

The background image shows the interior of an ancient Egyptian temple. Large, cylindrical columns are covered in hieroglyphs and carved figures. The architecture is made of light-colored stone. In the center, a person stands in a doorway, looking out at a landscape with a small town and mountains under a clear blue sky. The lighting is warm, suggesting sunlight streaming in from the opening.

CONSERVATION PERSPECTIVES

THE GCI NEWSLETTER

SPRING 2018
ARCHAEOLOGICAL CONSERVATION



The Getty Conservation Institute

A Note from the Director



Photo: Anna Flavin, GCI

The world's archaeological remains constitute humanity's collective memory, comprising the physical evidence of our journey on the planet—from the bones and tools of our earliest ancestors millions of years ago to the ruins and artifacts of more recent history. Preserving these manifestations of the past is critical for understanding not only how human civilization developed but also who we are today and the historical forces that shaped us.

The Getty's engagement with archaeology originated with J. Paul Getty himself, who was fascinated with the ancient Mediterranean. His interest initially manifested in collecting antiquities, and it culminated with building what is today the Getty Villa, modeled after the Villa dei Papiri in Herculaneum, Italy.

For the Getty Conservation Institute, the conservation of archaeological places and material has been central to its mission since its founding over thirty years ago. The GCI's first two field projects, begun in the 1980s, were at significant archaeological sites—the ancient Egyptian tomb of Queen Nefertari in the Valley of the Queens and the Roman Orpheus mosaic at Paphos, Cyprus. Since then, we have gone on to invest time, expertise, and resources toward advancing archaeological conservation practice through research, training, field projects, workshops, conferences, publishing, and dissemination.

Recent research on archaeological material has included the GCI's Athenian Pottery Project, which is studying the materials and techniques employed by artisans in antiquity to create the iconic red and black figure pottery of ancient Athens.

That enduring interest in archaeological conservation prompted this edition of *Conservation Perspectives*. We lead off with a feature article by Tim Williams, a member of the faculty of the Institute of Archaeology at University College London, who provides a twenty-year perspective on advances and changes in the conservation of archaeology, as well as the challenges still confronting the field. The feature is followed by two articles describing recent major collaborative archaeological conservation projects undertaken by the GCI. The first article, authored by GCI staff members Jeanne Marie Teutonico and Leslie Friedman, sums up the objectives and outcomes of the ten-year MOSAIKON initiative, focused on the conservation and management of archaeological mosaics in the Mediterranean region; it also describes the opportunities now created by that work. The second, written by the GCI's Neville Agnew and Lori Wong, offers an overview of a project at the tomb of Tutankhamen in the Valley of the Kings, where the Institute has partnered with Egyptian authorities to conserve the tomb and its wall paintings. The last article is by Robert Bewley, director of the Endangered Archaeology in the Middle East and North Africa project, who describes the project's efforts to document archaeological sites in the region with the aim of improving conservation of cultural heritage by providing reliable information for decision-making. This edition closes with a thoughtful and insightful roundtable discussion on archaeology and conservation education with three professionals long involved in teaching—Chris Caple, Ioanna Kakoulli, and Clemente Marconi.

Preserving our archaeological heritage remains a priority for the GCI. In our programmatic work, we are committed to forging a sustainable future for the world's archaeological heritage, recognizing that humanity's fullest understanding of itself depends on it.

A handwritten signature in black ink, which appears to read "T. Whalen". The signature is fluid and cursive, with a long horizontal stroke at the end.

Timothy P. Whalen
John E. and Louise Bryson Director

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ON THE COVER

The Ramesseum, funerary temple of the pharaoh Ramesses II. Located on the Nile's West Bank, the temple dates to the thirteenth century BCE. Photo: Martha Demas, GCI.

THE CONSERVATION AND MANAGEMENT OF ARCHAEOLOGICAL SITES



A TWENTY-YEAR PERSPECTIVE

BY TIM WILLIAMS

The past two decades have seen globalization, rapid societal change, significant global economic fluctuations, huge increases in tourism, and massive technological innovations. New approaches to the conservation and management of archaeological sites reflect the profession's response to these conditions, as it considers the complexity of societal context; the range of values and rights involved in heritage decision-making; and technological, scientific, and traditional ways to document and sustain archaeological heritage. Nevertheless, despite recent advances in practice, archaeological sites face increasing challenges from development, climate change, tourism, insufficient management, looting, conflict, and inadequate governmental resources.

CHANGES IN THINKING

The first Burra Charter was adopted nearly forty years ago, and over the intervening period, through various editions, its basic principles and procedures for heritage places have had a profound impact on the international practice of archaeological heritage management. This influential document did not prescribe the techniques to be used or the manner in which a place should be cared for but rather established a process that set cultural significance, including its meaning to people, at the heart of the endeavor. It helped pave the way for widespread adoption of values-based management and the involvement of various stakeholder groups, and it asked fundamental questions regarding local community participation in archaeological heritage management. Values-based management recognized that values are attributed by people, are not necessarily intrinsic to the physical remains of the past, and are changeable, not static, driven by opinions, ideas, perspectives, and new circumstances. This conception raised the likelihood that values for any

Villa Romana del Casale, Sicily. The site's iconic original shelter, designed in the 1950s by Franco Minissi, had numerous issues with conservation performance, lighting, and visitor circulation. The new shelter seen here, designed by Gionata Rizzi, uses advances in materials to provide a more effective conservation performance while enhancing the idea of the original space and improving the visitor experience. Photo: Roman Babakin / Alamy Stock Photo.





Mes Aynak in Logar Province, Afghanistan, once an important Buddhist Silk Road settlement. Large-scale copper mining planned for the area now threatens the site. Whether the archaeology, potentially a major tourist attraction if and when the region stabilizes, can be protected and managed while allowing mining to take place is a matter of current debate. Photos: David Fallon.



archaeological site or landscape will be multiple and often in tension. Recognition of the need to sustain values and not simply fabric has serious implications for conservation, raising issues about the universality of conservation principles and the need to manage change. The impact of a values-based approach is reflected in a number of influential publications regarding archaeological site management.

Another major development was the Nara Document on Authenticity (1994), which challenged the supremacy of material authenticity and established that authenticity is never absolute, but always relative. The document also opened the way for greater consideration of the sustainable use of historic buildings and archaeological sites, and thus a wider adoption of maintenance and traditional approaches to site management.

These evolving concepts have been vital in changing attitudes toward participatory engagement and rights-based management for archaeological and heritage resources. Those setting the agenda for archaeological site preservation, including what should be “preserved for future generations,” are often those with political power—unsurprising, as participation is an act of political will. Randall Mason’s thoughtful analysis of values assessment¹ reflected the complexity with which a specific stakeholder or group could be considered “insiders” or “outsiders” in a particular decision-making process: a fluctuating status depending both on issues specific to the situation and on wider decisions regarding power and power sharing. While heritage professionals actually are seldom “insiders,” they often carry some weight in influencing decisions regarding archaeological sites, and thus they have an ethical responsibility to consider their place and power within the process.

Another major development over the past two decades has been the changing conceptualization of archaeological sites and landscapes. We have moved away from a focus on single sites and their environs to a wider vision both of landscape and of the multifaceted nature of archaeology. The discussion of cultural landscapes, cultural routes, and intangible heritage has broadened the previous focus beyond single sites and their tangible remains. All of this has

brought strengths as well as complications. For example, Europe has been quick to embrace cultural routes, as the concept worked well in supporting the current political agenda of European hegemony (something Britain sadly has turned its back on); however, it has also been advanced as a mechanism for transnational tourism and as an economic driver, with little real regard for the complexity of the evidence. It is unfortunate that the Convention for the Safeguarding of the Intangible Cultural Heritage (2003) divided the intangible from the tangible, as intangible values are also inherent in material culture. How we integrate these concerns into more conventional site-based conservation and interpretation is a challenge.

Overall, these changes and developments in the theoretical context of archaeological site management have demanded that we adopt a more holistic and strategic response. It is evident that a simple reactive response to threats is insufficient. For example, the GCI-organized session at the Fifth World Archaeological Conference (2003) addressed the need for the integration of the archaeological and conservation disciplines. In 2005 UNESCO made it mandatory for state parties to include a system for the management of properties in all dossiers for World Heritage nomination; most interpreted this to mean a management plan, but what it actually asked for was some form of management system, which offers a much more flexible approach. However, the value of traditional management systems has been only slowly recognized in this process. In the majority of cases, management planning has followed an overly formulaic implementation, often compiled by external consultants with little local engagement (even from local heritage professionals) and little desire to build capacity for sustaining the process. Examples can be cited where plans have been written in a language none of the archaeological park staff can speak—hardly conducive to having an impact on the management of the site. Fundamentally, this fails to recognize that management planning is a process, not a product. A management plan is only as good as the journey that produces it. It is about the dialogues and decision-making that occur during the process. But there are, of course, examples where an effective and participatory approach was adopted.²

RECENT ADVANCES

Archaeological site conservation has advanced substantially over the past two decades. Scientific techniques for conservation practice have developed through the application of new materials (for example, the major advances in geotextiles), combined with a new appreciation of the deterioration problems associated with the aging of some older ones (such as concrete).

We have seen major improvement in the thinking and methods related to the preservation in situ of archaeological remains. Urban development in particular has placed considerable pressure on the reburial of remains, which has led to research in appropriate strategies and materials but also raised concerns over how such buried remains can be monitored. The Preservation of Archaeological Remains In Situ (PARIS) conferences have highlighted approaches to reburial and issues regarding the importance of long-term monitoring, either directly or through proxies.

Another significant development has been advances in non-invasive documentation techniques. Satellite imagery, 3-D laser scanning, LiDAR, digital photography, photogrammetric recording, and unmanned aerial vehicles are radically changing our ability to rapidly and accurately document archaeological site condition and site setting. These data provide a platform for conservation decision-making, monitoring, and interpretative strategies. The cost of equipment and software has dropped dramatically within the last decade, making photographic point-cloud data generation in particular a low-cost and easily implemented strategy for many archaeological sites and landscapes. High dynamic range and infrared imagery are also offering new methods for documentation and site detection. Rendered models and, increasingly, augmented and virtual reality have the potential to build on all these spatial data sources to provide complex visualizations to support site interpretation.

There have been substantive advances in the approaches to the conservation and management of earthen architecture. The numerous Terra conferences—supported by the International Scientific Committee on the Conservation of Earthen Architectural Heritage (ISCEAH) of ICOMOS, the Getty, and CRAterre-EAG, among others—have highlighted the roles of documentation, monitoring, active maintenance, sacrificial material, shelters, and reburial, alongside the more difficult concept of managed decay.

Similarly, considerable work has been undertaken on the design of shelters for in situ archaeological remains. Recent

projects have demonstrated a more nuanced understanding of the need to balance interpretation and presentation with conservation performance. Shelter design has placed increased emphasis on consideration of visitor flows, visitor experience, and the potential for the presentation of material culture from excavated sites. However, those calculating capital development costs and sustainable operation and maintenance expenditures often fail to appreciate the gap between potential visitor-based revenue and ongoing expenses. Shelters bring their own maintenance and management costs; while new materials offer considerable improvements in performance (thermal, environmental, etc.), the need to effectively manage and monitor, and to plan for replacement over relatively limited life spans, often exposes the lack of sustainable planning.

At the beginning of the millennium, university-based teaching of archaeological heritage management (as opposed to conservation) was rare. However, we have seen a steady increase in the range of courses offered, with heritage management masters courses now common in a range of Asian, Middle Eastern, European, and North American universities. Perhaps most heartening have been

advances in the perception of heritage management as part of the archaeological discipline. The best archaeologists across the globe now routinely consider the consequences of archaeological excavation on archaeological resources, public and local community engagement, sustainable tourism, identities, and power—and they consider the efficacy of preservation in situ strategies at the outset of archaeological projects. Also encouraging is that heritage management is increasingly embedded in undergraduate archaeology courses. Archaeological heritage management is no longer the exclusive province of the conservator but is now perceived by many to be an ethical concern for any practicing archaeologist. This

is a necessary and fundamental shift in the discipline of archaeology.

Nevertheless, the integration of conservation and archaeological practice remains a major issue and a point of debate among practitioners and educators. Site conservation, as opposed to artifact conservation, is still poorly represented across conservation and archaeology courses in general.

