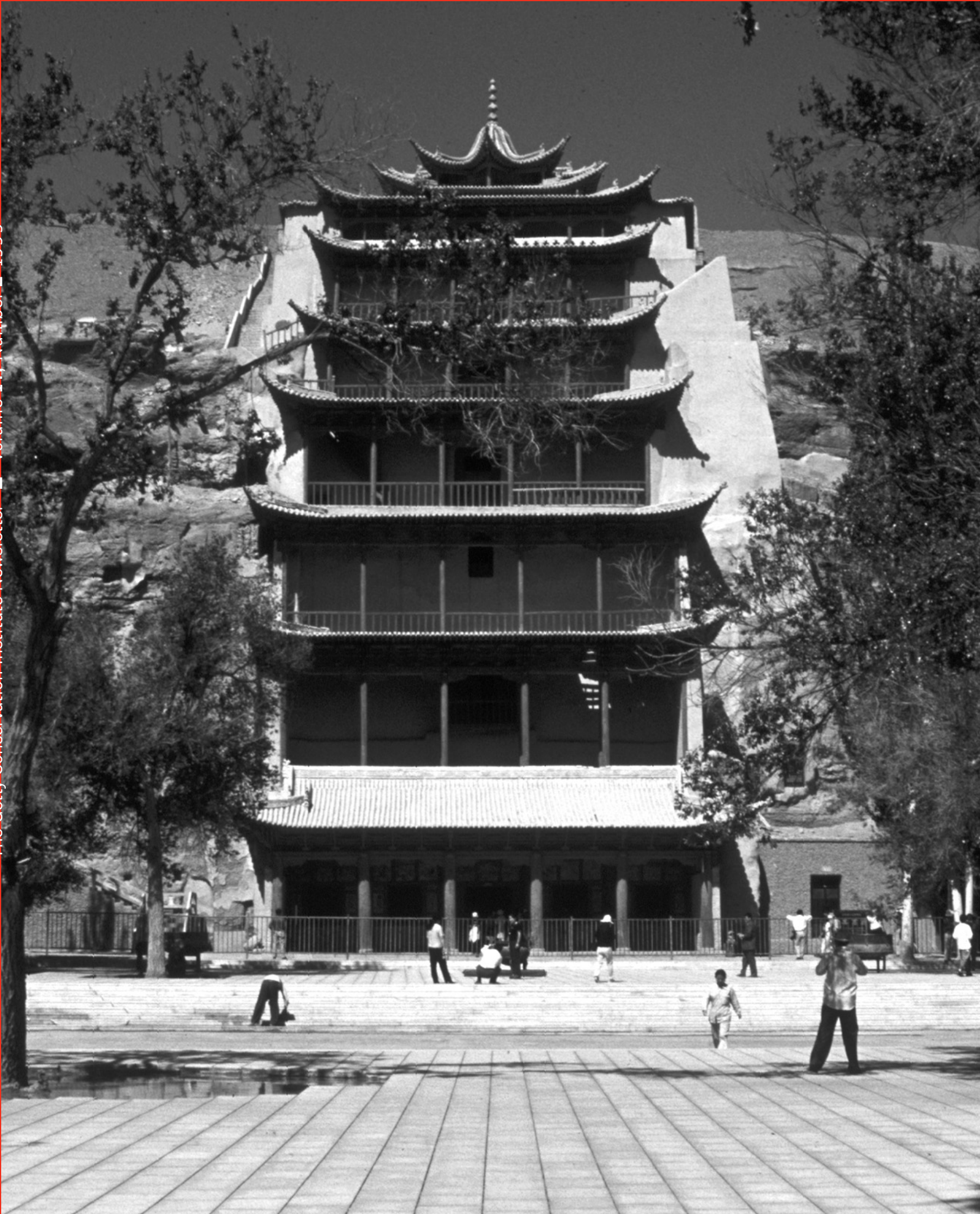


# Conservation

The Getty Conservation Institute Newsletter ■ Volume 14, Number 2 1999



# The Getty Conservation Institute Newsletter

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Front cover: The nine-story landmark pagoda of the Mogao grottoes. The pagoda encloses Cave 96, which houses an enormous Tang dynasty Buddha, around 32 meters high. *Photo:* Neville Agnew.

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Just one hundred years ago, at the ancient Buddhist cave temples of Mogao in the remote desert of northwest China, a Daoist monk named Wang Yuanlu made an astonishing discovery—a hidden library in Cave 17, sealed off in the 11th century. Since that discovery, the Mogao grottoes have become a mecca for scholars and tourists from around the world. For the last decade, the Getty Conservation Institute has been working in a variety of ways with the Dunhuang Academy at Mogao to preserve this extraordinary World Heritage site, whose art documents a thousand years of Chinese history.

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In the small town of Yanhuitlán, Oaxaca, can be found one of Mexico's finest examples of colonial art—the main *retablo*, or altarpiece, of the Church of Santo Domingo. For several years, the GCI has been engaged in a project to conserve the retablo, in collaboration with the Instituto Nacional de Antropología e Historia and the community of Yanhuitlán. Extensive documentation of the retablo is completed, and the project team is now grappling with determining the best way to structurally stabilize this work of art, which is located in a region of frequent seismic activity.

### 21 **Harnessing Digital Technology for Conservation Documentation**

The center of the GCI's computer documentation work is its digital lab, housing imaging equipment and computers. Created over three years ago by the Institute's Conservation group to promote digital documentation, the lab has objectives that include support for documentation in field campaigns, training, and research. While integration of digital tools into the conservation documentation process is in its early stages, it holds the promise of vastly increasing the body of information easily available to conservation teams in the field and in the lab.

## GCI News

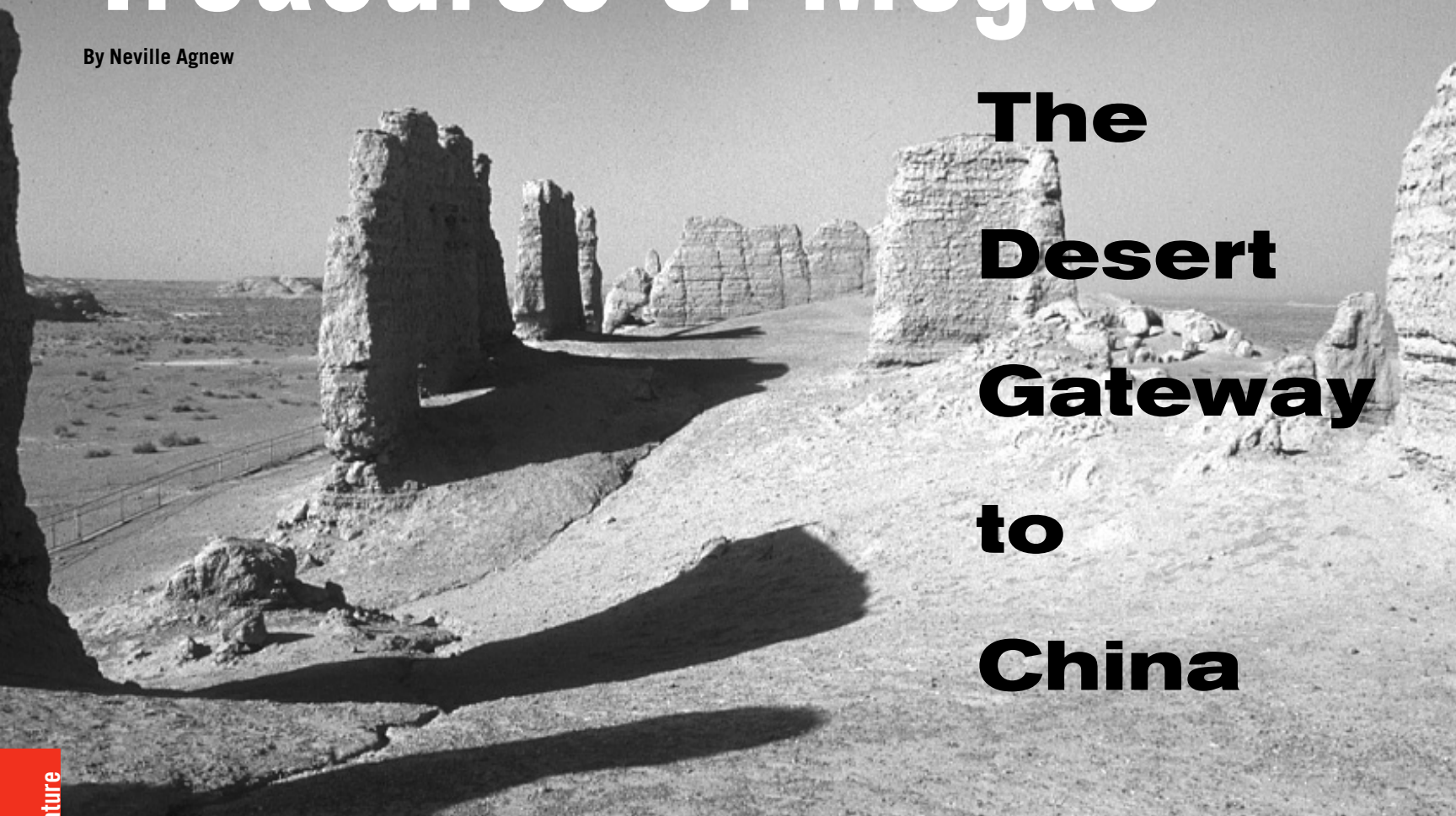
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# Treasures of Mogao

By Neville Agnew

## The Desert Gateway to China



Feature

The ruins of the earthen fort and military granary at Yumenguan—known as the Jade Gate—some 90 kilometers to the west of Dunhuang, site of the Mogao grottoes. *Photo: Francesca Piqué.*

JUST ONE HUNDRED YEARS AGO, at the ancient Buddhist cave temples of Mogao in the remote desert of northwest China, a Daoist monk named Wang Yuanlu made an astonishing discovery.

Abbot Wang, as he is often called, had taken up residence as the self-appointed guardian of Mogao—the Caves of the Thousand Buddhas—close to the oasis town of Dunhuang, which centuries before had been the gateway from China to the western regions along the Silk Road. Until Wang took over the site, it seems to have been largely abandoned since the early Ming dynasty (1368–1644), a time when China had drawn in upon itself as the self-sufficient “Middle Kingdom.” During the centuries of abandonment, Mogao, while undoubtedly used as a local religious center, was essentially forgotten. Windblown sands smothered the grottoes, and decay overtook the wooden temple facades built on the cliff face into which the caves were cut.

What Abbot Wang found by chance was a hidden library in Cave 17, sealed at the beginning of the 11th century. In it were tens

of thousands of documents written in Sanskrit, Tibetan, Tangut, and other languages besides Chinese; silk banners; scrolls; and, most significantly, the Diamond Sutra, a Buddhist devotional text and the earliest known printed book, dated from the colophon to 868. There were also calendars, regional records, contracts for sale of land, and, famously, a model letter of apology to one’s host for having imbibed too freely. In short, an extraordinary record of the early medieval Chinese world.

The abbot knew nothing of this detail, nor was his main concern the documents, though he recognized them as a trove of great value. His passion was for the cave temples, or grottoes, that honey-combed the face of the mile-long cliff—some five hundred of them extant, constructed over a period of a thousand years, from the 4th century to the 14th century. The fabulous paintings that covered every inch of the walls and ceilings and the exquisitely modeled and polychrome clay sculpture within the temples—these were the subject of his veneration.

