her with members of the conservation profession, one of whom suggested her for a one-year teaching appointment in the conservation program at Buffalo State University. In 1995, after a year at Buffalo, she was hired as a conservation scientist by

the Detroit Institute of Arts, where she enjoyed regular contact with conservators and the opportunity to work with a variety of objects and materials. Karen was one of the first museum scientists to use Raman spectroscopy to examine works of art. She was also the first conservation scientist to be awarded a National Science Foundation grant.

Karen joined the GCI in 2004 to head the Institute's Museum Research Laboratory, welcoming the chance to make use of the GCI's technical resources and to be part of a larger scientific community. Her current work includes conducting a study of an early seventeenth-century manuscript on the history of Peru and setting up the GCI's scientific laboratory at the Getty Villa, which will focus on the Getty's antiquities collection.

Kecia was born in Hawaii and spent her early years there. When she was thirteen, she and her family left for the mainland, moving to the San Francisco Bay Area. Dance was an early love of hers, and by high school she was a member of the All City Dance Theatre Ensemble. She enrolled at Sarah Lawrence College in New York for its dance and liberal arts programs, but she soon decided that focusing on dance would not give her enough freedom to explore other interests. In addition to courses in Asian studies and a year of Tibetan studies in Nepal, Kecia had internships at the New York City Landmarks Preservation Commission and the Settlement Housing Fund (SHF). Each experience nourished her interest in the dynamic relationships among communities, their identities, and the built environment.

For several years after graduation, she worked in New York City in community development with the SHF, and she also interned at architectural firms. During the same period, she spent a summer in Beijing studying Mandarin, along with her grandmother from Hawaii. Her interest in tradition, history, and culture prompted her to gravitate toward historic preservation, and in 1994 she entered the historic preservation master's program at the University of Pennsylvania.

Her graduate studies included fieldwork at several sites in the United States, as well as in Cairo, where she worked for the Aga Khan Trust for Culture on the development of a conservation plan for the historic Islamic quarter. After completing her studies, Kecia worked for the U.S. National Park Service, for a private architectural conservation firm in New York, and for an Italian conservation firm with projects in Turkey and Italy. In 2000 she joined the

San Francisco branch of an engineering firm to help develop their architectural conservation practice, a position that provided her with valuable experience in project management.

In 2003 Frank Matero, Kecia's professor at the University of Pennsylvania, convinced her to apply for a position in the Education section of the GCI. She had always been interested in education and had enjoyed doing field training with graduate students, so it was an opportunity she welcomed. Her work at the Institute has included preparation for an upcoming workshop in Tunisia on site conservation and management and conducting an assessment of the education and training needs of built heritage conservation in Southeast Asia. The international character of the work and the chance to collaborate with colleagues who share her belief in the importance of that work has been extremely gratifying.

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