CONTINUING CHALLENGES AND NEEDS

Despite major changes in thinking regarding values-based management and participation, effective implementation is still some way off. There have been broad challenges to a narrow focus on conservation, driving both the use of archaeological heritage within twenty-



Beirut, Lebanon. Archaeological rescue excavations have taken place in Beirut as part of the massive reconstruction after the civil war. The quality and scale of the archaeology has been extensive. Excavations by a team led by Fady Beayno are documenting this material before it is lost, but urban pressures mean that little is preserved in situ, and the display of what remains has been largely limited. Photo: Tim Williams.

first-century contexts and advocacy for the engagement of local communities. But there has been less progress in translating these concepts into practice. Living heritage, rights-based management, and a range of ethical issues around sustainability and development goals confront archaeological conservation and management as professionals seek to meet the demands of contemporary communities and societies while still considering the need for future generations to make their own choices. In a values-based approach, heritage professionals are not without their own values and opinions, and in an age where specialist knowledge and experience seem discounted in policy development, it is important to recognize the crucial role of advocacy for preservation and sustainable use.

The future of archaeological site conservation and management hinges on establishing it as a component of the wider issue of sustainable development, contributing to the four pillars of sustainability: environmental, economic, social, and cultural. Commercialization and the potential devaluation of local traditions are significant concerns. Indeed, cultural tourism presents a major challenge for the management of archaeological sites—but also a major opportunity. The potential income generation of international tourism is a benefit from the investment in heritage management, even in difficult economic times.³ In practice, however, much of the revenue derived from tourism, especially in developing countries, has been franchised out, leading to both “tourism leakage”⁴ and a lack of capacity, which can have an even more alienating impact on local communities.

The global economic crisis of 2008 exposed the fragility of resourcing for sites, museums, and heritage protection. Such economic considerations are often a veil for political ideologies advocating the disengagement of the state from society. The effects of heritage funding cuts in the UK, for example, are staggering, including the closure of museums, the severe decline in archaeological input to the planning process, and the failure to address the storage of archaeological archives. The loss of expertise is incalculable.

In 2009, for the first time in human history, most of the world’s population lived in urban areas. This presents a major challenge for archaeological resource management, and responses must focus on holistic, multidisciplinary, and strategic planning to enable archaeological heritage to play a meaningful role for twenty-first-century communities. Archaeology is not a hindrance but an asset in building sustainable and resilient communities. Archaeological and built heritage can make major contributions to identity building, diversity, distinctiveness, and a sense of place and belonging. In many countries, the presumption of preservation in situ without an intention to communicate, use, or engage has made archaeology seem a

mere obstacle to sustainable urban communities. Indeed, the scale of historic cities has meant that we seldom place archaeological heritage at the core of urban planning and development—but that is where it needs to be. We need to emphasize knowledge advancement, excitement, discovery, and sense of place, rather than a tired diatribe of preservation at all costs.

The interpretation of archaeological sites remains incredibly poor. It seldom articulates a holistic vision of the site, recognizing different voices or the complexity of visitors. A particular problem is its failure to engage visitors in the reasons for and the character of conservation. Restorations and reconstructions blur into the historic fabric with little comment, and the recent scale of reconstruction (not conservation or restoration) is a concerning trend. Ellis Woodman has argued that “just as Isis’s assault on Palmyra represented an attempt to wipe out one episode of Syria’s past, now the digitally produced copy promises to erase another. In a country where the reductive narratives enforced by successive leaders have resulted in so much suffering, it would be a sad irony if the solution adopted at Palmyra represented a further suppression of the complexity of Syria’s history.”⁵

An increasing number of archaeological sites are threatened by development pressures, mass tourism, armed conflict, resource

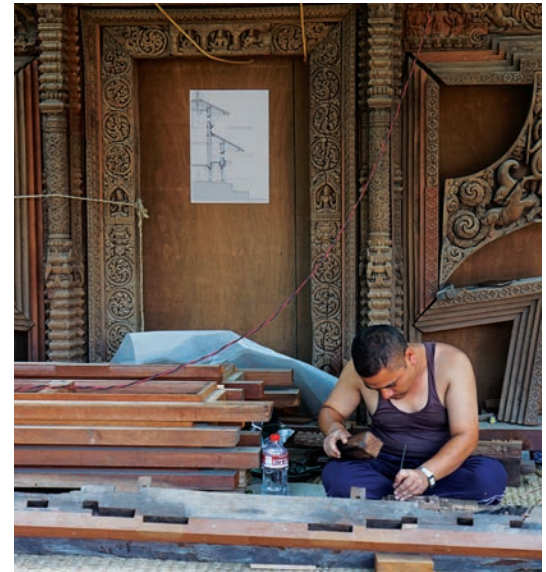
extraction, climate change, and insufficient management—and yet we do not adequately build capacity and skills. Some organizations in both the governmental and the nonprofit sectors have been working to change this, but we need a more sustained engagement with places and projects. We are not short “expert missions,” but long-term collaborations are still uncommon. We need to focus on the building of capacity in archaeological conservation and site management, and we need to think about how

we utilize apprenticeships and traditional crafts.⁶ We must think through the strategic application of archaeological and heritage data to real-world situations. We need more people—not just heritage professionals—taking on the challenge of making heritage and archaeology relevant to contemporary communities.

War remains a major issue. We must plan for resilience and recovery, and not simply bemoan what we cannot save. There have been some useful recent developments in preparation for post-conflict priority actions in Syria. However, effective planning for the role of heritage in postwar recovery is still poor. Rather than considering individual buildings, reconstruction projects must take a holistic approach, thinking in terms of urban landscapes and working with local communities to identify the priorities for reconstruction and repair. The goal is rebuilding communities, and architectural heritage and archaeology have vital roles in this. Sultan Barakat—the current director of the Conflict Management and Humanitarian



The well-preserved remains of the palatial gardens of the Nanyue Kingdom Palace gardens in Guangzhou, China. Here an extensive shelter provides a context for displaying and interpreting the formal gardens. Photo: Tim Williams.



Left: Post-earthquake reconstruction in Bhaktapur, Nepal. Good documentation provides a platform for reconstruction, ensuring that the sense of place, and its economic and social value for the local community, can be recovered. **Above: A positive outcome of the Nepalese earthquake has been the revitalization of traditional crafts.** In Patan, craftspeople are being trained in traditional wood carving to replace thousands of damaged pieces. Photos: Tim Williams.

Action Program at the Doha Institute—formulated nine critical lessons for a holistic approach to postwar reconstruction, highlighting the need for a clear vision of future recovery scenarios as seen by local groups, as much as by external players.⁷ If Aleppo, for example, is once again to become a destination for international visitors and resurrect this vital part of its economy, it must place sustainable heritage conservation at the heart of a strategic vision.

Climate change will present many challenges for archaeological site management and conservation. New Zealand has laudably established climate refuge status to support the Pacific Island communities affected by rising sea levels, but this also underscores the scale of loss that coastal heritage will suffer in coming years. Planning the documentation and salvage of archaeological resources in the coastal zone will be a priority for many countries in the decades ahead.

PRESENT AND FUTURE

The past twenty years have demonstrated that reactive responses are not an adequate means of archaeological site management. We need holistic and strategic planning. Despite substantial advances, there are increasingly poor governmental responses in many countries to the pressures on heritage from globalization, modernity, climate change, and urban expansion. The challenge for all of us is to promote the positive and vital role that archaeological heritage and its management play in contemporary society. An example of this is the excellent work of the local council and heritage agencies in Bhaktapur, Nepal, where revenue from heritage tourism, through taxation and entry fees, is channeled into supporting the community as well as the monuments, sustaining a dynamic and vibrant city with an overwhelming sense of place, where the historic urban landscape is a vital part of daily life. Values, and how we sustain them for future generations, demand that we advocate for the relevance of archaeological heritage to communities

and governments. We must use heritage to support communities, especially if we are committed to helping lift people out of poverty.

Archaeologists must engage with stakeholders to consider what is excavated, what we leave in situ, and why. The bias toward the preservation of the monumental and the elite serves an appreciation of the complexity of past societies poorly, and it should be reconsidered. Preservation of archaeological sites in situ should be coupled with a commitment to display and interpret; the fulfillment of an obligation to the future does not eliminate the responsibility to address the needs of the present. Ultimately, if we are to convince societies to preserve archaeological sites, we must become more effective at communicating the rich human history and complex values embedded in these fragile remains of the past.

Tim Williams is a member of the faculty of the Institute of Archaeology at University College London.

1. Randall Mason, "Assessing Values in Conservation Planning: Methodological Issues and Choices," in *Assessing the Values of Cultural Heritage*, edited by Marta de la Torre (Los Angeles: The Getty Conservation Institute, 2002): 5–30.
2. Some good examples of this work include Joya de Cerén in El Salvador, the archaeological zone of Monte Albán in Mexico, and Hoi An in Vietnam.
3. The eco-taxation model of the Balearic Islands is an example of this practice.
4. Tourism leakage is the process whereby part of the foreign exchange earnings generated by tourism, rather than being retained by the host country, are retained by tourist-generating countries or repatriated to them in the form of profits, royalties, repayment of loans, and imports (of equipment, materials, capital, and consumer goods) while catering to the needs of the international tourist. In developing countries, the revenue that stays in the host country is often in the form of low-paid menial work, and as little as 10–30% of tourism income is retained in country (see *Tourism and the Sustainable Development Goals—Journey to 2030* [UNWTO, 2017]).
5. Ellis Woodman, "Replicating Palmyra's Temples with 3D Printers Will Not Repair Syria's Hurt," *The Architect's Journal* (March 31, 2016).
6. The work of the Aga Khan Trust in Zanzibar and Trevor Marchand's efforts in Yemen are notable examples.
7. Anyone concerned with the role that archaeological heritage has to play in this process should read Sultan Barakat, "Postwar Reconstruction and the Recovery of Cultural Heritage: Critical Lessons from the Last Fifteen Years," in *Cultural Heritage in Postwar Recovery*, edited by Nicholas Stanley-Price (Rome, 2007: ICCROM) 26–39.

MOSAIKON 2008–2018

Objectives, Outcomes, Opportunities

BY JEANNE MARIE TEUTONICO AND LESLIE FRIEDMAN

THE MEDITERRANEAN REGION POSSESSES AN EXTRAORDINARY RANGE OF ARCHAEOLOGICAL HERITAGE, evidence of complex histories and cultures through time. Among these vestiges of the ancient past are vast numbers of mosaics from classical antiquity. Some mosaics remain on sites in their original locations (in situ), while many others are displayed in museums or languish in storage.

The conservation of this rich archaeological heritage presents enormous challenges. Mosaics are at risk from both natural and human causes. Mosaics in situ are subject to daily exposure to the elements and human impact ranging from intentional destruction and looting to uncontrolled tourism and limited resources for regular maintenance. Mosaics that have been lifted can suffer from inappropriate, often damaging, previous conservation interventions, as well as poor storage conditions. As a result, important mosaics continue to deteriorate at a rapid rate, with many lost forever.

In response to this problem, the Getty Conservation Institute (GCI), the Getty Foundation, the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), and the International Committee for the Conservation of Mosaics (ICCM) came together in 2008 to launch MOSAIKON, a strategic



MOSAIKON's second regional training course on the conservation and management of archaeological sites with mosaics, held at the Paphos Archaeological Park in Cyprus. Here, GCI instructor Tom Roby advises participants during a condition survey exercise at the Three Horae mosaic. Photo: Scott S. Warren, for the GCI.

program aimed at improving the conservation and management of archaeological mosaics in the Mediterranean region, with a particular focus on the countries of the southern and eastern Mediterranean, where needs are perhaps the greatest.

Now, ten years later, as MOSAIKON nears completion, it is a moment to stop and reflect. What are the major achievements of the initiative, and what can be done to ensure the sustainability of those outcomes over the long term? What have been the successes, the challenges, and the lessons for the future?

OBJECTIVES AND OUTCOMES

The objectives of the initiative were developed at its start, in consultation with heritage professionals and decision makers from each country in the region where MOSAIKON sought to have impact. Through a series of interrelated activities, MOSAIKON has aimed to:

- improve the knowledge and skills of those who care for mosaics;
- develop locally available and affordable conservation practices;
- strengthen the network of professionals concerned with the conservation and management of archaeological mosaics;
- disseminate and promote the exchange of information.