## The Peerless Caves

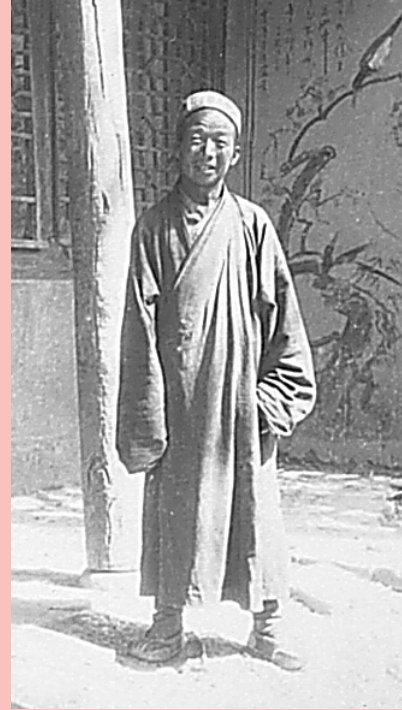
While Abbot Wang's interest in the grottoes was solely religious, the world has come to see the significance of Mogao as extending beyond the spiritual. Its designation as a World Heritage site in 1987 recognized how remarkably the wealth of heritage at Mogao captures the pageant of Chinese life and customs spanning a millennium.

There are many fascinating stories to tell about Dunhuang and Mogao, "The Peerless Caves." One is the story of Buddhism's spread into China and eventually into Korea and Japan. It was through this tiny oasis portal at the confluence of the two arms of the Silk Road, which skirt the fearful Takla Makan Desert on the north and south, that Buddhism was introduced from India in the first century. Another story is the plunder of the archive of Cave 17, the removal of many of its contents to museums around the world, and how this dispersal led to a flourishing international discipline of Dunhuang studies. Third, there is the study of a thousand years of Chinese Buddhism from the Mogao wall paintings and wall inscriptions, which reveal life in China at all levels of society. The cave art richly documents the costume, dance, and music of eight dynasties of Chinese history, as well as agriculture and daily existence in a remote outpost of the empire. Here are portraits of the nobles who commissioned the caves, along with their wives and retainers, named in inscriptions on the walls.

**A pile of some of the ancient manuscripts discovered at the turn of the century in Cave 17 of the Mogao grottoes. Photo: Sir Aurel Stein. Courtesy the Oriental and India Office, The British Library.**



**Wang Yuanlu, the Daoist monk who, a hundred years ago, discovered tens of thousands of ancient documents that had been sealed in Cave 17 of the Mogao grottoes at the beginning of the 11th century. Photo: Sir Aurel Stein. Courtesy the Oriental and India Office, The British Library.**



Then there is the two-thousand-year history of Mogao and Dunhuang. Dunhuang was founded in 111 B.C.E. as a commandery, the last outpost of newly unified Han China. As elsewhere in China, Dunhuang's history is one of conquest by fierce neighbors—in this case, the Northern Wei and the Tibetans—and reconquest by the ethnic Chinese. The history of the north of China is one of turmoil and flux, as nomads and migrants from the mountains and steppe swept down upon the agriculturalists. This conflict led to the construction of the first Great Wall, started by the unifier of China, Qin Shi Huangdi, the first emperor of the Qin dynasty

(221–206 B.C.E.), a task that continued intermittently over the centuries and was greatly extended during the Ming dynasty. Remnants of the wall and watchtowers, built of earth during the Han dynasty (206 B.C.E.–220 C.E.), can still be seen west of Dunhuang at Yumenguan, the so-called Jade Gate through which passed annual tributes of precious jade from present-day Xinjiang. Here in the desert lie neatly stacked piles of reeds, ready as they have been for 20 centuries to be lit as signal fires on the approach of the enemy.

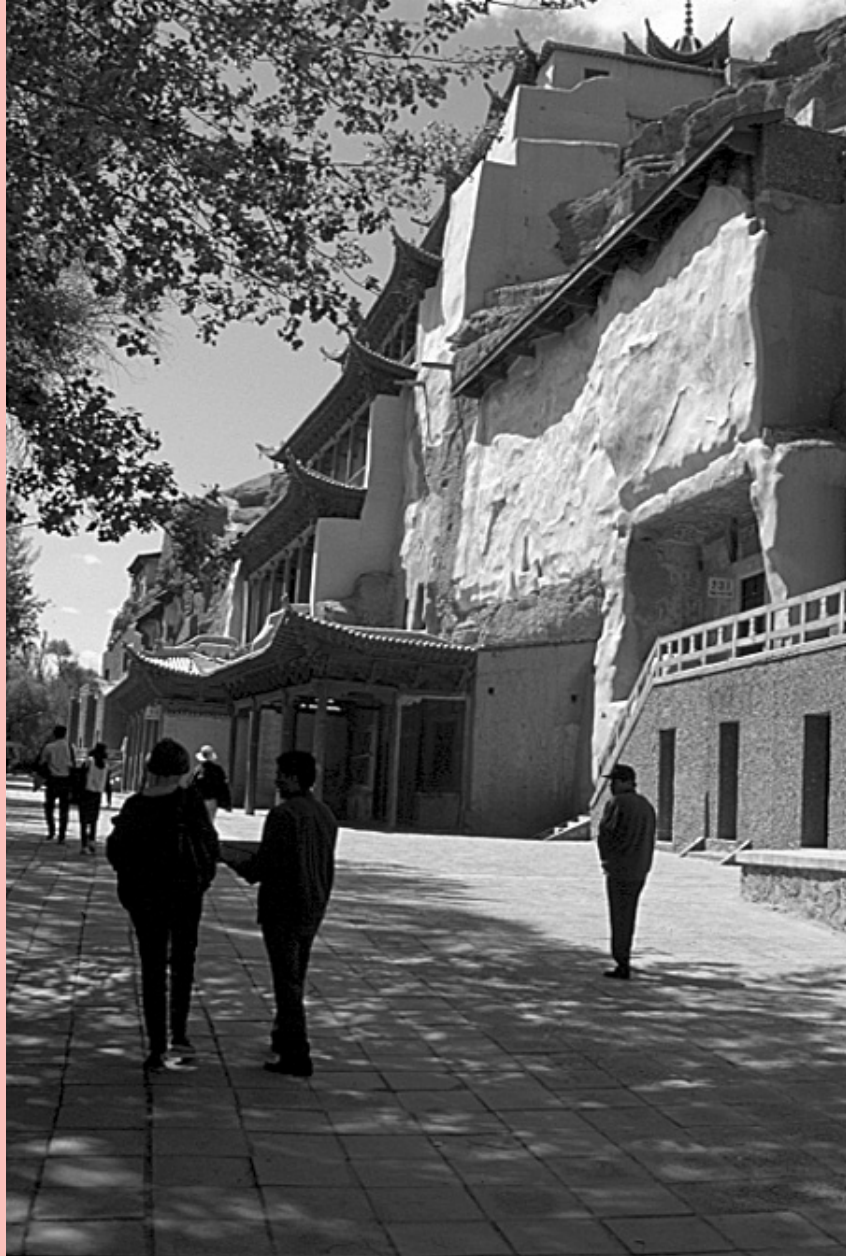
From the middle of the 20th century, there is the story of the 1943 establishment of the Dunhuang Academy as the organization responsible for Mogao, as well as its trials and vicissitudes through the Cultural Revolution until today. Under remarkable directors and able staff, it has developed into an intellectual and cultural establishment of the first rank. For the last decade, the Getty Conservation Institute has collaborated with this unique institution, working with the academy to preserve the art of Mogao through research, training, and conservation.

The Mogao grottoes, once a site almost unknown to all but a few specialists, is now a mecca for scholars and tourists from around the world.

## Dunhuang Scholarship

Though Marco Polo would have passed through Dunhuang, the first recorded European visit of Mogao in modern times was in 1879 by the geographer and explorer Lajos Lóczy, a member of a Hungarian expedition. He subsequently mentioned it to a friend, Aurel Stein, a Hungarian-born British subject who was later knighted for his Central Asia explorations and for the archaeological collections (now in Britain and India) that he amassed. Having heard of the hidden library, Stein arrived at Mogao in 1907. Abbot Wang was no match against the determined blandishments of Stein, who removed thousands of scrolls on his first forays. In 1913 he returned, and obtained further hundreds of items. In his classic account of exploration in Central Asia, Stein wrote that when he first entered Cave 17, “the sight of the small room disclosed was one to make my eyes open wide. Heaped up in layers, but without perfect order, there appeared in the dim light of the priest’s little lamp a solid mass of manuscript bundles rising to a height of nearly ten feet, and filling, as subsequent measurement showed, close on 500 cubic feet. The area left clear within the room was just sufficient for two people to stand in.”

Stein was followed rapidly by others from France, Germany, Russia, and Japan. The American Langdon Warner, the last of the raiders, arrived on the scene in the 1920s, by which time authorities had given orders for the removal of the remaining manuscripts to Beijing. By this time, too, nationalism and even hostility to foreign archaeologists had grown strong in China, and the government,



A view of a portion of the facade of the Mogao grottoes. In the background is the nine-story pagoda enclosing Cave 96. Photo: Leslie Rainer.



The documentation team at work in Cave 85, recording the condition of the wall paintings. Photo: Leslie Rainer.

though weak, forbade removal of artifacts from sites in China. Nonetheless, Warner did get to Mogao and Dunhuang, and Dunhuang Academy staff today may show visitors a small area of wall painting in one of the caves which they say was in the process of being lifted by Warner when he was stopped from doing so.

A consequence of the diaspora of the Cave 17 library holdings is the rise of a vibrant field of international scholarship. For example, the International Dunhuang Project at the British Library actively publishes material on the Stein collection. The St. Petersburg branch of the Institute of Oriental Studies at the Russian Academy of Sciences is organizing a conference, “Preservation of Dunhuang and Central Asian Collections,” in St. Petersburg in September of this year. Next year the Dunhuang Academy will celebrate the discovery of the Cave 17 library with an international conference at the site. Wang’s mud-brick temple in front of the grottoes, where he was suborned by Stein into parting with the treasures of the library, is being reconstructed for the event by the Dunhuang Academy, even though there is ambivalence about the monk himself. On the one hand, he is the discoverer; on the other hand, he sold out—and for a pittance at that.

Today China bitterly resents the loss of the Cave 17 library, mainly to Western institutions. To a significant degree, Chinese scholars have been hampered by lack of access to the material, and consequently, a great deal of research on the documents has been done elsewhere. Still, the wall paintings and sculpture at Mogao remain remarkably well preserved, due in part to the extremely dry climate and the remoteness from arenas of warfare. Most damage has been the result of human activity—primarily, it seems, in the first half of the 20th century. The opening of the region to modern road traffic and the lack of site staff and protection before 1943 meant that casual visitors could (and did) deface paintings and mutilate or loot clay sculpture. Also, around 1920, Russian émigrés fleeing the aftermath of the revolution spent a winter in some of the grottoes, and soot from their cooking and heating fires completely blackened paintings.