Building Capacity

The first objective—to improve the knowledge and skills of those involved in the conservation of mosaics—was addressed primarily through training. To achieve this goal, MOSAIKON has focused on two main groups: conservation technicians who work on both in situ and lifted mosaics, and archaeological site managers charged with the overall stewardship of archaeological sites with mosaics.

For conservation technicians, the GCI has taken the lead in delivering training for the conservation of in situ mosaics. The first course of this type was held at the site of El Jem, Tunisia, for technicians from countries in North Africa. A second course is in progress for a group of technicians from Morocco, at the site of Volubilis. These courses are organized as a series of four modules that take place over a two-year period, between which trainees carry out supervised practical work in their home countries. A number of trainees have now been identified for more advanced training, to strengthen existing skills and build local teams.

For technicians dealing primarily with lifted mosaics, a series of courses were delivered by the Centro di Conservazione Archeologica in Italy with support from the Getty Foundation. The courses trained nearly thirty participants from Syria, Jordan, Tunisia, and Libya, with about half the group completing more advanced training to enable them to become trainers themselves. A similar course has been offered at the Musée départemental Arles antique in the south of France, again with Getty Foundation support, for participants from Algeria, Lebanon, and Egypt. Advanced training for this group has taken place in Lebanon, and a final module is planned in Algeria.

For archaeological site managers—the second principal group targeted by MOSAIKON—the GCI worked with various partners to deliver three regional courses in different locations and languages. The first in this series took place at Tyre, Lebanon, in 2010 and was attended



Left: A view of the Maison de la Chasse at Bulla Regia, site of a major archaeological conservation project led by the GCI in partnership with Tunisia's Institut National du Patrimoine. Photo: Scott S. Warren, for the GCI. **Below: A GIS map of the site of Bulla Regia**, with the locations of the approximately 400 excavated mosaics shown in red. Map: created by Akhet s.r.l.

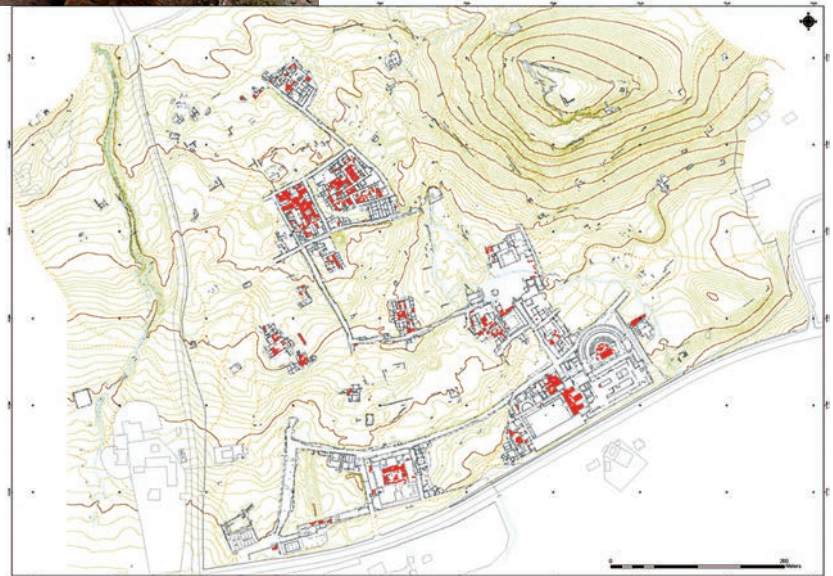
by site managers from Algeria, Egypt, Lebanon, Morocco, Syria, and Tunisia. A second course was held at the site of Paphos in Cyprus in 2014 for site managers from eleven countries, including representatives from the Balkans. A third course (taught in French) began in spring 2017 at the site of Volubilis, Morocco, and will conclude in May 2018.

Similar to the courses for site managers, MOSAIKON delivered a regional course for museum professionals responsible for mosaic collections. Led by ICCROM—with funding from the Getty Foundation—the course was held in Amman, Jordan, and covered topics ranging from preventive conservation and collections care to presentation and international legal frameworks.

In addition to these longer training programs, MOSAIKON carried out a few shorter training workshops. In Libya, approximately sixty people participated in two short workshops on conservation and site management, with support from the Getty Foundation. And in 2013, again with Getty Foundation funding, MOSAIKON partnered with the Herculaneum Conservation Project and the British School at Rome to host an international symposium on protective shelters for archaeological sites at Herculaneum in Italy. Over the course of five days, practitioners from across the region discussed how to decide when sheltering is the right solution, what factors to consider in shelter design, and how best to maintain and evaluate shelters once in place.

There will be a publication from the shelters symposium, and, longer term, the GCI is working with partners at the Israel Antiquities Authority and Historic England to develop practical guidelines for the design, construction, and maintenance of protective shelters for archaeological sites in various contexts.

In the end, approximately two hundred people from nineteen countries will have been trained through the collaborative efforts of the MOSAIKON initiative. One of the most significant accomplishments of this effort is the creation of a regional network of young professionals, who can now rely on each other for advice and support, as well as a complete set of didactic materials (in English, Arabic, and French) that other educators can access and use.



Sustainable Conservation Practices

To ensure that these training efforts are sustainable, it is essential to develop locally available and affordable methods for both in situ and museum conservation. To this end, MOSAIKON initiated two parallel activities—one focused on in situ mosaics and the other on lifted mosaics in museums and storage.

The first was a conservation project at the site of Bulla Regia in Tunisia, led by the GCI in partnership with Tunisia's Institut National du Patrimoine, to serve as a model of best practice for sites with large numbers of in situ mosaics. The project included the development of a geospatially based conservation plan for the over four hundred excavated mosaics at the site, as well as the complete conservation and presentation of one of the site's most important Roman villas.

For lifted mosaics in museums and storage, the greatest challenge to sustainability is the lack of effective approaches to backing lifted mosaics that utilize locally available and inexpensive materials as an alternative to methods employing costly materials like honeycomb aluminum panels. To address this, the GCI carried out research to examine more cost-effective methods and materials for backing lifted



Students removing modern cement joints between tesserae as part of the MOSAIKON course, Training of Technicians in Preventive Conservation and Conservation Restoration, held at the Musée départemental Arles antique in France. Photo: David Pinzon, Mosaikon-Arles 2016©mdaa acrm.

mosaics. It is hoped that some of the more promising methods to emerge from the research will be tested in the field.

Strengthening the Professional Network

A third key objective has been to strengthen the network of professionals in the region to ensure that a support system remains in place for those trained through MOSAIKON. As one of MOSAIKON's first actions, the Getty Foundation provided a grant to the ICCM to improve its governance and enhance the organization's website as an information hub, with more publications available online. The Foundation also supported delegates from underrepresented countries to attend ICCM's triennial conferences and sponsored alumni of MOSAIKON training programs to participate in specialized grant-writing workshops where they could share experiences and learn new skills. All of this has created a more secure, robust, and representative organization that can support the interests and needs of the conservation community.

Significantly, the Getty Foundation also provided support to bring together decision makers and senior heritage professionals from each of the MOSAIKON partner countries at various times throughout the life of the project. The first meeting was held in 2008 at the start of the initiative, to assess the region's needs and priorities. The second and third meetings, held as the project progressed, enabled MOSAIKON to adapt to new challenges and reassess priorities. A last meeting is planned for the end of the project, to assess outcomes and initiate discussions focusing on ways each partner country can sustain the achievements made to date and move the work forward.

Dissemination and Information Exchange

Dissemination and information exchange are crucial to a large-scale project such as MOSAIKON. Since 2011 MOSAIKON has produced an e-bulletin in both English and Arabic that is sent to over one thousand heritage professionals in the region. Nearly all of the ICCM conference proceedings are now available for free on MOSAIKON partner websites, as are didactic materials from various courses. With funding from the Getty Foundation, ICCROM is also leading a project to translate key texts on mosaic conservation into Arabic. The result will be an important body of conservation literature available for free online, thus creating a critical resource for the Arabic-speaking world.

NEXT STEPS

To date, MOSAIKON has created a critical mass of trained individuals; replicable models of best practice; strong communication networks for practitioners; and publications and didactic materials in English, French, Italian, and Arabic. As the initiative enters its final phase, the focus now is on transitional activities that will reinforce and sustain these achievements.

For capacity building, a number of follow-up activities are planned, including leadership training for select individuals that will target future decision makers. Also under consideration are the creation of several ateliers or workshops for lifted mosaics in the region, and various field schools that could provide advanced training in the area of in situ mosaic conservation and site management. Finally, we are working on a system to provide needs-based technical advice in the region.

To strengthen professional networks, the Getty Foundation will fund the final regional advisory meeting and will also offer travel support for delegates to attend the next ICCM triennial conference in 2020. For its part, the GCI is providing the new ICCM board with additional training in governance and fund-raising.

In the area of dissemination, ICCM conference proceedings will continue to be made available online. We are also considering the creation of a series of guidance notes in multiple languages that will provide technical advice on a range of topics in the conservation of in situ and lifted mosaics.

LESSONS LEARNED

Much has changed since the creation of MOSAIKON in 2008. As we near the project's completion, certain lessons have emerged. Flexibility and adaptability to very large shifts in the social and political landscape have been critical to the overall success of the MOSAIKON initiative. For capacity building, it is evident that effective training requires significant investments of time and resources. Building professional networks and communities of practice helps to ensure sustainability, and it is crucial to engage in-country leaders throughout the life of the project. The partner countries must now take an active role to ensure the long-term impact of progress made to date. Specifically, they must recognize specialized conservation skills and establish requisite job profiles, guarantee that adequate funds are annually budgeted for conservation and maintenance, and promote capacity building from within.

MOSAIKON was born from an ambitious and aspirational goal—simply stated, to significantly improve the conservation, presentation, and maintenance of archaeological mosaics in the Mediterranean region. Despite the extremely challenging political, social, and economic times we live in, MOSAIKON has continued to operate in the region and has made measurable progress toward achieving this goal. In the end, its success will be measured in great part by the professional relationships that the initiative has created and helped to maintain. In the long term, we hope that these efforts will reap substantial benefits—not just for mosaics but also for the preservation of the Mediterranean archaeological heritage in general.

Jeanne Marie Teutonico is the associate director for programs at the GCI. Leslie Friedman is a GCI project specialist.

CONSERVING THE TOMB OF TUTANKHAMEN IN THE VALLEY OF THE KINGS



BY NEVILLE AGNEW AND LORI WONG

THE CONSERVATION AND MANAGEMENT OF CULTURAL HERITAGE SITES POSE MANY COMPLEX CHALLENGES. Archaeological sites in particular are vulnerable to the environmental effects of weather, flood, and wind, and to these must be added vandalism, looting, and even tourism. For safekeeping, objects excavated from archaeological sites are typically taken to secure storage facilities where they can be conserved under controlled conditions. This is in stark contrast to in situ immovable structures and remains, which require great ingenuity to protect and make available for public display, when the significance of the site and general interest warrant the expenditure. Other excavated sites may be reburied or even abandoned to a fate of inevitable destruction from the onslaught of environmental and biological factors.

This has not been the case with Tutankhamen's tomb in the Valley of the Kings, the site of one of the most spectacular discoveries in the annals of archaeology. With Tutankhamen's tomb, the primary interest has been the magnificent artifacts it contained, and much less attention was paid to the tomb itself—that is, until tourism in

the Kings Valley increased to the extent that threats to the physical integrity of the tomb became apparent. That concern prompted a multiyear collaboration between the Getty Conservation Institute (GCI) and Egyptian authorities, principally focusing on the integrated conservation and management of the tomb and its wall paintings, to ensure a sustainable future.

THE TOMB AND TOURISM

Because ancient Egyptians believed so profoundly in the afterlife, one might imagine that the boy king Tutankhamen (r. 1332–1323 BCE) was luckier in death than during his time on earth, which was probably shorter than twenty years. Not only did his mummy survive the depredations of tomb robbers, the bane of royal graves throughout pharaonic history, so did his grave goods, although archaeological evidence suggests that attempts were made to rob his tomb. Ironically, it appears that flood, the other destroyer of subterranean tombs, saved it from being plundered. Flood debris buried the entrance soon after it was sealed, and the tomb was lost to memory for over three thousand years.



Wall painting conservation work being conducted in the burial chamber of the tomb in spring 2016. Photo: Neville Agnew, GCI.