In 1980, Mogao was opened to tourism, which grew from a trickle to a torrent by the late 1990s. The expansion of Dunhuang airport allows jets to fly daily from Beijing, Xian, and Lanzhou through most of the year. Only in winter, due to the intense cold, is tourism slow. Tourism has transformed Dunhuang from a dusty provincial town of a few thousand inhabitants in the 1940s and 1950s, to a bustling city of street markets and new hotels funded by capital from Hong Kong and elsewhere. This influx has caused the Dunhuang Academy concern about the impact of too many visitors on the art. Mogao remains one of the best-managed sites in China, and the academy is striving to keep abreast of developments in conservation, site presentation, and management through collaborations with the GCI and other organizations, such as the Tokyo

National Research Institute for Cultural Properties. To address one of these issues, the academy erected an exhibition hall on site with 10 full-scale, hand-painted copies of the most popular caves. Since the caves are not artificially lit and visitors must examine the wall paintings by flashlight, the copies are an alternative or complement to the experience of visiting the caves.

There is a long-standing tradition of copying the wall paintings, and the replication section is one of several large departments of the Dunhuang Academy (others include conservation, archives, visitor management, and art-historical research). Recently retired academy director Duan Wenjie, who came to Mogao as an art student in the late 1940s, has written, “I was in charge of the Mogao grottoes for nearly half a century and dedicated my life to copying work. I am deeply convinced that this work is a science unto itself. Copies painted by me and by artists devoting themselves to Dunhuang art have been exhibited at Lanzhou, Xian, Beijing, Shanghai, Tianjin, Shenyang, Hefei, and Taiwan, as well as India, Myanmar, Poland, Czechoslovakia, France, and Japan. . . . In the course of my copying work in the remote desert, I probed into the aesthetics and history of Dunhuang art. Thus, my theoretical research was built on a solid foundation. Dunhuang art will definitely play a positive role in the development of Chinese art and culture and that of the world as well.”

### The GCI at Mogao

This year marks the 10th anniversary of the Getty Conservation Institute’s work at Dunhuang. At the beginning of 1989, an agreement was made between the Getty Trust and the State Bureau of Cultural Relics (now the State Administration for Cultural Heritage, known as SACH). The agreement was deferred for one year after the events at Tiananmen Square in 1989, but planning continued. The first five years of GCI work focused on site stabilization, research on the environmental causes of deterioration, monitoring, and training. This phase culminated in an international conference at Mogao in October 1993, “Conservation of Ancient Sites along the Silk Road,” which also commemorated the 50th anniversary of the Dunhuang Academy. Its purpose was to bring together site managers from the East and the West to exchange experience and knowledge (see *Conservation*, vol. 9, no. 1). Subsequently, the GCI and SACH formally evaluated the work done using independent experts from the United States and Europe, together with a team from China. Overall, their report was very positive; encouraged by this, the GCI has followed up with further collaboration.

The current work focuses on understanding in detail the problems of the deterioration of the wall paintings, the introduction of new materials and methods for the conservation of wall paintings, and research and training. Cave 85, a large Tang dynasty



*Left: A painting of Zhai Farong of the Dunhuang region, the principal donor for Cave 85. The portrait is located at the entrance to the cave. Photo: Sun Hong Cai.*



*Below: A detail of the Tang dynasty paintings in Cave 85, depicting musicians with their instruments. These musical instruments have been recreated for performances at the Dunhuang Academy today. Photo: Sun Hong Cai.*





*Left: A portion of the wall paintings in Cave 85, depicting a variety of scenes from everyday life during the late Tang dynasty. Photo: Francesca Piqué.*

*Right: A detail of a painting in Cave 85 of Buddha and bodhisattvas. Photo: Sun Hong Cai.*



cave on ground level, has been chosen as the exemplar. The work plan follows the methodology of the developing China Principles, a collaboration of the GCI with SACH and the Australian Heritage Commission (see *Conservation*, vol. 13, no. 1). During the June 1999 campaign at Mogao, the two projects converged at the site. The draft China Principles for conservation and management of sites were further refined during this work in the context of conservation and site management at the macrolevel of Mogao. At the same time, the wall paintings team completed the condition recording and assessment following the same methodology, but at the microlevel at Cave 85.

The academy has assembled a large team to work in an integrated fashion with GCI staff, consultants, and partners. From the GCI side, the wall paintings group, led by Francesca Piqué, is completing the condition recording, while Shin Maekawa, who heads the environmental group, is studying the effects of moisture and humidity on the floor and bedrock of the cave. Michael Schilling's analytical team is studying binding media in the wall paintings, identifying pigments, and analyzing clays and the composition of the substrate and their response to humidity changes (see sidebar). As previously, between the two GCI campaigns per annum, in the spring and the fall, the Chinese staff at Mogao continues with data collection and processing.

To expand the training opportunities inherent in the project, the Dunhuang Academy has invited site managers from other sites along the Silk Road to participate in the collaboration. Currently, staff from the Xinjiang sites of Kizil and Jiaohe and from Lanzhou

are team members. The team is further strengthened by Zheng Jun, a Courtauld-trained wall paintings conservator who is on staff at the Chinese National Institute for the Conservation of Cultural Property (CNIP) in Beijing. He, with two Dunhuang Academy staff members (Wang Xudong and Su Bomin), spent one month at the GCI in July 1999 for advanced training in analysis and digital documentation. Further training at the GCI is planned for academy environmental team members next year.

During the years of collaboration between the GCI and the Dunhuang Academy, productive professional and personal relationships have developed. The current director, archaeologist Fan Jinshi, has been at Mogao since 1963. She has dedicated her life to the site, and her unstinting support of the partnership with the GCI provides a constant source of guidance. A core member in the China Principles project, which has worked at other large World Heritage sites such as Chengde (the Qing dynasty summer resort) and Qufu (Confucius's birthplace), Director Fan has stated, "the joint Dunhuang Academy–Getty Conservation Institute work in Cave 85 is integral with the approach to the conservation of this large site of Mogao. Management according to principles that preserve the site's cultural values is now ever more important, as China develops and the pressures of tourism increase. We must succeed in our duty to keep intact the historical record and the sublime beauty of Mogao."

*Neville Agnew is group director of Information & Communications at the GCI.*



# Wall Paintings Conservation at Mogao

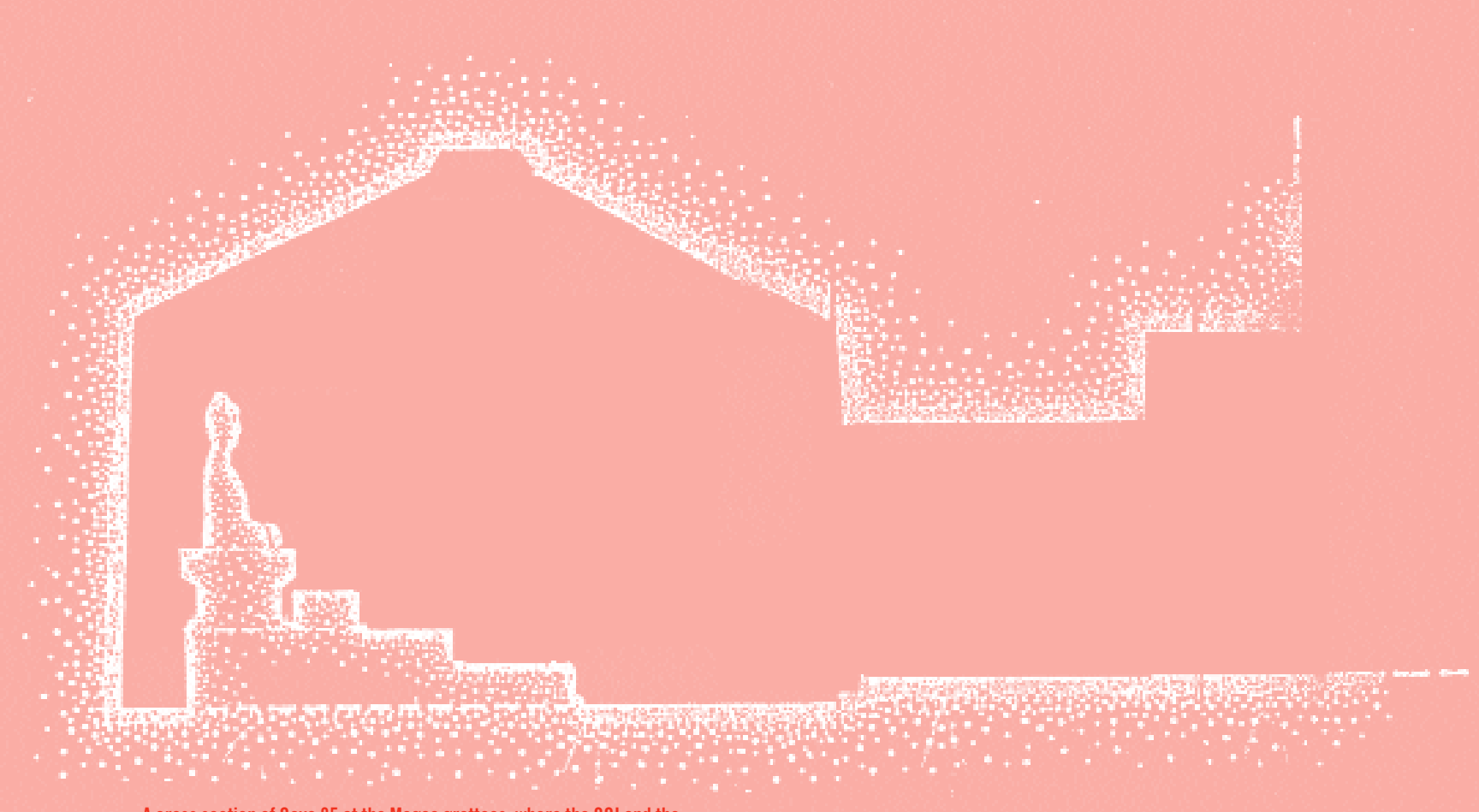
By Francesca Piqué, Shin Maekawa, and Michael Schilling

**S**INCE OCTOBER 1997, THE GCI HAS BEEN WORKING with the Dunhuang Academy on a wall paintings conservation project at the Mogao grottoes. The objective is to identify and address urgent conservation problems affecting the wall paintings, while following the methodology for the conservation and management of cultural heritage sites being developed for China in a collaborative project between China's State Administration for Cultural Heritage, the GCI, and the Australian Heritage Commission. This methodology encompasses a statement of the cultural significance of the cave, condition documentation of the paintings, scientific investigations of environment and materials, and development of treatment strategies.

Cave 85, a large late-Tang dynasty cave, was selected as a model case study. The cave, with 16 large illustrated sutras in the main chamber, was completed in 866 for the Zhai family of the region.

The project's interdisciplinary team is composed of conservators, scientists, engineers, art historians, technical photographers, and draftspersons. The Dunhuang Academy brings to the collaboration long and extensive experience with the preservation of the wall paintings at Mogao, while the GCI's contribution includes expertise in project management and conservation science.

The rock temples of the Mogao grottoes were literally carved into a cliff face of soft conglomerate rock. The temple walls were



A cross section of Cave 85 at the Mogao grottoes, where the GCI and the Dunhuang Academy are collaborating on a wall paintings conservation project. Nearly all of the 350 square meters of wall surface within the cave are covered with wall paintings.



plastered over with a mixture of clay and plant fiber, and the paintings were executed as line drawings in black ink on a layer of fine plaster covering the clay, then filled in with bright mineral colors.