When the tomb was discovered by archaeologist Howard Carter and his patron Lord Carnarvon in 1922, the media frenzy that followed was unprecedented. Carter and his team took ten years to clear the tomb, so great was the density of objects—golden treasures that Carter himself described as “wonderful things.” Carter must be credited for the pioneering documentation and stabilization of the tomb’s contents. These incredible grave goods, now on display in Cairo, continue to draw dense crowds, and Tutankhamen exhibitions travel the world.

While the objects Carter’s team so assiduously catalogued and stabilized were housed and secured, the tomb itself became a “must-see” attraction for visitors willing to pay an extra fee. Since its discovery, the tomb of Tutankhamen has been open to the public and has been heavily visited. The tomb still houses a handful of original objects, including the mummy of Tutankhamen himself (on display in an oxygen-free case, provided by Glasbau Hahn), the quartzite sarcophagus with its granite lid on the floor beside it, the gilded wooden outermost coffin, and the wall paintings of the burial chamber.

The great demand for entry to the small tomb gave rise to concerns among Egyptian authorities about the condition of the wall paintings. It was thought that the brown spots—microbiological growths on the burial chamber’s painted walls—were growing and threatening to engulf the paintings. “Your last chance to see Tutankhamen’s tomb,” read a news blog from *The Guardian*. “Visitors are causing so much damage to the tomb of Tutankhamen that Egypt’s Supreme Council of Antiquities wants to close it and open a replica instead.”

The apprehension over the impact of visitors on the tomb is well founded, since visitors introduce humidity and carbon dioxide, as well as dust and lint. Humidity promotes microbiological growth and may also physically stress the wall paintings when the amount of water vapor in the air fluctuates, while carbon dioxide creates an uncomfortable atmosphere for visitors themselves. But perhaps even more harmful has been the physical damage to the wall paintings. Close examination of the condition of the surfaces shows an accumulation of damage, including scratches and abrasion in areas close to where visitors have access, and from inadvertent damage

likely caused by film crews with equipment, operating in the tight spaces of the burial chamber. Dust is also a serious problem in the tomb. The visitors constantly pouring through carry dust on their shoes and clothing, which settles on the floor and horizontal surfaces. A more serious consequence is that the dust forms a grey veil on the uneven surfaces of the walls, obscuring the brightness of the paintings and necessitating cleaning, which increases the risk of loss.

The effects of high humidity (a concern for the paintings), excessive carbon dioxide, crowding, and poor presentation have also made for an unpleasant visitor experience as tides of humanity flow in and out of the tomb. Like the golden treasure that the tomb formerly held, ticket sales have been a golden egg—at least prior to the collapse of the tourism industry following the turmoil of recent years. Undoubtedly, visitor numbers will swell again when stability is reestablished, and when they do, the tomb’s inherent fragility will remain a concern.

THE COLLABORATIVE PROJECT

In 2009 Egypt’s Supreme Council of Antiquities (SCA) asked the GCI to collaborate on a project to conserve the tomb and its wall paintings. The GCI had considerable experience working in Egypt on the Tomb of Queen Nefertari project in the Valley of the Queens (1986–92) as well as planning for the conservation and management of the Valley of the Queens Project (beginning in 2006). As with all GCI site projects, intensive study and documentation of the condition were the first order of business. The wall paintings were a focus, given the claims that they were in a parlous condition. The GCI—mandated to investigate the tomb’s actual condition—went on to carry out the most thorough study since Carter’s time. A team of experts included an Egyptologist to conduct background research; environmental engineers to investigate the tomb’s microclimatic conditions; microbiologists to study the brown spots; documentation specialists, architects, and designers to upgrade the tomb’s infrastructure; scientists to study the original materials of the wall paintings; and conservators to carry out condition recording and treatment and to train local conservators.

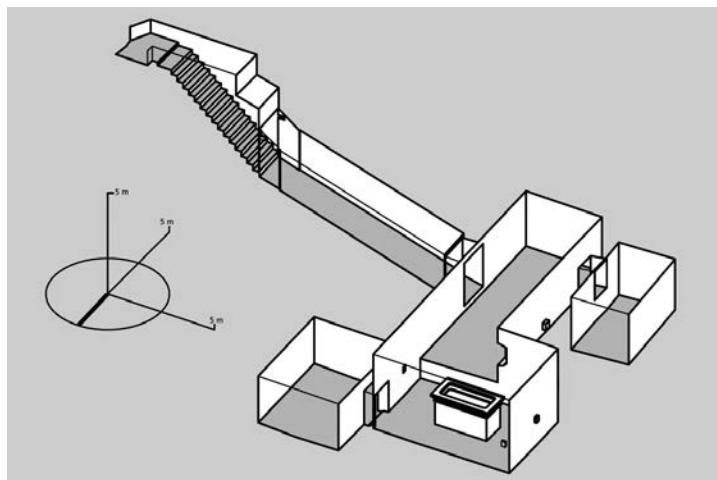
The objectives of this collaborative project were to conserve the paintings; improve environmental conditions; upgrade the infrastructure (lighting, walkways, viewing platform, and ventilation) and presentation (signage and interpretive materials); undertake training of staff; and devise a program for sustainable maintenance and visitation of the tomb. Because the project allowed for unprecedented study of the tomb and its wall paintings, its findings have provided a deeper understanding of tomb construction and decoration practices from the New Kingdom; they have also shed light on the tomb's condition and the causes of its deterioration. These findings have helped the development of measures to counter ongoing risks.

Tutankhamen's tomb is simple in comparison with other royal tombs in the valley. With only four chambers, it is one of the smallest. (In contrast, the tomb of the sons of Ramesses II, KV 5, the largest in the valley, has over 130 chambers and is still being excavated.) Even for a tomb of a historically insignificant king, its diminutive size is unusual, as is its location in the main valley, rather than in the neighboring Western Valley where other Eighteenth Dynasty rulers, including his successor, the pharaoh Ay, are buried.

These circumstances tend to confirm the widely accepted belief that after Tutankhamen's untimely death, the tomb was hastily adapted from one already under construction. This might also explain why only the burial chamber was decorated; the other chambers were left with the bare rock walls exposed. Furthermore, technical inconsistencies in the paintings were observed from wall to wall, including differences in setting-out technique, the omission of a ground layer on one of the walls, and different layer sequencing of how the images were painted on the walls—again suggesting haste in the tomb's preparation.

FINDINGS AND CONSERVATION

The paintings were found to be in relatively stable condition, apart from localized flaking and loss of paint. Flaking was especially prevalent with the black and the red pigments on the east and west walls, but not on the north and south walls. Because of this irregularity, the flaking was likely due to inconsistencies in the materials used and their application. Other losses were attributed to mechanical damage caused by visitors. Newly designed barriers now restrict visitor access in these areas. Further losses can be connected to physical



The layout of the tomb of Tutankhamen. The burial chamber, containing the sarcophagus, is located at the bottom center of the image. © Theban Mapping Project.



Tourists gathering at the entrance to the tomb. Photo: Neville Agnew, GCI.

interventions on the paintings, such as dusting. The installation of a filtered air supply and exhaust ventilation system in 2015 and the implementation of recommendations to limit visitor numbers will help control humidity and carbon dioxide levels, as well as mitigate dust intrusion. These measures will lessen the need for dusting, thus helping reduce risk of damage to the paintings.

Wall painting stabilization was undertaken, including paint flaking stabilization, plaster repairs, dust removal, and reduction of coatings from previous treatments. (Past treatments were not always based on thorough understanding of the paintings' conditions and the causes of their deterioration.) Condition monitoring protocols were also established to better evaluate future changes.

Another major concern has been the mystery of the brown spots that mar the painted surfaces. Other tombs do not show the same phenomenon. Egyptian authorities wondered if the presence of visitors was causing spots to grow, so the project conducted research to identify the microorganisms and determine if they posed a continued risk to the paintings. The brown spots were already present when Carter first entered the tomb, and a comparison of the spots with historic photographs from the mid-1920s showed no new growth. To confirm this finding, DNA and chemical analysis were undertaken and physical samples of the spots were examined under magnification and then mounted in cross section. Analytical investigation confirmed the spots to be microbiological in origin but concluded they were dead and thus no longer a threat. Because the spots have penetrated into the paint layer, they were not removed since this would harm the wall paintings.

The project will be completed in 2018. A bilingual maintenance manual for the installations in the tomb is being provided, together with training for SCA personnel. Recommendations for visitor numbers and management are also being put forward that include guidelines for filming inside the tomb. A symposium is planned for early 2019, during which the project will be presented. A project monograph will appear in due course, and an outreach publication for the general public is planned.

The Conservation and Management of the Tomb of Tutankhamen project carried out interventions to conserve the tomb's wall paintings and put in place measures that can enhance both the preservation of the tomb and the visitor experience. Through its work, the project also expanded our understanding of this significant site from antiquity and employed a methodology that can serve as a model for similar sites.

Neville Agnew is a senior principal project specialist at the GCI. Lori Wong is a GCI project specialist.

ENDANGERED ARCHAEOLOGY IN THE MIDDLE EAST AND NORTH AFRICA

BY ROBERT BEWLEY

THE DEVELOPMENT OF THE ENDANGERED ARCHAEOLOGY IN THE MIDDLE EAST AND NORTH AFRICA PROJECT (EAMENA) was the result of conflicts in the region, particularly from 2013 onward. The media's primary focus was, rightly, on the humanitarian impact of these conflicts. However, reports of looting and the deliberate destruction of cultural heritage, with propaganda produced by the followers of *Daesh*, the so-called Islamic State, elevated this crisis onto the world stage.

In response, the Arcadia Fund¹ agreed to grant-aid a project to rapidly document archaeological sites in the region. Previous survey work by many of EAMENA's cofounders—especially Professors David Kennedy, David Mattingly, Graham Philip, and Andrew Wilson—had demonstrated the increased pace of change in the region. A rapid rise in the region's population was accelerating the demand for land, water, and food; this was having a devastating impact on the landscapes, seriously affecting important archaeological sites. A historical parallel to this was the rapid intensification of agriculture in Britain and continental Europe after 1945, leading to huge losses of archaeological landscapes.

THE EAMENA PROJECT

The EAMENA project² began work in January 2015 with the aim of improving conservation of cultural heritage by providing reliable information for making decisions, employing a standardized online inventory (the EAMENA database) for use by national agencies in the Middle East and North Africa. The EAMENA project covers twenty countries from Mauritania in the west to Iran in the east, each with a variety of recording systems, nationally and regionally. The project has been designed both to assess threats to archaeological sites in the region and to document previously unrecorded sites, in a database developed for use by the national agencies responsible for protection of sites.



There are many obstacles to creating national inventories, including inertia caused by a lack of money and the attitude that “what you don't know doesn't concern you.” This attitude is common among many who lack knowledge of the importance and even the possible economic benefits of cultural heritage, the protection of which remains a low governmental priority in parts of the region. And because archaeology is regionally synonymous with excavation, there is a need to promote awareness of remote sensing, an aspect of archaeology not taught in the majority of the region's universities. Another obstacle is the absence of the principle that the “polluter or developer pays,” whereby, for instance, a company building a road would commission an impact study to determine if any archaeological sites would be affected and then include these expenses in the project cost. Widely followed in Europe and North America, this principle is not yet common in the Middle East and North Africa, although there are signs of change. All these factors increase the importance of archaeologists making the case for the preservation and documentation of not only the honeypot visitor attractions but also the sites that exist beyond the cities, castles, and temples.

Archaeological sites throughout the region face a range of threats, including intensification of agriculture; population growth and the concomitant expansion of villages, towns, and cities; industrial developments such as dam and road building; looting

Ruins of the site of Udhma, north of Amman, Jordan. The site has been bisected by a modern village expansion and swallowed up by gardens and modern houses. Photo: Rebecca Elizabeth Banks. ©APAAME_20141012_REB-0095.

and the illicit trafficking of artifacts; and warfare and the deliberate destruction of heritage for religious or ideological reasons. Given these circumstances—and given that we now have the technology and expertise to undertake the effort—the time is ripe for conducting a rapid documentation of sites across the region.

METHODOLOGY

The vast majority of the sites examined by EAMENA have not been previously recorded and are largely unknown to authorities in the countries concerned. Freely available satellite imagery (from Google Earth and Bing Maps) makes this project feasible. Satellite and aerial imagery is especially important for those countries where field visits are impossible or severely restricted, or where areas are too remote.