For centuries the paintings have suffered deterioration of various kinds, from flaking and peeling of the paint layer to progressive loss of adhesion between the rock conglomerate and the clay-based plasters. The latter problem has resulted in the delamination of the painted plasters from their support—a problem common to other sites near Dunhuang and on the ancient Silk Road. Large areas of the paintings have been lost, as the delamination finally leads to the collapse and fall of the painted plaster. Since 1943 the Dunhuang Academy has addressed this problem by anchoring the plaster to the rock conglomerate with iron bolts and, more recently, by using liquefied earth-based grouts.

However, the deterioration mechanisms have never been studied rigorously, in a way that would lead to the development of conservation and maintenance solutions. The conservation problems may be related to environmental conditions at the site, as well as to the original painting materials and techniques. While these problems may never be completely eliminated, understanding the causes and processes—in particular the role of water and soluble salts—is the basis for developing measures to reduce the rate of deterioration and ameliorate the situation.

Another conservation problem being addressed is the evaluation of methods for soot removal from the delicate and water-sensitive paintings. Traditional poulticing, as well as more sophisticated gel and laser cleaning techniques, will be tested.

This project is structured in phases—assessment, planning, testing, and implementation. The project team members work in small groups (conservation, documentation, analytical studies, and environmental monitoring) on specific parts of each phase; they are nearing completion of the assessment phase. The paintings' composition (pigments, binder, and stratigraphy), their current state of preservation, and the climatic environment inside and surrounding the cave, as well as the site's complex history, are being examined in order to reconstruct and determine the processes and causes of damage. In this phase, several analytical and environmental studies—such as the thorough examination and detailed recording of the wall paintings' condition and the monitoring of moisture movements in the conglomerate substrate—are being carried out. The design of the conservation plan will be developed jointly with Dunhuang Academy staff, who will undertake most of the actual interventions, once the project has been completed in 2002.

*Francesca Piqué, project specialist, Shin Maekawa, senior scientist, and Michael Schilling, associate scientist, are members of the GCI's team working on the Mogao project.*

# *Serving the Profession*

## A CONVERSATION WITH **Tim Whalen**

**A** California native, Timothy P. Whalen studied at the University of Southern California, where he earned a B.A. in art history and an M.A. in art history and museum studies. In 1981 he came to the Getty, working first at the J. Paul Getty Museum in Malibu, and later as assistant director for administration at the Getty Research Institute for the History of Art and the Humanities. He subsequently served for five years as assistant director of the Getty's building program office, where he supervised and coordinated early planning and programming for the Getty Center project.

In 1991 he joined the Getty Grant Program, where his responsibilities included conservation grant-making activities. During the academic year 1994–95, he was a Loeb Fellow in Advanced Environmental Design at the Harvard University Graduate School of Design, where he examined the role preservation issues play in urban planning and public policy debates.

In December 1998, Whalen was appointed director of the Getty Conservation Institute.

He is a member of the International Council on Monuments and Sites (ICOMOS), the Society for the Preservation of Ancient Buildings, the National Trust for Historic Preservation, the Los Angeles Conservancy, and the Southern California Association for Philanthropy. He was an advisory committee member to the Foundation Center and Council on Foundations' joint study of international grant making, published in 1997.

He spoke with Jeffrey Levin, editor of *Conservation*, The Getty Conservation Institute Newsletter.

**Jeffrey Levin:** You came to the Institute after seven years with the Getty Grant Program supervising grants—including grants for architectural conservation and conservation professional organizations, as well as grants to museums for works of art. How did that work prepare you for your responsibilities here at the GCI?

**Tim Whalen:** One of the privileges of my previous job was that it provided me a perspective on the entire field, worldwide. I was constantly presented with requests that represented the needs of the profession. The job offered a unique view into virtually every aspect of the field—museum conservation, conservation training programs, the committee work of the professional organizations, regional differences, international support institutions, historic building issues, the needs of conservation scientists, and the extraordinary range of skilled professionals that make up the field. This gave me a view of the conservation community that I think very few jobs allow. I was fortunate to know people in architectural conservation, conservation training, and conservation research, and those people who ran the various international bodies or who were chairs of their nation's ICOMOS committee. It was a wonderful opportunity.

*Did you see connections that perhaps others didn't see because they weren't looking at such a variety of areas in conservation?*

Well, as an art historian coming from the museum field, I found that the experience certainly expanded my understanding of what conservation means. Conservation is a word that has so many meanings for so many different people. My years at the Grant Program helped me understand conservation in the broadest sense of the word. In my mind, it is not just caring for a collection or restor-

ing an object. It's all the disciplines that contribute to enabling one to conserve that object. It's the work of curators and scholars who understand that object. It's the material scientists. It's the people trained as actual conservators. It's the scholar who questions the value of conserving the object. It's the people who manage information resources for conservators. It's really everyone who contributes to the preservation of heritage.

*Is that concept of conservation one that the field has embraced in recent years?*

I'm not sure. I sat in an interesting meeting recently with five or six very distinguished people from the conservation profession, and if any disagreement arose, it had to do with the definition of conservation. It seemed to me that half the people at the table thought that conservation was literal intervention, probably on an object. The other half had, I think, a much broader view of conservation, one that related to sites and cultural landscapes, open-ended theoretical research, and the constellation of professionals in between.

*Would you say that this notion of conservation as multidisciplinary is one you'd like to help further as director of the Institute?*

I don't know that it's my mission as much as it is what I believe.

I know my colleagues here think along the same lines. We all see conservation as an interdisciplinary field. What is interesting is that we are part of a larger organization that happens to possess collections, and there are excellent conservators here whose jobs are primarily focused on the care and preservation of those collections. Somehow in some way people feel that to be in stark contrast to us. Our work may be different from that of our colleagues at the Getty Museum, but ultimately our goal is the same as theirs.

*The scope is just different.*

The scope is very different.

*I've heard you talk about growing up in Southern California and how seeing certain things gave you a sense of history and place that probably shaped your interests as an adult and as a professional.*

I grew up in a place that I saw change dramatically, a place where those things that best represented where we came from here in Southern California disappeared. For whatever reason, my own personal interests have always resided with the places people are drawn to—places with which they connect. More often than not, those are places that have history and that people return to because of their genius loci, something that speaks to people. Whether the function of the place changes or not, people continue to be drawn to that place or thing. There's irreplaceable value to this—and those things and places must be preserved.

My own academic work related to the development of urban

Dennis Keeley



centers—Roman Baroque urban planning. So I guess my personal interests tend toward city centers and architecture rather than toward objects per se and the conservation of objects.

One of the most interesting lessons for me was owning a National Register house in Santa Monica. An Irving Gill house. The most important lesson was that historic places don't survive because the government buys them and keeps them alive. Historic places survive because individuals care passionately for them. It has, I think, nothing to do with the amount of money a place possesses. In fact, it has everything to do with leadership and the people who are the stewards of the place or the object. If there are people behind these places who care about them, it's not money that will save them—it's will. I know institutions that have a lot of money but nevertheless are terrible stewards of things. This magical Gill house in Santa Monica was not saved by people with lots of money. It was saved because it was in the hands of people who cared about it and wanted to keep it out of harm's way.

One of the most poignant things I learned was on a recent trip to St. Petersburg, Russia. There, in a place where there were very few financial resources—and oftentimes ideologies counter to preservation—the stewards of buildings were able to protect them despite lack of money because there was passion about them, and the courage and will to protect them.

*How do you see the GCI being organized in the future? What things are going to be emphasized?*

It's important to recognize that the GCI is part of a much larger organization, the Getty Trust, a foundation committed to the visual

arts, to conservation, and to the understanding of works of art, principally through its museum and art-historical scholarship. The GCI is one of the Getty's cornerstones.

My view is that we are here to provide resources to others in a kind of philanthropic model. What we do is serve the field—in the GCI's case, serve the conservation profession. Our job is not to make grants or to give money but to undertake work that serves our professional audience, work that addresses unanswered questions. Again, that's the field of conservation broadly defined. We will continue to do that in areas in which we have great strength, including conservation science and field demonstration projects. There will be an increasing focus on education, an area we've moved away from somewhat. We'll also be focusing on dissemination of information about conservation through our publications—which continue to be very thoughtful and strong—and through new electronic means that we haven't pursued aggressively, particularly the delivery of conservation information over our Web site. And we'll continue publishing the very valuable and, I think, beloved publication known as the *AATA*. I don't see huge shifts in our areas of interest—perhaps a little more focus, and the promise that everything we do is in service to the profession.

*What are your thoughts on GCI education initiatives?*

Over the next year we'll look very carefully at how our resources can be used to advance conservation education. We will not pursue conservation training as we did in the past when we developed and delivered individual courses. Other organizations do that extremely well, and I think we should rely on the excellent work that they are already doing.

A project like our Latin American Consortium—which we're collaborating on with a number of training institutions in Latin America—in some respects may serve as a kind of model for our work. In that instance, we were able with our resources, both human and electronic, to convene a group of conservation educators to leverage their resources over the Web and help them share information about preventive conservation to a degree that would not have been possible without the collective involvement of the other partners. We need to look for opportunities where we can bring people together to address needs in conservation education collectively.

*Over the years, the GCI has done a lot of work in archaeological conservation and site management. Is that, too, an area where you see continued activity?*

Absolutely. We're involved now through our Maya Initiative in the development of a site management project. And we're beginning to consider whether there are solid opportunities for us to carry out a similar project in the Mediterranean, though it will take a lot of time and discussion to determine if there's something that we can

contribute. Most important, if we contribute to it, does it have a residual lasting effect in the place? We have to know clearly why we're operating in a certain place and why we are there, rather than another institution. We have to look at our work strategically, and if we choose a project in a particular place, we have to make sure that not only are we bringing some level of expertise to the place but also that we at the GCI are learning something we can then apply to our own work. It's a two-way street. I worry about the colonialistic aspect of landing in a place and professing our expertise, when in fact there's all sorts of resident expertise. What we have done well is bring together multidisciplinary teams and worked with colleagues abroad to demonstrate the benefits of a multifaceted approach, particularly with regard to site management and archaeological conservation.

*In the past, the selection of projects depended in part on their ability to serve as models for addressing similar problems or conservation issues in specific regions or even globally. I presume that requirement will remain.*

A project must serve as a model. I don't see a future where we conserve something solely for the sake of stabilizing a site or an object. If we go in and conservation intervention is involved, it's the result of research we've done, and with our local partners, we are undertaking that intervention in such a way that other colleagues in a region can possibly emulate it and benefit from it. A project in which we simply stabilize a building or site because it's in need of care is not something that we as an institution can afford to do. There are other organizations that do that well and that are set up differently to do it, perhaps more effectively than we are.

*A lot of the GCI's work deals with the technical aspects of conservation. What role do you think the Institute should play in looking at the intellectual underpinnings of conservation?*

We can't operate as a modern conservation institute if we aren't considering the broader philosophical and intellectual underpinnings of the field. It's impossible. People forget that there's an infrastructure required to allow someone to undertake, as you put it, the technical aspects of conservation. To get to that point, all of those other issues—call them philosophical, call them pure research—have to be considered. For example, with our work in site management, clearly the economics of conservation play into it, because there are issues of tourism and of the values and benefits people apply to these places. Unless we as an institution consider those issues as well, and contribute to that thinking, we can't be effective. It has to be integrated into our work, because we have to be asking those kinds of questions, particularly in our fieldwork. We'll continue pursuing that kind of research. We won't have an entire group dedicated to it, but that in no way discounts how much we value that kind of thinking and that line of inquiry.

**“We can’t operate as a modern  
conservation institute  
if we aren’t considering  
the broader philosophical  
and intellectual underpin-  
nings of the field.”**

*What kind of role can the GCI play in terms of leadership in the conservation field?*

As a private, generously funded institution dedicated to conservation, we’re in a unique position. As a result, we have a responsibility to serve. There’s always been the risk that the Getty, because of its enormous wealth, would be perceived as able to solve every problem in all the fields in which we’re active. That’s obviously impossible. We have to be very selective, pursuing only those unanswered questions in conservation that we have the financial, human, and physical resources to pursue. I hope we will do many things deeply and well. But we won’t be active in every corner of the world.

I also think it’s important to work with a recognition of what the Getty is and the extraordinary resources that are part of its collections. Take photographs, for example. Photographic conservation is an area where there’s great room for advancement in the world, and it seems to me that this is an area ripe for development for us, because it’s a natural interest of the Getty.

*Certainly there has been much more emphasis in the last year on the Getty as one unified institution.*

Ultimately the interests of everyone at the Getty reside in visual culture, art, and material culture—in either interpreting it, preserving it, or studying it. There’s much commonality in that. We all ultimately focus on the same kinds of materials. We just bring different passions and interests to these materials. What I see happening at the Getty is really an increasing recognition of what we have in common, our common interests, rather than a focus on institutional differences.

*Looking at the conservation field in general, where do you think the future challenges lie?*

One thing—and this probably grows out of my foundation work—is a continued decrease in financial resources. That will remain a challenge. But the field is very nimble, filled with very dedicated people. What I think we’re seeing is a focus on preventive conservation strategies—the development of means and methods that can take a much larger view of heritage preservation. For example, in archives or libraries, looking at how to protect an entire collection rather than an individual book. In the United States and in the West, that is the trend. I think we all realize, particularly at the Getty, that this is where our work and funding can be the most effective. And I think that is where it is most needed. We understand pretty well the mechanics of deterioration. But rather than looking at it on an individual or an object basis, the work of places like the Getty is going to continue to focus on how you can expand care for as many things as possible with as few resources as possible.

*Collective conservation as opposed to the treatment of individual objects . . .*

Exactly. I had an interesting discussion the other day with Larry Reger, president of Heritage Preservation in Washington, D.C., and he made the observation that, in his experience, if you bring legislators solid data about how you can preserve something at a macrolevel, they will listen. People understand that and may support that more willingly than individual intervention, even though most people are fascinated by the individual intervention because it’s visually interesting and memorable. The institutions providing either technological or financial resources recognize that the future lies in the collective approach.

I also think that we need greater coordination and integration between institutions. We don’t need to be “nationalistic.” If one institution is working on a particular technology, then let them work on it and let us take up something else. There are, as we all know, fewer and fewer resources to go around. Some of the most interesting work that we have pursued here in the last three years includes collaborative projects with our professional counterparts, like ICCROM and CRATERRE-EAG. We’ve had very solid results with that work, and we’ve been able to spread ourselves much more broadly than we would have otherwise. That’s an example of where I think the field is going.

# The Retablo of Yanhuitlán

By Françoise Descamps,  
Valerie Dorge, and Giora Solar



IN THE SMALL TOWN OF YANHUITLÁN, OAXACA, can be found one of Mexico's finest examples of colonial art. The main *retablo*, or altarpiece, of the Church of Santo Domingo, located in the church's apse, is composed of 11 large panel paintings and several smaller paintings, as well as 16 large sculptures in a wooden frame. The architecture of the frame consists of structural and decorative elements that are carved and gilded or painted. Substantial in size, the retablo is 9 meters wide and nearly 20 meters high.

The town of Yanhuitlán is in a region of frequent seismic activity, and the structural stability of the retablo has been a problem. Previous interventions, such as the addition of steel tensors, wooden supports and sundry cords, wires, and nails, are evidence that the stability of the retablo was a concern in the past. In approximately 1974, an extensive intervention was carried out to stabilize the altarpiece; it involved the building of a supporting steel structure behind the retablo. Most of the accessible pieces of the retablo frame are anchored to the steel structure.

Several years ago, the Yanhuitlán community, worried about the state of this important part of their heritage, requested that the GCI undertake the conservation and restoration of the altarpiece. A partnership was subsequently developed with the Instituto Nacional de Antropología e Historia (INAH), the institution responsible for Mexico's national cultural heritage, and INAH incorporated the retablo project into its overall social and economic development and cultural plan for Yanhuitlán. Additional funds for the project came from a Los Angeles-based private group, Friends of Heritage Preservation, which supports preservation projects worldwide.

**The main retablo of the Church of Santo Domingo. The complex scaffolding system is necessary to provide the project team with access to all parts of the retablo. The church continues in its function, with a temporary main altar seen in the foreground. Photo: Brian Considine.**



**View of the Church of Santo Domingo and part of the adjoining monastery. The imposing church is the focal point of the town of Yanhuitlán. The current facade, built in the 17th century, covers the original 16th-century facade. Photo: Guillermo Aldana.**



The project provides an opportunity to develop a model that can be applied in the many similar situations that involve preservation of retablos in seismic zones. The community has played an active role in the project through the collaboration of its representatives. The project has also included training for conservation students and for community members who will be responsible for the long-term maintenance and security of the altarpieces in the church.

The retablo has an unusual and complex plan to accommodate the shape of the apse and is not anchored to the apse wall. First constructed around 1570, the retablo underwent stylistic changes from Renaissance to Baroque in the early 18th century; according to historic sources, the original paintings and sculptures were retained.

The main retablo, as well as the numerous art objects still remaining in the church, are testimony to the importance of Yanhuitlán since the 16th century, when Dominican priests established a number of major churches and monasteries in the region. The panel paintings are attributed to the artist Andres de la Concha, who was brought from Spain to work on this retablo and others in the Oaxaca area. The altarpiece is significant not only for its artistic and aesthetic qualities but also because it serves as a historical record of retablo construction materials and techniques. Besides the stylistic changes made in the 18th century and a few other minor changes—such as the replacement of some carved sections with pieces taken from lateral altarpieces in the church (a common local practice) and the loss of one painting during a 1977 looting—this exceptional retablo is remarkably intact compared with other retablos. It appears to have escaped the fate of some early altarpieces—that of being dismantled and subsequently reassembled in the intervening centuries, often with replacement elements.

Considering its 400 years of existence in a major seismic zone, it is not surprising that the physical condition of the retablo requires intervention. The wooden framework is weak, with frac-

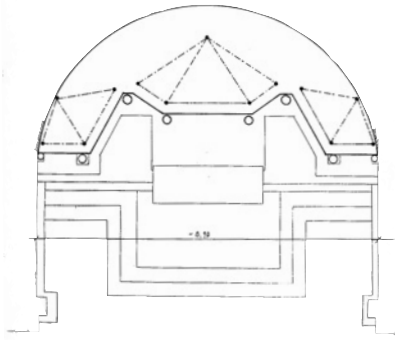
tures in a number of elements, causing a general load unevenness. Although the new steel structure has supported the retablo, its long-term effectiveness is a concern.

The retablo also remains highly important to the citizens of Yanhuitlán, for whom the Church of Santo Domingo continues to function as a significant focus of community life—and not only for those still there. Former community members, today spread throughout Mexico and the United States, often return for religious ceremonies at the church.

### **The Retablo Project**

The first step in the project was to study the structure of the retablo and to analyze its deformations, past interventions, and current condition. At the same time, archival and bibliographical research continued to augment the considerable amount of information already gathered by INAH. A documentation process was also established to identify the specific problems and condition of each component and to organize the information in a format that would accommodate general and detailed analyses and facilitate a comprehensive understanding of the retablo's condition. The documentation combined written, graphic, and photographic formats, and a database was developed to manage and manipulate the extensive amount of information generated. The documentation of the state of the retablo is now detailed and comprehensive (see p. 22).

From the start of the project, it was apparent that the main problems of the retablo were its structural stability as well as the conservation of its elements. Prior to the condition assessment, it was not possible to define the causes of its apparent structural instability. Theoretically, it could be the result of several different causes or a combination of them. Wood decay, historic changes in the retablo that have weakened its structural capacity, or hundreds of minor and major earthquakes over time could all have played a role.



A schematic floor plan showing the apse wall, the retablo (the solid line), and the three separate sections of the steel support structure built around 1974 (the broken lines). From a report prepared by Büro für Baukonstruktionen.

Since traditional conservation allows for dismantling and reassembling altarpieces that have serious problems, it was assumed that this approach might be taken with Yanhuitlán’s main retablo if no other solution could be found. (A preliminary conservation study, carried out prior to the project, recommended dismantling the retablo for conservation.)

The other major step, therefore, was an in-depth engineering study by a structural engineering team consisting of a European firm, internationally renowned for its work in the stabilization of historical structures in different countries, and a Mexican firm. The study of the retablo’s structural system, from its original state to its current condition, addressed four main questions:

- What was the original resistance capacity of the retablo in normal situations and in the event of an earthquake?
- Was it possible to restore the retablo to its original stability?
- Was the current steel structure, dating from 1974, sufficiently resilient to withstand any stress in supporting the retablo?
- Could the retablo be conserved in situ (i.e., without disassembly)?

After investigation and analysis, the structural engineers reported that it was difficult to ascertain the retablo’s original capacity to withstand seismic activity. They did estimate that the retablo had been able to carry its own load but that its design was unsuitable for resisting the effects of a prolonged or intense earthquake. The steel structure had been efficient in its supporting role until now; however, in the retablo’s current state, deformations and damage indicated that it had reached the limits of its structural stability. It was likely that the weakening and deformation of the wood would continue to shift more load onto the steel structure.

The data collected in the condition survey provided the information necessary for assessing each component of the retablo—the paintings and sculptures, as well as the carved and gilded or painted elements of the wood frame and its building system.

Based on their experience, some conservators on the project team felt that local conditions would not allow for the use of mate-

rials and methods that might be required for in situ conservation of the panel paintings. However, other project conservators believed that while the conservation in situ of the paintings would present some challenges, it could be successfully carried out. While deformations and misalignment in the wooden framework could be only minimally corrected in situ, the applied decorative elements could be realigned and secured in their proper locations, thus restoring to a significant degree the retablo’s aesthetic quality. Due to the excellent quality and condition of the gilded and painted wooden surfaces, only a gentle cleaning and minor consolidation were believed necessary.

### In Situ Conservation versus Disassembly: A Conundrum

In their assessment of the altarpiece in Yanhuitlán, the structural engineers reported that the retablo could be consolidated and secured without its being dismantled. They went on to state that disassembly of the retablo posed major risks—a concern shared by some on the conservation team. This assessment was accompanied by a preliminary structural consolidation solution that was later developed into a detailed plan. The plan was based on strengthening the existing metal support by adding elements and new foundations. The proposal did not exclude the possible need to dismantle or replace minor pieces.