The EAMENA documentation process begins with an examination and interpretation of satellite imagery and aerial photographs, and an assessment of previously published archaeological work or surveys. To be useful, these interpretations must be systematically recorded. From the beginning, the EAMENA project adopted the Arches³ data management platform, designed for use in the heritage sphere and developed by the Getty Conservation Institute and the World Monuments Fund. As with any software, customization to meet specific needs is necessary. In addition to being purpose built for creating heritage inventories, what attracted us to Arches was that it was open source and web-based, and that it has the all-important capability of producing reports based on analysis of the database. We developed the right models for archaeological interpretations and threat assessments, and we created our own standard terminologies to ensure valid and consistent data entry by various record creators; this is essential for accurate data input, and it facilitates searching. The EAMENA database and its reference data have been fully translated into Modern Standard Arabic, with local variants also being recorded (and we have been asked to create French and Farsi versions). The EAMENA team has implemented a number of front- and back-end project-specific improvements.

In spring 2017 a fully online and public version of the database was launched. The database, which can be accessed via the EAMENA website, currently contains over two hundred thousand records of archaeological sites. Users can search for well-known sites, such as Petra in Jordan or St. Catherine's Monastery in Egypt, or by site type—for instance, Roman “fortified farms” in Libya. For the security of less well-known sites, detailed information and geographical location are restricted from the general public. Greater access is granted to a number of heritage professionals and academics. An online registration form to allow researchers and heritage specialists to register for full access is being developed.

RESULTS

Although the project has examined imagery for about eight hundred thousand square kilometers across fourteen countries, this is only 6 percent of the region, which covers 13.25 million square kilometers.

Of the more than two hundred thousand sites recorded, initial analysis of a sample of the site interpretations (*site type* in our

database) shows that *burial features* (49 percent) are thus far the most commonly recorded feature, with *enclosures* (20 percent), *settlements* (18 percent), and *buildings* (6.5 percent) the next most common. Still, this is not necessarily representative of the archaeological resources across the region; many more sites and site types will be recorded as the project progresses. Not all archaeological sites are equally visible from satellite imagery; flint and pottery scatters, as well as rock art and inscription sites, will be less well represented when only remote sensing techniques are used. We anticipate that sites relating to burials will outnumber sites interpreted as settlements and those in other categories.

Early analysis of threats suggests that agricultural activity is a main cause of damage to sites across the region, representing 22 percent of all disturbances. While looting represents only about 4 percent of disturbances, it receives major media attention because of the illegal trade in stolen antiquities. Development, infrastructure, transport, and industrial activities account for 11 percent of all disturbances. Thus far we estimate that about 35 percent of all sites have been damaged or are threatened by one or more factors—but again, this number is likely to increase as more records are created and edited.

It is important that decisions related to heritage protection are based on evidence rather than assumptions or the publicity around infrequent but high-profile events. The EAMENA database provides that baseline evidence for the areas it has covered.

TRAINING IN ENDANGERED ARCHAEOLOGY

Under the EAMENA umbrella, there was an important development in 2017 when the British Council's Cultural Protection Fund (CPF) provided a grant to the project for “Training in Endangered Archaeology Methodology with Middle East and North African Heritage Stakeholders.” The project is running a series of training workshops across the region to transfer remote sensing skills and knowledge of imagery analysis and interpretation to heritage professionals, mainly from governmental agencies but also from some universities. The first workshop was held in Tunis, Tunisia,



Tell Farfara in Syria in 2010. Tells are created by a buildup of human occupation over thousands of years. The visible lines around and across this 13-meters-high tell are plough furrows. The plowing has disturbed the archaeological layers close to the surface and exacerbated erosion as the protective layer of topsoil is churned away. Image: Google Earth.



Left: The remains of an Islamic caravanserai and a Roman reservoir in Ma'an, Jordan, in 1998. **Right:** The same site a year later. The caravanserai has been destroyed by the planting of an olive grove. Photos: David Leslie Kennedy.

in November 2017, and the second took place in February 2018 in Amman, Jordan. Further workshops are planned for 2018 and 2019 in Tunisia, Egypt, Jordan, and Lebanon (with shorter workshops funded by others in Oxford, for Iranians; there will also be a training program in Saudi Arabia).

The CPF-funded workshops are spread over two weeks for ten trainees drawn from heritage professionals in Egypt, Iraq, Jordan, Lebanon, Libya, Palestine, Tunisia, and Syria. To earn their certificate, each trainee must create one hundred records in the database. They are provided a laptop they can use in their work after the course has been completed. To assist with future monitoring and recording, each trainee is also given a camera and a GPS. Although these workshops are in their early days, trainees have said that they are acquiring exactly the skills they need. Having locally based heritage professionals who are skilled in remote sensing techniques and who have access to the standardized database is a sustainable path forward. UK-based teams can do much of the preparatory work and create the baseline data, but to make a real difference records should be managed locally and used by those who know where major threats lie. Then, it is hoped, they will mitigate the threats as best they can.

As archaeologists, it can be easy to forget that not everyone shares our passion for the past or considers cultural heritage to be as important as we do. However, the major challenge—worldwide, and not just in the Middle East and North Africa—is convincing people (especially decision makers in the region) that heritage is not a drain on resources but rather can be a source of income. In Britain, where major changes in the landscape include house building and industrial development, cultural heritage by law must be taken into account as part of the decision-making process. Experience has shown that throughout the Middle East and North Africa, with a few notable exceptions, the vast majority of building occurs without any recognition of cultural heritage that may be damaged or destroyed. The common excuse is that there is no record or information, but by having national inventories this excuse will no longer be viable. The EAMENA project aims to provide the basic information for these inventories and create the opportunity for every country in the region to have its own national heritage inventory. With UNESCO support, we are working with Yemen's General Office of Antiquities and Museums (GOAM) to create a national heritage platform, based on our database; the conflict

there has made this a high priority. The next step is to broadcast the availability of that information and ensure that others act on it. The EAMENA project has worked with many agencies that have responsibility for protection of heritage, including GOAM, Yemen; the Department of Antiquities, Jordan; INRAP (Institut national de recherches archéologiques préventives), Morocco; UNESCO; and the International Committee of the Blue Shield, as well as the UK and US national Blue Shield committees.

A CRITICAL MOMENT

The EAMENA project is ambitious, covering twenty countries and tackling an enormous task: to record in a short period as many archaeological sites currently under threat as possible. The project has funding until the end of December 2019, but we hope its legacy will continue through the trainees and their employees (mainly in governmental departments of antiquities and universities), and that further funding will be made available.

The project is at a critical moment. This year will see the delivery of five CPF training courses, with extra ones planned for Iranians as well as one in Saudi Arabia. In addition, the discussions, developments, and possible delivery of bespoke “national, digital, heritage inventories” to the relevant national agencies is a priority. This is all in addition to the main task of documenting the most significant archaeological sites under threat. The training courses advance the documentation, as each trainee has to create records for the project. By the conclusion of the project, over 140 heritage professionals will have been trained in the EAMENA methodology. All will have full access to their country's database so they can continue to monitor and record threats to sites. Thus there is a foundation for a sustainable future for cultural heritage in those places where the infrastructure of information and skills has been created. While further funding will be needed, it is the hope of the EAMENA team, the institutions involved, and the funders to maintain and develop the EAMENA database and methodology into the foreseeable future.

Robert Bewley is director of the EAMENA project.

1. <https://www.arcadiafund.org.uk>
2. <http://eamena.arch.ox.ac.uk>
3. <https://www.archesproject.org>

NECESSARY INTEGRATION

A Discussion about Archaeology and Conservation Education

CHRIS CAPLE is an associate professor in conservation in the Department of Archaeology at Durham University in the United Kingdom.

IOANNA KAKOULLI is a professor in the Materials Science and Engineering Department of the University of California, Los Angeles, and was formerly the Lore and Gerald Cunard chair of UCLA's Interdepartmental Program in the Conservation of Archaeological and Ethnographic Materials.

CLEMENTE MARCONI is a professor of the history of Greek art and archaeology at the Institute of Fine Arts of New York University.

They spoke with **TOM ROBY**, a senior project specialist with the GCI department of Buildings and Sites, and **JEFFREY LEVIN**, editor of *Conservation Perspectives*, *The GCI Newsletter*.

TOM ROBY Each of you teaches in a university with degree programs in both conservation and archaeology, of which there are very few in the world. What were the reasons behind the development of these programs?

IOANNA KAKOULLI The establishment of the conservation program at UCLA was based more on an intrinsic need to train conservators for the preservation of archaeological and ethnological materials around the world than on the recognition of the contribution of conservation to archaeology and related fields. Conservation in general—despite all the advancements it has made—is still not considered at the same academic level as archaeology. Many archaeologists don't always see the need for conservation to be carried out by trained conservators. I've participated in many meetings where archaeologists have presented their approach to site management after excavations, and it was something they did by themselves without consulting with conservators—let alone having conservators as an integral part of their team.

CHRIS CAPLE At Durham they started teaching archaeology in the 1950s. Problems with dirty, unstable, and fragmentary excavated artifacts prompted the head of the department to look for conservators in the 1970s, and a number of courses started in the

UK around the same time—not only at Durham but also at Cardiff, joining the existing course at the Institute of Archaeology. It really was about solving the problems that archaeological artifacts were generating as they came out of the field. How could we look after this material? It kind of developed from there. After we started doing the work, we began to train students, and very quickly the university wanted us to award degrees. So it was archaeologists at both Cardiff and Durham who saw the need, and the course came out of a field archaeology requirement.

Ioanna, you're right that in academic terms conservation is still struggling to be taken as seriously as archaeology. Our archaeology colleagues sometimes do see us as a bit of a handmaiden to their endeavors, which is frustrating. Hopefully, as we work on them year upon year, they can be a little more generous in their recognition of our efforts and what we can bring to the party.

CLEMENTE MARCONI At the time the conservation program was established at the Institute of Fine Arts in 1960, the mission of the institution was to provide graduate education in art history, archaeology, and museum work. The two essential factors in the development of the conservation program were art history and museum training, at a time when art history at the Institute was particularly focused on objects. So our conservation program did not come out of archaeology in any particular way. However, the establishment of conservation education as an essential component of our academic mission has fostered a culture of mutual respect and collaboration between fields, including the recognition of the essential role of conservation in archaeological practice—from site management to the conservation of finds—on the part of both our faculty and our students.

JEFFREY LEVIN What do each of you think needs to happen in higher education to improve collaboration between archaeology and conservation—in terms not only of objects but also sites themselves?

KAKOULLI There are already ongoing collaborations—mainly in the field, where conservation and archaeology meet and collaborate. Every summer, for example, we send our students to archaeological excavations led by UCLA archaeologists, as well as to other



Let's not forget the power of artifacts to communicate. If I were going to say how we highlight the importance of conservation to archaeologists, let's do it through the artifacts.

CHRIS CAPLE

"foreign" excavations, so on the object side there is that support, which is linked directly to the students' education. There is less on the site management side. In my experience, we haven't really participated in a major way in site preservation. Moving forward, a lot depends also on the institutions themselves. At UCLA, our program is under social sciences—in other places, conservation programs could be under humanities or the fine arts or architecture departments or divisions—and it has been difficult to get the support we needed to enhance these collaborations. In some ways we don't speak the same language. In social sciences at UCLA, we have departments such as history, economics, and sociology. And then we have conservation. Our interdisciplinary and multidisciplinary training is bridging the two cultures described by C. P. Snow—the physical sciences and the humanities. Our program is not fully aligned within social science, and that is a challenge in increasing collaboration and integration and receiving support.

CAPLE It's a difficult question. History suggests that one of the key reasons people look at heritage and think about its preservation is individual instances of loss. If you look back, you can see that when high-profile sites come under threat, it stimulates interest in higher education and legislation, and in heritage agencies actually doing something. It seems perverse to suggest this, but it is loss that actually focuses people's concerns on conservation. We have to recognize that threat has a role here. Obviously, we don't want to imperil something, and we make responsible arguments to archaeologists, our administrators, and others, but in most cases it's when they need our help that they raise concerns and listen. It's not just a question of us speaking—it's a question of them listening. Perhaps we need to take those opportunities when

they arise—where individual finds come up and events occur, and then we step forward. Whether it's finds or particular problems on an excavation, these are real opportunities for us. Maybe we need to be more aware of utilizing them to make people recognize what we can offer.