Another issue—whether the panel paintings could be conserved in situ or should be removed for treatment—also received a structural appraisal. The panels play an important role in the structural stability of the retablo, serving as diagonal components in the

Rear view of the retablo and the interior stone wall of the apse, from the base looking upward. The large vertical poles are part of the original support system that no longer functions, due to the loss of base sections. Two of the three sections of the steel structure can be seen. (The horizontal boards on these structures provided temporary access for an initial inspection.)  
Photo: Lori Anglin.



structural system. One painting could be removed if necessary, and a temporary wooden frame could be inserted in its place. Removal of most of the paintings, however, would potentially require total dismantling.

At this moment, the Yanhuitlán project team is grappling with the decision as to which conservation approach is both technically wise and best preserves the values inherent in the retablo.

The considerations for in situ conservation hold that this is the most appropriate way to preserve the retablo's artistic and historic values, as well as the authenticity of most of its original parts, including the assembly techniques and details. It also avoids the potential for damage that can occur during disassembly, storage and treatment, and reassembly. With in situ conservation, the religious significance of the retablo—still in constant use as the main altar of the church—would also be fully respected. While this approach would entail some aesthetic compromise, the altarpiece would be structurally stable and significantly conserved, and it would continue to reflect its history of four centuries as an important part of the cultural heritage of the community.

The case against conservation in situ recognizes the historical and technical values of the retablo but holds its aesthetic value as so significant that even if the retablo can be structurally secured in situ, it is important to reestablish its original visual aspect. This means dismantling the retablo, conserving damaged wooden parts or replacing those that cannot be repaired, reconstructing the original structural system, removing the panel paintings to perform a conservation treatment that best reinstates their full aesthetic value, and reassembling the altarpiece.

The case for disassembly holds that because the retablo's original structural system had worked well in this seismically active area for a very long time, the stability of the retablo is best served by correcting its existing structural deformations and designing and installing a new support structure that better conforms with the original materials of the retablo and protects it during future earthquakes. It is argued that this approach considers the aesthetic, historic, and religious values of the altarpiece.

The argument against disassembly is that while this approach maintains the religious significance of the retablo and strengthens its aesthetic value, authenticity and some historic values would be greatly compromised.

From the beginning of the project, the desire of the Yanhuitlán community has been to maintain the beauty of the retablo and to secure it structurally. From the community's standpoint, the appropriateness of in situ conservation or dismantlement remains an issue for professionals to discuss and resolve, as long as the religious and cultural significance of the retablo is respected. The people of Yanhuitlán have worked closely with the conservation team,



One of the panel paintings, *The Ascension* (attributed to Andres de la Concha, late 16th century) and some of the ornate framework. Minor previous restoration is visible on the vertical separation of the panel boards. The backboard behind the left column has bowed, a deformation caused partially by a damaged column in the lower half of the retablo. The metal band around the frieze above the left column is from an early remedial anchorage system. Photo: Ubaldo Enríquez Manrique.

and they continue to be eager to participate fully in the effort to preserve and maintain a treasured and revered part of their community.

The Yanhuitlán project has already produced extensive documentation and structural analysis that contribute to our understanding of the architecture, materials, and construction methods of colonial retablos in Mexico. It is expected that as the conservation team works through the question of whether to dismantle or conserve in situ the Yanhuitlán retablo, the project will prove valuable in stimulating and guiding greater exploration of ways to preserve these remarkable elements of our cultural heritage.

**Françoise Descamps is a GCI senior project specialist; Valerie Dorge is a GCI project specialist; and Giora Solar is the GCI's group director of Conservation.**

# Yanhuitlán Project Participants

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## Yanhuitlán Community

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## The Getty Trust

### The Getty Conservation Institute

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### The J. Paul Getty Museum

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Valerie Dorge

# Harnessing Digital Technology for Conservation Documentation

By Rand Eppich and Francesca Piqué



An example of graphic representation of some of the conservation information recorded for the central panel of *The Last Judgment* mosaic on the Golden Gate of St. Vitus Cathedral in Prague Castle. At the end of the 19th century, the mosaic was cut into 273 sections and removed from the cathedral facade. The drawing indicates the edges of the detached sections, as well as areas of original and new tesserae and traces of the original gold gilding. The mosaic's conservation is a collaboration between the Office of the President of the Czech Republic and the GCI.

IN A SMALL COMPUTER LAB at the Getty Conservation Institute, Irene Sen and a fellow conservator are discussing the GCI's work on *The Last Judgment* mosaic in Prague. Located on the exterior of St. Vitus Cathedral, the 14th-century glass mosaic has suffered from pollution and the extremes of the climate in the Czech Republic. Sen, a GCI research fellow, sits down at a computer keyboard and opens an electronic file that contains all the graphic information concerning the mosaic. An image of the multicolored mosaic appears on the monitor, followed by an overlay of graphic and written notes on the mosaic's condition. The fine details are not apparent at first, so Sen enlarges an area of the mosaic near the

representation of the central figure of Christ in judgment. The discussion turns to previous conservation interventions. Sen moves the mouse over a button that controls layered information about the mosaic. After a few clicks, most of the information disappears, except for red lines that cross the mosaic. Sen explains that these lines show where the mosaic was cut to be detached in the late 19th century. She highlights the area and selects "print"; soon she has a color print of the part of the mosaic under discussion.

As in many of the GCI's recent field projects, *The Last Judgment* mosaic project's graphic documentation is being carried out on site in a way that can be easily transferred to digital form. Photo-



The conservation team at work on digital documentation of 16th-century wall paintings by Italian artist Filippo Paladini, located in the Paladini Chapel of the Grandmaster's Palace in Malta. Graphic information was collected traditionally and transferred to digital form directly in front of the paintings. This reduces mistakes that occur when data transcription is carried out away from a site. The documentation is part of a collaboration between the Valletta Rehabilitation Project, the Courtauld Institute of Art, and the GCI. Photo: Ray Bondin.

graphic and computer technology, often in conjunction with traditional methods of documentation, now provide the basic tools for the recording and manipulation of data concerning the original technique, conservation history, and conservation intervention of an object, mural, mosaic, or site, as well as its existing state of conservation.

The center of the GCI's computer documentation work is the digital lab, which houses imaging equipment and computers loaded with some of the latest software programs. Created over three years ago by the Institute's Conservation group to promote digital documentation in field campaigns, training, and research.

When a site—which might contain mosaics, murals, and architectural elements—or an art object is selected for conservation, the first task of the conservation team is to carry out an in-depth examination. This includes the graphic recording of the site or object's condition. By studying all aspects of a site or object, one acquires an accurate understanding of its present state (including the nature and extent of deterioration), previous interventions, the original technique, and the effects of past damage.

Condition recording is an essential component of a conservation project. It provides the basis of knowledge for project management, investigation, and the development of a conservation plan. Information gained from condition recording supports condition assessment, enables cost analysis in project management, and guides the use of resources. It also provides information for fundraising, the development of partnerships, and publishing.

In addition, condition recording helps identify needs and priorities for investigation and treatment planning. Conservators gain significant understanding of an object or site while recording its features. The type, extent, and location of damage are crucial to understanding the processes and causes of deterioration; they also will indicate the need for additional investigation. Furthermore, in-depth examination reveals the effectiveness of methods and materials used in previous interventions.

During treatment, graphic condition recording is used as a reference and as a basis for annotation. It remains a key document for the future, providing a foundation for evaluating changes in the conserved object or site.

In the past, all this information was collected in great detail, in notebooks, on paper, and on acetate. It was, however, tedious and time consuming to modify information in this form and to duplicate, disseminate, manage, and store the data. The use of computer technology to record and manipulate the documentation allows greater ease and flexibility in working with the variety and amount of information required and collected in a conservation project.

An example of this was the recent condition assessment of the 16th-century *retablo* in Yanhuitlán in Oaxaca, Mexico (see p. 16). The *retablo*, a wooden altarpiece approximately 19 meters in height, is located in the apse of the Church of Santo Domingo. Considered one of the country's most important examples of colonial art, it has suffered damage from water, insects, and seismic activity. In the early stages of the project, the conservators decided that as part of the assessment phase, the condition recording would be done in digital form.

During a documentation campaign, Irene Sen installed a desktop computer—with Spanish versions of AutoCAD and Adobe PhotoShop—in the dimly lit church. Balancing on scaffolding, the documentation team first recorded the condition information (i.e., cracks, paint loss, flaking, insect damage) in the traditional manner by marking on acetate sheets over photographs of sections of the *retablo*. Conditions were then redrawn in the computer over onscreen digital photographs of the altarpiece.

The electronic files created by Sen consist of images and graphic notations containing conservation information and text. These sets of information are overlaid to create a combined visual and written record of the problems of the *retablo*—a record that can guide the development of a conservation strategy.

The use of digital technology is not always convenient in the field. In Yanhuitlán, obstacles to the computer's use included an irregular power supply, copious amounts of dust, and the need to halt work during church services. But enduring these difficulties

was worth it. Using the computer in the field as a tool in conservation assessment enabled the project team to create a detailed and comprehensive digital record of the state of the retablo, eliminating any possible mistakes that could have occurred during transcription of information, had it been done far away from the altarpiece.

As part of the retablo's condition recording, Sen trained Javier Salazar of Mexico's Instituto Nacional de Antropología e Historia (INAH) in the use of this technology. In two weeks, despite interruptions, Sen and Salazar made a good start on collecting information in digital form. After Sen's return to the GCI, Salazar remained on site and completed the condition recording.

Conservators at the GCI who have used computer-aided tools find that digital documentation records offer all the advantages of digital formats, including infinite reproducibility. They can be edited, duplicated, stored, shared, and even e-mailed. This can all be done more easily and cost-effectively than if the records were in paper form. In addition, data analysis is greatly improved by the use of computer-based technologies, which offer capabilities impossible to achieve in exclusively manual systems.

On the Mediterranean coast of Israel, as part of a mosaics project undertaken by the GCI and the Israel Antiquities Authority, digital condition recording is being used at the ancient site of Caesarea to track changes in the condition of five mosaics. The mosaics, which are vulnerable to the damaging effects of rain, wind, salt, and heavy tourist traffic, are being used to test and evaluate four different protective measures. As part of the test, conservators examine the mosaics monthly and update the condition record for each mosaic. This procedure is easily accomplished when the data are in digital form. Furthermore, because the computerized graphic data are quantifiable, the digitized condition record will show more precisely the comparative rates of deterioration and the efficacy of the protective measures.

Because technology is developing so rapidly, the GCI digital lab continues to review new and existing technologies and their possible applications to conservation. Determining the best possible method for conservators to record in graphic form is another element of the lab's research. For example, the most efficient way to obtain a digital document on site is to record on the computer directly. However, when it is not practical for laptop computers to be brought into the field, the digital lab has developed protocols for traditional recording that allow easy transfer of data and images into electronic form.

By studying new software, hardware, and techniques, and by conducting experiments, the digital lab seeks to improve the efficiency of conservators by providing information on the benefits and potential pitfalls of selected tools.

Last May, Evin Erder, a GCI research fellow, used a total station (a survey instrument that measures distances and angles electronically) to gather data on the Tel Dan gateway, a 1800 B.C.E. mud-brick arch structure in northern Israel. It is among the earliest known examples of an arched structure, and although protected by a shelter, it continues to deteriorate. Using the instrument, Erder was able to painstakingly record cracks and the deformation of the facade in three dimensions. These data have been combined with a photogrammetric computer model to provide a complete picture of the gate. During future monitoring, the information can help determine if the cracks are changing and if material is being lost from the structure. The innovative use of this methodology in the Tel Dan gateway project is an effort to establish more effective techniques for recording three-dimensional data on heritage sites. These data provide a complete picture of the structure that would otherwise be impossible if only plans, sections, and elevations were used. The data can also be used to help recreate how the arch might have appeared when first constructed.



**GCI project specialist Francesca Piqué—at the site of Horvat Minnim in Israel—graphically recording conditions onto transparent sheets positioned over photographs of the mosaic. The sheets were then scanned to create layers of information, in digital form. The recording, part of the assessment of eighth-century mosaics in the Umayyad Palace, is a component of a collaborative project between the Israel Antiquities Authority and the GCI. Photo: Frank Long.**

Choices about how to apply digital technology to conservation documentation should be guided by the specific needs and purposes of a project. Depending upon the resources available and the characteristics of the site environment, a variety of more or less sophisticated tools—ranging from traditional pen and paper, through laptops in the field, to digital photogrammetry—can be employed. In every instance, planning prior to field campaigns is essential to best gather the information for effective use. Because the bulk of documentation information on GCI projects is ultimately transformed into digital data, a close working relationship has developed between field conservators and computer specialists on staff. This collaboration has greatly enhanced the development and improvement of methods for graphic recording.

The integration of digital tools into the conservation documentation process is still in its early stages. Nevertheless, it holds the promise of vastly increasing the body of information easily available to conservation teams in the field, in the lab, and for coordination and comparison between similar projects, thereby facilitating the effectiveness of their work.

*Rand Eppich is a research fellow and Francesca Piqué is a project specialist in the GCI's Conservation group.*

## Members of the GCI Staff Involved with the Digital Lab

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Rand Eppich research fellow

Evin Erder research fellow

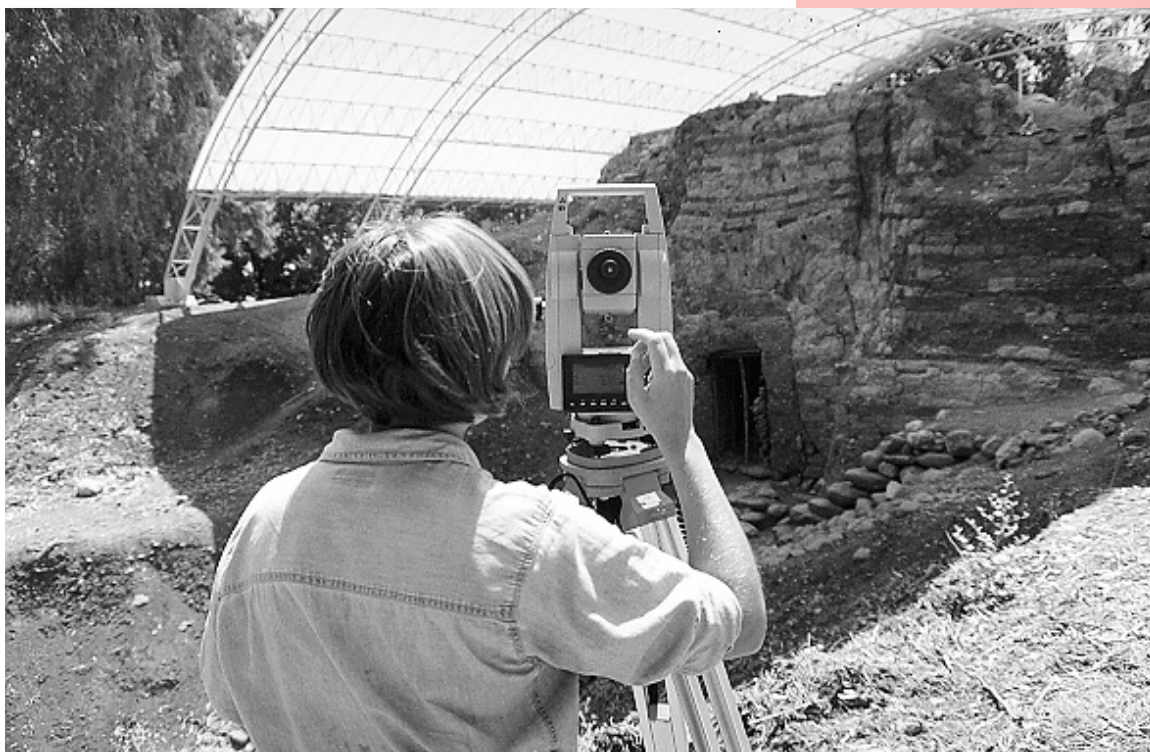
Cynthia Godlewski research associate

Christopher Gray senior project specialist

Gaetano Palumbo project specialist

Francesca Piqué project specialist

Irene Sen research fellow



**GCI research fellow Evin Erder using a total station to record three-dimensional information on the location of cracks and other conditions of the 18th-century B.C.E. mud-brick gateway at the site of Tel Dan in Israel. The data collected in this precise way can be used to monitor changes in the gate. The documentation was part of a project of the Israel Antiquities Authority and the GCI. Photo: Rand Eppich.**



## Maya Initiative

This spring, the GCI's Maya Initiative began its activities at Joya de Cerén, a pre-Hispanic Maya farming community destroyed by volcanic eruption about 1,400 years ago. In March and June, the GCI—in partnership with El Salvador's national cultural authority, Concultura (Consejo Nacional para la Cultura y el Arte)—undertook two campaigns to increase documentation of the site in order to develop a site management plan further. The plan will cover the conservation of the site, including immediate treatment, maintenance, and monitoring; it will also address the issues of visitor facilities and how the site will be presented. The planning and research methodology being used at the site is designed to serve as a model for other Maya sites in the region.

GCI work at Joya de Cerén included preparation for conservation assessment of the earthen structures at the site, including identification of deterioration phenomena, their location, and their extent. An evaluation of the site was also undertaken in advance of environmental monitoring. In addition, the project team corrected existing drawings and maps of the site and will be recording some of that new information in AutoCAD format.

In September, planning will take place for a large meeting of all the parties who have an interest in the site. The meeting's participants—including cultural

authorities, members of the local community, and tourism officials—will work to identify and agree upon the values that are part of Joya de Cerén.

Working with the Instituto Hondureño de Antropología, the GCI Maya Initiative has also begun work at Copán, a city in western Honduras that reached its peak in the early ninth century during the Maya Classic period. The project there is focusing on the conservation of the hieroglyphic staircase at the site. In addition to studying stone samples taken from the staircase early this century (now in the collection of the Peabody Museum), the project team during this spring and summer collected samples from the staircase for analysis that can better characterize the materials and their current state of deterioration. Team members also examined the site to determine its environmental monitoring needs and studied different methods of documenting this important staircase, whose many glyphs form the longest Maya text in existence.

*Maria Teresa Diaz Coloch*



## Mosaics In Situ



Cynthia Godlewski

During the last two weeks of April 1999, fieldwork took place in Caesarea, Israel, as part of a collaborative project on the conservation of mosaics in situ undertaken by the GCI and the Israel Antiquities Authority (IAA).

One of the components of the project's research program is a three-year mosaic comparative exposure test. During the April campaign, the project team continued to develop plans for this test, which will be implemented in the fall of this year. The objective of the test is to document, understand, and quantify the impact of maintenance following selected conservation interventions on the mitigation of mosaic deterioration.

During the April mission, the team finalized several of the test implementation components, as well as the monitoring and maintenance plan. The mission included a training session for IAA and Israel National Parks staff on digital graphic documentation methodology, necessary to support the test needs for regular and systematic recording of changes in the mosaics' condition. As part of the training practice, graphic conditions recording was carried out on one of the test mosaics.

## GCI Book and Video Honored

The GCI publication *Mortality Immortality? The Legacy of 20th-Century Art* has recently received several awards. The book—based on a GCI conference on the preservation of contemporary art, held at the Getty Center in March 1998—was a finalist in the fine art category of the 1999 Independent Publisher Book Awards. This spring, the volume also won second prize in the book category of the 1999 American Association of Museums Publications Design Competition.

In *Mortality Immortality?*, professionals from a variety of disciplines offer individual perspectives under the following headings: “Is Contemporary Art Only for Contemporary Times?,” “Present and Future Perceptions,” “The Challenge of Materials,” “The Art Ecosystem,” and “Who Is Responsible?” Authors include celebrated artists David Hockney, Judy Chicago, and Bill Viola; philosopher Arthur Danto; collectors Clifford Einstein and Agnes Gund; and museum professionals Roy A. Perry, head of conservation at the Tate Gallery, London; James Coddington, chief conservator at the Museum of Modern Art, New York; Peter Galassi, chief curator of photography at the Museum of Modern Art; and John Hanhardt, senior curator of film and media arts at the Solomon R. Guggenheim Museum, New York. The foreword is by Mildred Constantine, formerly a curator at the Museum of Modern Art.

In December 1998, *History Told on Walls*, the GCI video documentary on the royal bas-reliefs of Abomey, won the Prix Coup de Coeur at the 1998 International Audiovisual Festival/Museums and Heritage, organized by AVICOM, the audiovisual arm of the International Council of Museums (ICOM). The documentary—which had previously won the Gold Award for documentaries at the 1997 Houston International Film Festival—is the story of the successful collaboration between the Republic of Benin and the GCI to preserve the heavily damaged bas-reliefs that once adorned the Salle des Bijoux, or Hall of Jewels, part of the official palace of King Glélé in Abomey. (A book on the bas-reliefs and their conservation, *Palace Sculptures of Abomey*, will be published by the Getty later this year.)

## Meeting on Conservation and Building Codes in Los Angeles

A recurring concern of those working in conservation in Los Angeles has been the perceived lack of clarity and limitations of the city's building codes. In an effort to increase understanding of the true extent of the problem, the GCI organized a one-day roundtable discussion in July 1999, during which experts from the public sector, private development, and academia discussed building codes as they relate to conservation practice in the City of Los Angeles.

A GCI objective in organizing the meeting was to determine whether the participants could achieve consensus concerning the nature and identity of the issues surrounding the impact of building codes on the preservation and reuse of historic structures. The discussions raised the need for more education, training, conservation awareness, and dissemination of information concerning codes related to historic preservation. There was general concurrence that while many of the tools necessary to meet these needs already exist, more can be done to clarify information already available.

In the wake of the meeting, the GCI will continue to study ways that it can contribute to the efforts to preserve historic structures in Los Angeles.

### Meeting Participants

**Kenneth Bernstein**

Director of Preservation Issues  
Los Angeles Conservancy

**Richard Conrad**

Executive Director  
State Historical Building Safety  
Board

**Steadie Craigo**

Senior Restoration Architect  
Office of Historic Preservation

**Melvyn Green**

Structural Engineer  
Melvyn Green and Associates, Inc.