MARCONI Your question is about higher education, but before I address that, it is very important to take legislation into consideration. The collaboration between archaeologists and conservators should be mandated. In Italy, it was only about twenty years ago that it was mandated by law that for state-sponsored projects and major works of infrastructure there had to be a preliminary investigation of the site by archaeologists. This law did not come from the politicians but from the archaeologists, who made a very strong case for the presence at, and the contribution of, archaeologists to site investigations.

Now, focusing on higher education, we should be very outspoken about the need for this collaboration. I can think of two possibilities. One, obviously, is developing interdisciplinary education and training in archaeology and conservation. For example, at the Institute we will be starting a new course on methodologies of archaeology and conservation that will be mandatory for students who are working in the field and are going to archaeological projects. Michele Marincola and I will co-teach this foundational class. This is definitely one way—a course co-taught, with the students coming from both conservation and archaeology. There is also the need to talk about conservation in our courses on ancient art and archaeology. For example, when you talk about the Acropolis, you should discuss site management and evolving ideas about conservation. And the same when you talk about objects

found in an excavation. In this way, even students who may not go to excavations but want to know about ancient art can learn about the essential role of conservation.

ROBY That's great news about the joint course you've organized, Clemente. In that course, is there going to be some emphasis on both objects and sites? Traditionally there's been a division between the two, and I wonder how you feel about trying to integrate within conservation training both object conservation and site conservation.

MARCONI For me, there should be no separation between objects and sites. You really cannot deal with the object without considering the site where it was found and used in ancient times. More generally, the study of ancient art cannot be divorced from its contexts. We have had enough scholarship on ancient art that has systematically avoided context, and we all know the disastrous consequences of that approach. This connection between sites and objects is essential. The way Michele and I have structured the course is to make use of our site excavations as a general framework. The class will first address the sites as a whole, and then we discuss the objects from these sites in their original architectural, ritual, and social contexts. So there is integration between the two in the structure of the course.

KAKOULLI I totally agree you can't separate the two, but it does come down to the practicality of teaching. I used to teach a seminar called "Issues in the Preservation and Management of Sites" that was mandatory for conservation students and open to archaeologists and students across campus. It was a nice integrated seminar on understanding how materials bring out the culture and how this can also be taken into consideration in terms of site management. With changes in the curriculum, I don't teach this course anymore. We had another course on methods of field conservation that we designed particularly for archaeology students, but because it wasn't mandatory for them, we ended up teaching it to our conservation students—and they thought, "Okay, yet again you're giving us another course that's a bit redundant given all the other courses we've done." In addition, having both these themes in one course can't work in the quarter system, because in ten weeks we can hardly do anything. If we want to make this instruction effective with both parties benefiting, it needs sufficient time and has to be mandatory for both.

CAPLE I agree that if you make some of this optional, you end up with a self-selecting group. It's important to convince the archaeologists that they need to understand something about the decay processes of their materials and the reasons that things survive, followed by aspects of conservation. We also have to be realistic about doing a certain amount of basic education for as many archaeologists as we can reach. From there, we have to have options for going into greater depth. Eventually you do require some specialist knowledge. It's a step-by-step process, starting with a broad base

that encompasses a wide range of students who are working in the heritage or archaeology fields. As we step up in terms of complexity, knowledge, and skill, there are going to be smaller and smaller numbers. The problem we face in the UK at the moment is funding. You have to have enough students to make things financially viable. We see declining numbers of archaeology undergraduates, and we're having courses close and merge. When we talk with other departments of archaeology about conservation, they say, "It's our survival that's important. We can't afford to put conservation into the existing curriculum for all our archaeology undergraduates. We recognize that there's some interest from students, but we lack the resources to do it." So I think we have to continue our efforts to encourage our archaeology colleagues. The professional archaeology organization, CIfA, is starting to accredit university courses, and as part of accreditation they have a strand that includes conservation. We'll be involved in working with them to see how much we can ensure through the accreditation process that all archaeology students understand something of conservation. But there can be only so many universities and so many courses. We have to be thinking in terms of what can be presented to a large number of people. After all, unless the archaeologists are actually asking for it and believe it is important, we won't get the involvement we want.

LEVIN Part of this is a question of resources, but you're also suggesting that it's a question of attitude—attitude in the archaeology field that conservation needs to be part of archaeology instruction and incorporated into field practice.

CAPLE It is, but that goes back to my earlier point. When people see loss and damage, that's when they think, "We have to do something about this." Which comes back to questions regarding archaeological ethics and responsibilities, and getting archaeological colleagues to take that on. That's where a professional organization like CIfA is perhaps one way forward.

ROBY You mentioned archaeological ethics. I know that's something that professional organizations have been encouraging. Are you aware of development of courses in that subject in the UK?

CAPLE It's an element in most courses, and it's certainly raised where professional accreditation is taking place. But it's a question of competing in a busy marketplace, with things like human skeletal material, repatriation of artifacts, working with local communities, preventing violation of sites, and legal requirements. It's a busy old schedule that archaeologists have to work with, and resources come back into this. Some UK museums are starting to refuse to take finds because they're running out of space and their funding is being cut. There is less local enthusiasm for getting artifacts because museums are closing or not able to cope with them. If there is no pull for the artifacts at the other end, what good is it to just keep churning them out? It's quite complex. You have to look at the whole system and how to create enthusiasm in the local population for visiting their museums and seeing their past come to light.

KAKOULLI On the ethics side, while it might be integrated into archaeological practice, I don't think it's something that's taught. We do have a class on ethics and principles of conservation that is open to archaeologists, but they're not required to take it. From the archaeological side, the curriculum at UCLA in certain respects hasn't changed for a long time, although archaeology students do go through a course that covers some of the ethics and schools of thought that guide the field. As I've said, there'd be a tremendous benefit from integrating into the archaeology curriculum an appreciation and understanding of conservation principles and ethics. There are some concepts that could overlap, but they're taught slightly differently.

MARCONI In 2010 the Institute was awarded a grant from the Andrew W. Mellon Foundation to support a four-year study that would seek to explore and shape the direction of research and teaching in the fields of art history, archaeology, and conservation. I was part of the panel charged with examining archaeology, and to this end we interviewed a large number of colleagues in the field, mainly working in the Tri-state area. I don't remember much discussion about ethics in terms of formal teaching—it was all about ethics in the practice of archaeology. On the other hand, ethics is an important component of my classes at various levels, and I suppose it's part of the teaching of our colleagues in the archaeology and anthropology departments. But as far as I know, there is no formal requirement for teaching archaeological ethics.

LEVIN All of you have outlined some of the challenges with respect to a greater integration of education in archaeology and conservation. But I'd be interested in hearing each of you describe some practical steps that could be taken to promote that integration.

CAPLE In the UK we often have small-scale excavations, and there is much less need of conservators on those excavations. We're not getting whole vessels—we're getting fragments and shards, and so there are fewer conservation problems on-site. When you have large American universities going to dig in the Mediterranean or in Turkey, you have long seasons, and often a conservator is embedded with the excavation. That provides a very positive experience for a number of our students who go off on such excavations. What I would like to see are events taking place on an excavation site that make archaeologists very aware of what the conservator can do.

I sometimes think we can be too theoretical. It's very clear that whenever discoveries do happen—when you get to the bottom of a waterlogged ditch and you produce some leather shoe or something like that—that's when the archaeologist gets excited, and that's when the local people get excited. I'm not only a conservator but also an archaeologist, and on my own excavations of a medieval castle in Pembrokeshire a couple of years ago we actually did find a shoe that I conserved and brought back the following season. It was much more exciting to the local people than almost anything else. The ability to see this was almost magical

to some people. Let's not forget the power of artifacts to communicate. If I were going to say how we highlight the importance of conservation to archaeologists, let's do it through the artifacts. Courses—yes, they're important, but sometimes it's just getting students and archaeological professionals to actually see some of these artifacts and what we can do for them. It's making them think, "We can do more, we can do better." Yes, we should be talking to professional organizations. Yes, we need to look at degree courses and try to influence those organizations and those courses that don't have conservation in them. But above all, let's recognize the magic of artifacts and use that as our way in. Because that's the thing that fascinates people.

KAKOULLI I think professional organizations can play a vital role and be great advocates. They can develop guidelines and, in some ways, enforce this collaboration. From the practical side of academia, unless you develop a mandatory course for both sides, it will never be successful. It's not difficult for it to happen—it's just a matter of both sides adding it to their curriculum. Another thing is mutual respect and understanding between the two fields. We need to find that common language that can help us communicate how we can really help each other out. As Chris said, the objects are our medium, and they could be the lingua franca that we speak. They can also be used as a means for community outreach—a way to speak the cultural heritage language. So that could really contribute both to the integration of the fields and to community awareness and respect for culture in general. Even from an academic perspective, I think it could help us push our agenda forward and be mutually beneficial.

MARCONI I'm for legislation that emphasizes having conservators as members of archaeological missions. We need to be speaking to governments in charge of cultural heritage and making a strong case for an integration of archaeology and conservation. For example, we have an archaeological project in Sicily where there are requirements for obtaining and maintaining a permit. If you want to carry out an excavation, you need to have a professional archaeologist to excavate according to the most rigorous standards, you need to undertake proper documentation, and you need to publish within a certain amount of time. How about introducing the presence of conservators in the excavation among these requirements? Professional organizations can advocate for this with the institutions in charge of administration of the cultural heritage. So this is one aspect. The other is the magic of the artifact, as Chris mentioned. It is astonishing that there is no particular sensibility among archaeologists as to how much you can gain in terms of knowledge, not only by stratigraphic digging but also by involving a conservator in the excavation process. I will mention an example. We are working on the acropolis of Selinunte in Sicily, excavating one of the earliest monumental temples in the West, dating to the early sixth century BCE. The building was completely sealed in its archaic and classical levels, and under the original floor we have been finding dozens of objects along



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IOANNA KAKOULLI

the inner walls of the cella, belonging to the foundation deposit. We found pottery, metalwork, and even a musical instrument made of bone. No archaeologist is allowed to retrieve these objects as they come out of the ground. This is the first thing you learn by collaborating with conservators—they really are the most appropriate people to handle objects during an excavation. There is so much information that you get through collaboration with conservators. For example, in our foundation deposit we found one of the largest documented collections of iron weapons from archaic and classical Sicily. And this is not because of the particular nature of the deposit but really because of the presence and active role of conservators in stabilizing the objects in the ground, retrieving them, and treating them in situ and in the lab. I may add that our most important finds are now on display in the local museum, which opened in September, based in large part on our discoveries. Precisely because of the presence of conservators in our team, the objects we found in July were on display in September. I would like to speak not only of the magic of artifacts for the general public, but also of the magic of conservation for archaeologists.

LEVIN Looking back with respect to these issues, how have things changed over the last twenty years—for good and for bad? For example, in terms of the conservation of archaeological and ethnographic objects, the whole UCLA program didn't exist twenty years ago. Are there other things that each of you would note?

CAPLE In Britain, we've had courses in archaeological conservation since the 1970s, so in those terms the situation isn't very different. What we've seen recently is a more commercial side to archaeology and more financial constraints. And we probably

had a little more optimism twenty years ago. We've become more realistic about what the development industry will support, and we've had courses close or move. We're educating roughly the same number of students in archaeology and in conservation—that's been fairly static. We've seen more management and more excavation taking place in the UK, with finds being stored until the excavation has been completed. At that point, there's an assessment of those finds, and we decide how much will be conserved. Not everything is. Only those from the best context and the most meaningful. There's a real awareness of the value of money, and decisions are made after the excavation is finished and before conservators get involved. Conservation is seen as expensive, and so we're getting strategies to minimize the cost and maximize the input, selecting artifacts on the basis of X-rays—sometimes even before they've been fully cleaned—and on the basis of what will be needed for the museum. We don't have enough money to conserve them all. There are the high priorities and medium priorities, and the low priorities might get attention only if you've got a little time on a Friday afternoon. Almost all the conservation work that goes on in museums now is for exhibition and for loans. We do not see work going on in stored collections. And so we've been making much more strategic use of conservators. We now have to think about ways we can deliver more information to the archaeologists without raising costs. For the most high-profile objects, yes, of course, there's a public interest and demand, and they are beautifully cleaned. But those middle-range artifacts that used to be better cleaned, better researched, and better investigated have dropped in the pecking order a bit. Money is just a little too dominant in our world at present, and it's impacting conservation to its detriment.