**Peyton Hall**

Architect  
Historic Preservation Group

**Brenda Levin**

Architect  
Levin and Associates

**Jeff McIntyre**

Zoning Engineer  
Building and Safety Department

**Daniel Rosenfeld**

Senior Vice President  
LaSalle Partners

**Don Spivack**

Deputy Administrator  
Community Redevelopment Agency

**Rand Eppich**

Research Fellow  
Getty Conservation Institute

**Christopher Gray**

Senior Project Specialist  
Getty Conservation Institute

**Carol Jeffries**

Information Management  
Consultant  
Getty Conservation Institute

**Randy Mason**

Senior Project Specialist  
Getty Conservation Institute

**Ron Romo**

Manager, General Maintenance  
J. Paul Getty Trust

**Chris Seki**

Project Management Assistant  
Getty Conservation Institute

**Giora Solar**

Group Director, Conservation  
Getty Conservation Institute

**Tim Whalen**

Director  
Getty Conservation Institute

## Building an Emergency Plan

*A Guide for Museums and Other Cultural Institutions*

Compiled by Valerie Dorge and Sharon Jones

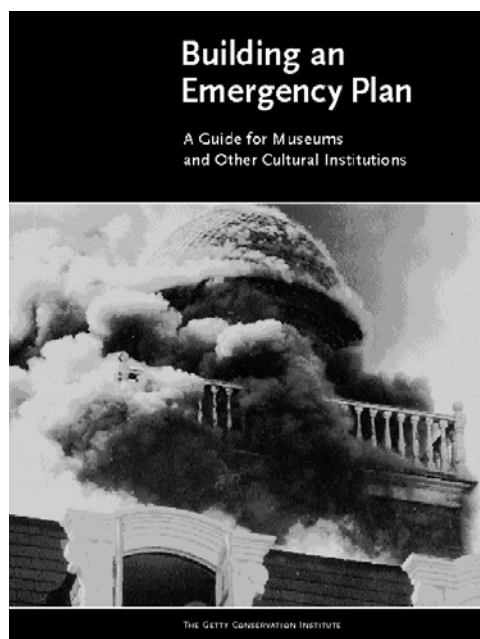
When an emergency strikes, is your cultural institution prepared to protect the people on site, the premises, and its collections from harm? *Building an Emergency Plan* provides a step-by-step guide that a cultural institution can follow to develop its own emergency preparedness and response strategy.

This workbook is divided into three parts that address the three groups generally responsible for developing and implementing emergency procedures—institution directors, emergency preparedness managers, and departmental team leaders—and discuss the role each should play in devising and maintaining an effective emergency plan. Several chapters detail the practical aspects of communication, training, and forming teams to handle the safety of staff and visitors, collections, buildings, and records.

Emergencies covered include natural events such as earthquakes or floods, as well as human-caused emergencies, such as fires that occur during renovation. Examples from the Barbados Museum and Historical Society, the Museo de Arte Popular Americano in Chile, the Mystic Seaport Museum in Connecticut, and the Seattle Art Museum show how cultural institutions have prepared for emergencies relevant to their sites, collections, and regions.

Conservator Valerie Dorge is project specialist with the Conservation group at the Getty Conservation Institute. Sharon Jones is a technologist and a former journalist based in San Diego.

**208 pages, 8½ x 11 inches**  
**8 b/w illustrations and 24 line drawings**  
**ISBN 0-89236-551-x, paper, \$39.95**



## AATA Update

At the beginning of July, the GCI and the International Institute for Conservation of Historic and Artistic Works (IIC) met for substantive discussions over two days on future developments of *Art and Archaeology Technical Abstracts*. Recently, this important resource for the profession has been under review within the GCI in an effort to improve both the quality of its information and its method of distribution. Issues covered at the meeting were the GCI/IIC relationship in the past and the role that the IIC has played, and will continue to play, in the operation of *AATA*; questions of audience; content coverage; and editorial process and policy. Additionally, an important discussion was held regarding the international group of abstractors, its recognition, and the critical function and extraordinary contribution that it plays in contributing to the publication. The nature of the abstracts, special supplements, copyright issues, marketing, and other matters were also debated.

As a result of these discussions, it has been agreed that the IIC will continue its involvement with the publication, which will undergo a change of name, most probably to the *Getty Index to Conservation Literature*. Importantly, the decision was taken to develop a Web-based interface and a CD-ROM product for the publication. This will include producing a quick-start guide and brochure, launching an effective marketing campaign, and redefining the role of

regional editors, as well as expanding the scope and coverage of the publication. An advisory group will be created to provide input on the scope and content, and membership for this group will include a standing member from the IIC governing board. There was near unanimity regarding the future of *AATA* in an electronic medium of dissemination, since this will allow better and faster access to relevant information. Of concern was the problem of providing information to regions where Internet access is limited or nonexistent. This will receive consideration, and every attempt will be made to provide broad access to the publication.

In the interim, volume 35, numbers 1 and 2, will be published in traditional hard copy under the name *AATA*; number 1 is due to print in August 1999, and number 2 should be available early in the year 2000.

The Web-based publication, with its many attendant issues still to be resolved, includes the possibility of regional centers for document delivery and searching, and a method of payment for subscription. Electronic distribution is planned for late in the year 2000. In the coming months, as analysis and planning develop, information will be regularly disseminated to the field.

## Participants in the *AATA* Meeting

### David Bomford

Secretary-General, IIC  
National Gallery, London

### Joyce Hill Stoner

Professor and Paintings Conservator  
Winterthur/University of Delaware  
Program in Art Conservation

### Norman Tennent

Associate Scientist  
Netherlands Institute for Cultural  
Heritage

### Giorgio Torracca

Associate Professor  
Dipartimento di Ingegneria Chimica  
Università "La Sapienza"  
Rome

### Marie Christine Uginet

Head Librarian, ICCROM  
Rome

### John Winter

President, IIC  
Freer Gallery of Art  
Smithsonian Institution  
Washington, D.C.

### Timothy P. Whalen

Director  
Getty Conservation Institute

### Neville Agnew

Group Director, Information and  
Communications  
Getty Conservation Institute

### Julie Howell

Manager, Information Center  
Getty Conservation Institute

### Murtha Baca

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and Research  
Getty Research Institute

### Candace Borland

Program Officer, Director's Office  
Getty Education Institute

### Patrick Callahan

Marketing Manager  
Getty Trust Publication Services

### Ben Davis

Manager of Electronic Publications  
Getty Trust Publication Services

### Linda Kincheloe

Research Associate, Information and  
Communications  
Getty Conservation Institute

### Kathleen McDonnell

Special Assistant to the Executive  
Vice President  
J. Paul Getty Trust

### Marta de la Torre

Group Director  
Getty Conservation Institute

## Sebastian Moves to Getty Trust

After 12 years of service with the Getty Conservation Institute, Rona Sebastian has been given a new role by Stephen Rountree, Getty Trust executive vice president. On July 1, 1999, she began working for Rountree, helping to develop an Office of Strategic Partnerships for the Getty at large. The office will explore ways to develop new partnerships and build upon existing collaborations and relationships to enhance appreciation and support for the arts.

Rona has had a long career with the Getty. She first came to the Trust in 1985, when she was hired as the administrator for several Getty programs, among them the Grant Program, the Museum Management Institute, and Trust Public Affairs. Two years later she joined the GCI as its administrator, and in 1989, she was appointed associate director for administration at the Institute. During 1990, she was acting co-director of the GCI, following the departure of the Institute's first director, Luis Monreal. Rona continued to serve as an associate director under his successor, Miguel Angel Corzo. In 1997, she was named the GCI's deputy director, a position she held until her recent departure for the Trust.

"During my tenure at the GCI, Rona has been a loyal and thoughtful colleague," said Timothy Whalen, who assumed the directorship of the GCI in December 1998. "I've very much appreciated Rona's support and hard work. I wish her every success with her new assignment."

"My 12 years at the GCI have been extraordinary," Rona noted. "I feel fortunate to have had the opportunity to work with organizations and individuals around the world who deeply value the world's cultural heritage and who share a common concern for its long-term preservation."

## Francesca Piqué Project Specialist, Conservation



Dennis Keeley

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## Kathleen Gaines Group Director, Administration



Dennis Keeley

Born in Florence, Italy, Francesca Piqué grew up in a 16th-century villa that has been in her mother's family since 1759. Living in these historic surroundings and having parents with a strong appreciation for art no doubt helped shape her early interest in conservation. She recalls at the age of 16 watching a family friend, noted Italian conservation scientist Giorgio Torraca, working in the Cathedral of Torcello, Venice, and thinking that this was the sort of work she wished to do.

After Francesca completed high school, following Torraca's advice, she began studies in chemistry as the basis for a career in conservation sci-

ence, and she searched for hands-on conservation training as well. While attending the University of Florence, she researched wall painting techniques in the laboratory of Leonetto Tintori, a renowned wall paintings conservator. In 1988, through Tintori, she learned of the three-year post-graduate wall paintings conservation course offered at the Courtauld Institute of Art, University of London, which was at the time co-organized along with the GCI. It was at the Courtauld that she met Sharon Cather, who, with Torraca, remains a mentor. As part of her Courtauld studies, Francesca did fieldwork at sev-

eral sites in England, as well as in Florence under the supervision of the Opificio delle Pietre Dure.

Francesca graduated from the Courtauld in 1991 and simultaneously received her degree in physical chemistry. The following year she earned a master's degree in science for conservation from the Courtauld, the result of work she did at the Yungang grottoes in China during a 10-month internship with the GCI Scientific department. In 1993 she joined the GCI as a research fellow in Special Projects. Her first assignment was research on the tomb of Tutankhamun. She went on to a documenta-

tion, conservation, and training project with the government of Benin involving earthen bas-reliefs at the Royal Palaces of Abomey. She also worked as a member of the team on the conservation of the hominid trackway in Laetoli, Tanzania, and on the conservation of *The Last Judgment* mosaic in Prague. She has been a permanent staff member since 1996. She is currently part of the Institute's projects on China's Mogao grottoes and on the conservation of mosaics in situ. In the future, she hopes to combine more time for scientific research with her fieldwork. ■

Born in Los Angeles, Kathleen Gaines was raised in the suburb of Torrance. Her parents encouraged an interest in the arts by taking her to theater and dance performances. She was drawn to ballet, and from the ages of 8 to 16, she took ballet instruction six days a week.

After a first undergraduate year at California Lutheran College, she transferred to the University of San Diego, majoring in business administration. At the urging of her father—a management consultant for manufacturers—she concentrated on accounting. Following graduation, she returned to Torrance, taking a job as a staff auditor with the consulting and accounting firm of Arthur Anderson & Com-

pany. Kathleen began work in the small business division, where her first client was the then-modest Chiat-Day advertising agency, whose own clients included Apple Computer and Nike. After rising to a senior auditor, she was promoted in 1985 to assistant director of administration in the audit department, a position that appealed to her interest in work focused on people. There she concentrated on human resources and staffing issues, including development of an effective approach for allocating staff to company clients in Southern California, Nevada, and Hawaii.

In 1993, with a one-year-old child at home and her immediate boss retiring, Kath-

leen decided she wanted a career change. Working with an executive search firm, she interviewed with two organizations. The first was a company that managed the business affairs of celebrity singers. The other turned out to be her preference—the GCI. In January 1994, she began work as the GCI's manager of administration. Her first on-the-job test was the Northridge earthquake, which occurred two weeks after she started; fortunately, the Institute's facility was spared serious damage.

Kathleen's first years at the Institute were devoted extensively to the GCI's move to the Getty Center, and she enjoyed the challenge of facilitating the transition and fur-

ther integrating the GCI's operations with those of the Getty Trust as a whole. In 1998 she was promoted to the Institute's director of administration. As she had at Arthur Anderson, she continues to enjoy working with bright, intellectually stimulating colleagues. Her current responsibilities include assisting the GCI's leadership to manage organizational change—a concept with which she is quite familiar, as she and her husband raise their now-seven-year-old daughter. ■

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