I'm for legislation that emphasizes having conservators as members of archaeological missions. We need to be speaking to governments in charge of cultural heritage and making a strong case for an integration of archaeology and conservation.

CLEMENTE MARCONI

MARCONI In the last twenty years, there definitely has been progress in terms of awareness of the importance of conservation for art history. Now we have a branch of art history, technical art history, which represents an important intellectual development, making us more sensitive about materiality than before. This is naturally an important development. On the other hand, when you move from objects to site management, the picture is uneven. It all depends on money. Money is dominant, governments are dominant. I can speak of Italy, where government philosophy has shifted to focus on sites that are major tourist attractions. I don't need to tell you how problematic this is for a country like Italy, where cultural heritage is spread all over the peninsula in both cities and countryside. It's all very good for those major sites such as Pompeii and Agrigento, where there's been a significant increase in government funding. However, lesser sites are suffering, and museums at these sites suffer, together with the conservation of their objects. In Selinunte we had the opportunity to contribute to the opening of a local museum, with funding provided by the European Union, mainly because we are talking about a major archaeological site. So some places are doing much better than others, and money is definitely dominant in the current landscape.

KAKOULLI I'll take a different perspective on the last twenty years. It was during this time that we started seeing conservation changing as a discipline and becoming more of an academic field. Previously it was more of a craft, if you will. We can see that even from the two primary schools teaching conservation in Italy—the Opificio delle Pietre Dure in Florence and the Istituto Centrale per il Restauro in Rome, renamed Istituto

Superiore per la Conservazione ed il Restauro. These are schools that taught a diploma in conservation, which was changed to a university degree equivalent to a master's degree. At the same time, we've seen the development of many other courses worldwide, both in conservation and in conservation science at the master's level. These are seen primarily as professional courses rather than research degree courses, or they are perceived as such. Nevertheless, you're getting out of school with a master's and a professional degree, and I think that brings new appreciation of the profession and enriches it in various ways. The other thing that I see is a greater appreciation of the materiality of the object and a recognition of conservators' understanding of the material. I work a lot with the FBI and Homeland Security for the repatriation of artifacts, and they seek help from us because of our understanding of the materials. Sometimes just the stylistic analysis from an archaeologist alone is not enough to close a case or to understand where these objects came from. You need to go one step further, and this is where conservators and conservation scientists have more credibility. There is more and more taught in courses about these issues of international cultural heritage and its preservation, and I hope that this can help advance the integration of archaeology with conservation, perhaps in a more organic way.

RESOURCES ARCHAEOLOGICAL CONSERVATION

BOOKS, JOURNALS, AND CONFERENCE PROCEEDINGS

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Assessing the Values of Cultural Heritage, edited by Marta de la Torre (2002), Los Angeles: Getty Conservation Institute.

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Conservation and Management of Archaeological Sites 5, nos. 1–2 (special issue on protective shelters), edited by Nicholas Stanley-Price and Frank G. Matero (2001), London: James and James (Science Publishers) Ltd.

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Conserving Cultural Landscapes: Challenges and New Directions, edited by Ken Taylor, Archer St. Clair, and Nora J. Mitchell (2015), New York: Routledge.

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Technician Monaem Ounifi cleans a mosaic in the *Maison de la Chasse* at the site of Bulla Regia in Tunisia. Photo: Scott S. Warren, for the GCI.

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Of the Past, for the Future: Integrating Archaeology and Conservation: Proceedings of the Conservation Theme of the 5th World Archaeological Congress Washington, D.C., June 2003, edited by Neville Agnew and Janet Bridgland (2006), Los Angeles: Getty Conservation Institute.

For more information on issues related to archaeological conservation, search AATA Online at aata.getty.edu/home/

GETTY CONSERVATION INSTITUTE RECEIVES \$5 MILLION GIFT FOR CONSERVATION EFFORTS

Through the generosity of John and Louise Bryson, a new endowed fund supporting the work of the Getty Conservation Institute has been established. The John E. and Louise Bryson Fund for the Getty Conservation Institute will support all aspects of the institute's work. In recognition of the Brysons' generosity, the institute's directorship position has been renamed the John E. and Louise Bryson Director. This is the Getty's first named directorship.

Tim Whalen, John E. and Louise Bryson Director, said of the Brysons' gift, "John and Louise's remarkable gift will extend the reach of this

Institute in ways we had not imagined. Their commitment to our work is stalwart! I am honored that the GCI is connected to the consequential activities and interests they have shaped, led, and supported over the decades. They understand the importance of what we do and its connection to advancing civil society. I am grateful to them both for their vision and for their generosity."

The Brysons are longtime supporters of the Getty. Louise Bryson served on the Board of Trustees for the J. Paul Getty Trust for twelve years, including four as Chair of the Board. She was made Chair Emerita in 2010. The Brysons are active members of the Getty Conservation Institute Council, of which Louise is chair and founding cochair.

"Investing in the GCI is the best leveraged philanthropy that John and I can imagine," said Louise Bryson. "I'm completely convinced of the impact of the GCI and its projects. I know our gift will help advance conservation and create a lot of goodwill with other countries. For John and me, the Getty really is a place that makes a difference. We know our gift will help preserve things that are important to us all. Art and cultural heritage bring people together. That's what the Getty does."

John and Louise Bryson have had distinguished careers in business and non-profit leadership. John was Secretary of Commerce under President Obama, CEO of Edison International, and cofounder of the Natural Resources Defense Council. Louise was a senior executive at Lifetime and chair of KCET, and she serves on the boards of the American Academy of Arts and Sciences and the California Community Foundation.



John and Louise Bryson. Photo: Ryan Miller/Capture Imaging

GCI News

Project Updates

ACOUSTIC EMISSION EXPERTS MEETING

In November 2017 the Getty Conservation Institute (GCI) convened a meeting at the Getty Center to discuss recent advances in applying acoustic emission as a direct technique for monitoring physical change in cultural heritage objects. Invited scientists and conservators active in acoustic emission studies considered areas where research is needed and ways data can be shared, as well as ways the conservation community and allied professions (such as curatorship, administration, and facilities) can be apprised and included. They also discussed how acoustic emission technology can inform the exploration of sustainable environmental strategies for the preservation of collections.

Acoustic emission (AE) is defined as the energy released as ultrasound and sound waves during microdisplacements in a structure undergoing deformation. As physical failure of materials is often preceded by a discernible level of AE activity, the monitoring of AE has become an important nondestructive tool in material science and engineering for predicting macrodamage and tracing crack propagation.

When applied to the field of cultural heritage, AE monitoring facilitates tracing physical damage in a historical material or object when a stress field develops because of a deterioration mechanism. Although its use in conservation studies is relatively recent, examples of heritage-focused AE research include studying the decay of porous stone in Spanish architectural heritage due to salt crystallization, monitoring AE from the larval stage of wood-boring insects to detect object infestation, and tracing environmental stress in wooden museum objects.

The Getty Center meeting began with a review of the technical aspects of AE monitoring, including: the importance of calibration in establishing a relationship between AE and the level of damage; the attenuating effect of distance on the AE signal and its effect on the physical range of AE monitoring; the choice of AE sensor placement, which often focuses on



At the November 2017 GCI-organized meeting, experts in acoustic emission and end users discuss implementation of the technique. Photo: Emma Ziraldo, GCI.

a location that is perceived to be vulnerable (e.g., crack tip); and the sensitivity of AE to brittle cracking but not to deformation, which can also be considered damage.

Subsequent discussion focused on field implementations of AE monitoring to target object response when subjected to a new temperature and relative humidity regime, to correlate specific climatic conditions with a survey of well-documented objects that have been damaged, and to explore the evolving vulnerability of an object when exposed to reoccurring environmental stresses.

At the close of the meeting, participants agreed to create a user group platform to facilitate sharing of AE data and provide technical support, and to develop AE guidelines for the cultural heritage field describing monitoring protocols, system calibration, and methods of data interpretation. The use of AE monitoring can assist those responsible for managing

collecting to better understand conditions that may contribute to object damage.

This meeting was held as part of the GCI's Managing Collection Environments Initiative, a multiyear initiative that addresses a number of compelling research questions and practical issues pertaining to the sustainable management of collection environments in museums.

External Participants

Chiara Bertolin, *Norwegian University of Science and Technology*

Nigel Blades, *National Trust for England, Wales, and Northern Ireland*

Lukasz Bratasz, *Institute for the Preservation of Cultural Heritage, Yale University*

Eric Hagan, *Canadian Conservation Institute*

Roman Kozlowski, *Jerzy Haber Institute*

Marcin Strojcecki, *Jerzy Haber Institute*

David Thickett, *English Heritage*

Getty Participants

Managing Collection Environments Initiative Team Members

Vincent Beltran, *Assistant Scientist*

Foekje Boersma, *Senior Project Specialist*

Jim Druzik, *Senior Scientist (Retired)*

Ashley Freeman, *Research Lab Associate*

Michal Lukomski, *Scientist*

Joel Taylor, *Project Specialist*

Emma Ziraldo, *Graduate Intern*

Beril Bicer-Simsir, *Associate Scientist, Getty Conservation Institute*

Julie Desarnaud, *Assistant Scientist, Getty Conservation Institute*

Arlen Heginbotham, *Conservator, J. Paul Getty Museum*

DISNEY ANIMATION CELS WORKSHOP

As part of the Getty Conservation Institute (GCI) and the Disney Animation Research Library (ARL) project to investigate conservation approaches for Disney animation cels, a hands-on workshop was held in December 2017 for five participants from Southern California institutions with Disney animation cels in their collections. The purpose was to educate an initial group of participants on innovative treatments for relaying animation cel paints exhibiting delamination, flaking, or both.

Damage to cel paints can occur within storage boxes by contact with interleaving materials or other cels and by gradual changes in the composition of the plastic sheets through processes that can be mitigated by controlling the storage environment.



As part of the experts meeting, GCI senior scientist Michal Lukomski explains the use of acoustic emission in a GCI pilot study. Photo: Emma Ziraldo, GCI.

Research from the GCI-ARL project has revealed three distinct paint formulations in cels created between 1937 and 1985 by the Walt Disney Animation Studios. Participants practiced paint relaying techniques that take into consideration the unique chemical composition and working properties of Disney cel paints. Specific treatments for cels from each time period were demonstrated.

Participants also learned practical ways of differentiating three common types of plastic sheets, techniques for removing interleaving papers and paints from cels inadvertently adhered to the paints, and methods to relay paints dislocated during storage. Instructors also demonstrated documentation techniques developed for a condition survey of ARL-owned cels. The workshop was held at the ARL in a specially constructed, environmentally controlled chamber that included a workbench equipped with lighting, cameras, and mirrors for viewing both sides of the cels during treatment.

Participants will continue to practice these techniques during the remainder of the GCI-ARL research project and contribute their findings to the study.

The Disney Animation Research Library is the world's largest archive of animation art, housing approximately sixty-five million pieces of animation art created over more than eighty years by the Walt Disney Animation Studios. The research on Disney animation cels is part of the GCI's Preservation of Plastics project, which studies a wide range of plastics to understand how to prevent or slow degradation, estimate risks, establish suitable approaches to preservation, and design appropriate conservation treatments.



Participants in the Three Museums by Le Corbusier workshop gather outside the Chandigarh Museum. Photo: Alexandre Gonin.

Recent Events

THREE MUSEUMS BY LE CORBUSIER: A WORKSHOP FOR THEIR CARE AND CONSERVATION

In February 2018 staff from the Getty Conservation Institute (GCI) and representatives from three Le Corbusier-designed museums—the Government Museum and Art Gallery in Chandigarh, India, the National Museum of Western Art in Tokyo, and the Sanskar Kendra museum in Ahmedabad, India—met in Ahmedabad for a five-day workshop.

The purpose of the GCI-organized workshop—part of the GCI's Conserving Modern Architecture Initiative—was to advance conservation practice and create a professional network among the museum participants. Also in attendance was the director of the Fondation Le Corbusier in Paris, which maintains the architect's archive and acts as a resource for scholarship on Le Corbusier.

At the workshop, participants shared information about their museum buildings, discussed the significance of their buildings both individually and collectively, toured the two museums in India, and developed policies for conservation. Each museum also developed an individual statement of significance, after which a statement of collective significance was drafted—especially useful to the museums in India, which are in the early stages of their conservation strategies.

Le Corbusier was one of the first twentieth-century architects to have a global practice, and the three museums (the only ones he built) were designed in the 1950s and 1960s based on his concept of the "Museum of Unlimited Growth." Although designed for different urban contexts and climates—and although they house different kinds of collections—they share many similarities in design and layout.

The National Museum of Western Art in Tokyo sent a delegation headed by its deputy director and chief curator. The museum's building (completed in 1959) is in good condition but has several additions designed by different architects; it houses one of the most significant



A conservator relaying paint from an animation cel during the workshop at the Disney Animation Research Library in December 2017. Photo: © Disney.

collections of Western art in Asia. In 2016 the building was designated a World Heritage Site as part of the Le Corbusier transnational serial listing. Museum staff are conscious of the dual role of their institution: as a place for the display of art and as an iconic building.

The Sanskar Kendra's building (completed in 1954) in Ahmedabad is in poor physical condition, and in recent years the museum has experienced decreasing visitation. Its collection includes examples of traditional Gujarati paper and fabric kites, and it serves as the city museum of Ahmedabad. The museum's delegation included representatives from the Ahmedabad Municipal Corporation's Heritage office, along with notable local architects with experience in heritage conservation. The city government recently committed funds to renovate the Sanskar Kendra, and the workshop coincided with the start of planning for improvements to the building and its collection.

The Government Museum and Art Gallery in Chandigarh (completed in 1968) was the last museum in this group to be built. It houses an important collection of Gandhara sculpture and a notable collection of Indian miniature paintings, in addition to contemporary art and textiles. The city of Chandigarh was designed in its entirety by Le Corbusier, beginning in the early 1950s, with the art museum located prominently in its cultural core. It is designated locally and acknowledged nationally as a modern architectural icon. The Government Museum delegation consisted of museum staff and consultants working on its conservation management plan (CMP). The CMP, which will guide the conservation of the museum building and collections, was funded through the Getty Foundation's Keeping It Modern initiative.

An important outcome of this workshop, in addition to the sharing of information about common issues and heritage, is the network of museum professionals created. Participants left with an expanded understanding of their own museum's heritage significance and an appreciation for their "sibling" museums. The group has committed to continue to share information about common issues and concerns, and it will look for opportunities to meet again.

The GCI's Conserving Modern Architecture Initiative was created to advance the practice of conserving twentieth-century heritage through research and investigation, the development of practical conservation solutions, and the creation and distribution of information through training programs and publications.

SURFACE TREATMENT STRATEGIES FOR OUTDOOR PAINTED SCULPTURE

The inaugural Surface Treatment Strategies for Outdoor Painted Sculpture workshop was held at the Getty Center February 19–23, 2018. Over five days, eighteen participants from Europe, Asia, and North America attended hands-on practical sessions, lectures, and discussions; they also made site visits to sculpture parks and to an industrial paint applicator.

Since outdoor painted sculptures are exposed to harsh environments, their paint coatings are prone to rapid and extreme deterioration. The scale and outdoor location of

these objects frequently necessitate the use of industrial methods and materials to treat them—yet as works of art, the conservation of these sculptures must be approached with thoughtfulness, caution, and sensitivity to aesthetics.

Conservators, even those specializing in sculpture, modern and contemporary art, or both, often lack knowledge of the paint industry and therefore have to learn on the job about the durability of paint systems, their application properties, and the surface preparation required. This deficiency can sometimes lead to costly mistakes. The workshop aimed to address this knowledge gap and to provide conservators with a palette of conceptual and



Outdoor Painted Sculpture workshop participants on a field trip to look at sculptures in the collection of the City of Beverly Hills. Photo: Evan Guston, for the GCI © J. Paul Getty Trust. Artwork: *Sisyphus* by Alexander Liberman, © Liberman Art Partners, 2018.

practical tools to assess and respond to a variety of situations.

Among the topics covered during the workshop were: the basics of surface preparation and coatings technology; the pros, cons, and logistics of working on-site versus working at an industrial paint applicator; different methods of mitigating coatings defects; and local treatment to prolong intervals between costly full-scale repainting treatments.

The 2018 workshop was a pilot for future courses on outdoor painted sculpture. All of the 2018 participants had prior experience with outdoor painted sculpture and were chosen for their ability to give feedback on the format and content of the course, which will be used to inform the next workshop, in 2019.

The Surface Treatment Strategies for Outdoor Painted Sculpture workshop grew out of the Outdoor Sculpture project, which is part of the GCI's Modern and Contemporary Art Research Initiative.

Staff Update

ALAN PHENIX RETIRES

Alan Phenix, a scientist at the GCI and leader of the Science department's Treatment Studies research area, retired in early March after more than a decade at the Institute.

Alan—a paintings conservator and conservation educator, as well as a scientist—earned a bachelor's degree in chemistry and color chemistry from the University of Leeds, and a postgraduate diploma in the conservation of easel paintings from the Courtauld Institute of Art in London. He went on to teach at several institutions, including the Courtauld itself. Alan joined the GCI staff in 2006, after a period as a GCI Conservation Guest Scholar in residence from 2005 to 2006.

As the leader of the Treatment Studies research area, Alan's work focused on the evaluation and development of conservation methods and materials for the field. Some of his most important research concentrated on enlarging our understanding of the mechanisms involved in cleaning painted surfaces, including the effects of solvents on oil paints, as well as materials used in cleaning acrylic emulsion paints. But his research interests extended well beyond the cleaning of painted surfaces to include many other areas of cultural heritage research, among



Alan Phenix. Photo: Scott S. Warren, for the GCI.

them dirt deposition mechanisms, structural treatments of paintings (on both canvas and panel), material and treatments studies on polymer dispersion consolidants, coatings for metal sculpture, and the aqueous bleaching of canvas.

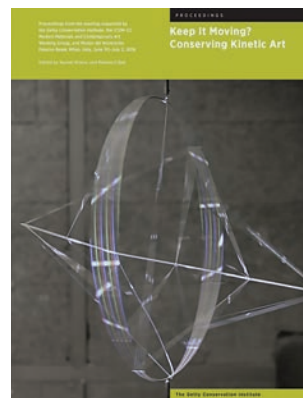
Alan's work also involved scientific and technical studies on painted works of art in collaboration with the Getty Museum and other institutions. With more than seventy publications to his name, he produced a wide range of in-depth technical studies on artists, including Boltraffio, Daubigny, Hammersley, Heemskerck, Lichtenstein, Oudry, and Pollock. The research he conducted as part of the two-year GCI-Getty Museum project on Pollock's painting *Mural* (1943) expanded our understanding of the materials and methods used by the artist to create this seminal work.

Within the Getty, Alan has been a popular and generous colleague, always willing to advise or mentor junior and midcareer conservators. Beyond the Getty, his engagement with professional colleagues included being a fellow of both AIC and IIC, as well as serving as the coordinator of one of the Paintings working groups of ICOM-CC. Esteem for his teaching skills was reflected in his 2014 appointment as the Judith Praska Distinguished Visiting Professor in Conservation and Technical Studies at New York University.

At the end of May, Alan will receive the Robert L. Feller Lifetime Achievement Award at the American Institute for Conservation's annual conference.

Alan's Getty colleagues wish him the best in his retirement—which, it is suspected, will include some continuing contributions to the conservation field.

New Publications



Keep It Moving?

Conserving Kinetic Art

Proceedings from the Meeting Organized by the Getty Conservation Institute, the ICOM-CC Modern Materials and Contemporary Art Working Group, and Museo del Novecento Palazzo Reale, Milan, Italy, June 30–July 2, 2016

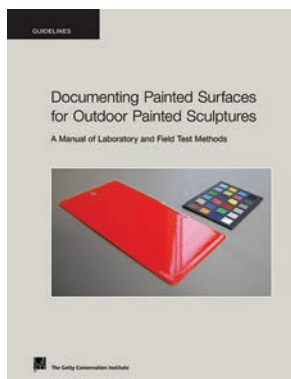
Edited by Rachel Rivenc and Reinhard Bek

Kinetic art not only includes movement but often depends on it to produce an intended effect and therefore fully realize its nature as art. It can take a multiplicity of forms and include a wide range of motion, from motorized and electrically driven movement to motion resulting from wind, light, or other sources of energy. Kinetic art emerged throughout the twentieth century and had its major development in the 1950s and 1960s.

Professionals responsible for conserving contemporary art are rethinking the concept of authenticity and solving the dichotomy often felt between original materials and functionality in the work of art. The contrast is especially acute with kinetic art, where a compromise between the two often seems impossible. Technological obsolescence and an artist's chosen technology often carrying strong sociological and historical meaning are issues that must also be considered.

Keep it Moving? Conserving Kinetic Art is available online for free. This is the first born-digital publication the GCI has published with Getty Publications using new online digital software. The online edition of the proceedings—which displays kinetic art through several video links—can be found at: getty.edu/publications/keepitmoving/

The publication is also available as EPUB, as MOBI/Kindle, and as a free PDF. In addition, print copies are available for purchase at shop.getty.edu



***Documenting Painted Surfaces for Outdoor Painted Sculptures
A Manual of Laboratory and Field Test Methods***

Julia Langenbacher and Rachel Rivenc, with contributions from Anna Flavin

Outdoor painted sculptures are exposed to harsh and uncontrolled environments and are thus highly prone to rapid deterioration and a wide range of paint coat failures. Treating these objects frequently involves the full repainting of the sculpture, which might be preceded by removing all earlier coats of paint, or stripping. This approach, which would be considered extreme or unusual in other areas of conservation, is common for outdoor painted sculptures, not only because there is often an expectation that they should look pristine, but also because the paint fills the crucial role of protecting the substrate.

Sculptures will often undergo several cycles of repainting in their lifetime. It is therefore of utmost importance to ensure that new paints provide a surface that closely reflects the work's original appearance (e.g., color, texture, and gloss level).

As a response to this problem, the Getty Conservation Institute (GCI), in collaboration with a number of artists' estates, foundations, and studios (EFS), is implementing a system of paint coupons for outdoor painted sculptures to document their original or intended appearance as the target appearance for conservators to match when implementing a conservation treatment. Paint swatches or coupons create a reliable physical reference of paint appearance and can be accurately documented for future reference.

To aid in the production of these coupons, the GCI has published *Documenting Painted Surfaces for Outdoor Painted Sculptures*. These guidelines are based on ASTM (American

Society for Testing and Materials) standards, paint industry practices, and consultations with experts in the fields of industrial paints and outdoor painted sculpture conservation, for the production and documentation of paint coupons.

The guidelines were developed with the goal of producing EFS-approved paint coupons as references for intended appearance and long-term storage, but they can also be used by anyone (conservators, artists and their studios, caretakers, and collectors) wishing to document a paint surface in a reproducible manner—for example, on the occasion of repainting or when commissioning a new outdoor painted sculpture.

This publication is available free of charge at: www.getty.edu/conservation/publications_resources/pdf_publications/documenting_painted.html

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The J. Paul Getty Trust

James Cuno, *President and Chief Executive Officer*

The Getty Conservation Institute

Timothy P. Whalen, *John E. and Louise Bryson Director*
Jeanne Marie Teutonico, *Associate Director, Programs*
Kathleen Gaines, *Associate Director, Administration*
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Susan Macdonald, *Head of Buildings and Sites*

Conservation Perspectives, The GCI Newsletter

Jeffrey Levin, *Editor*
Angela Escobar, *Assistant Editor*
Carol Hahn, *Production Assistant*
Picnic Design, *Design*
Graphic Visions, *Lithography*

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

The Getty Conservation Institute (GCI) works internationally to advance conservation practice in the visual arts—broadly interpreted to include objects, collections, architecture, and sites. The Institute serves the conservation community through scientific research, education and training, field projects, and the dissemination of information. In all its endeavors, the GCI creates and delivers knowledge that contributes to the conservation of the world's cultural heritage.

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



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The Getty Conservation Institute

1200 Getty Center Drive, Suite 700
Los Angeles, CA 90049-1684
Tel 310 440 7325
Fax 310 440 7702
gciweb@getty.edu
www.getty.edu/conservation

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For more information about the work of the GCI, see getty.edu/conservation and



CONSERVATION PERSPECTIVES

THE GCI NEWSLETTER



The ancient shrines and pagodas of Bagan in Myanmar, the capital of the region from the eleventh century to the end of the thirteenth. Photo: Jeanne Marie Teutonico, GCI.



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