

Keynote Presentations



Master Plan for the Conservation and Management of the Mogao Grottoes: Preparation and Achievements

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Abstract: *Heritage sites are unique and irreplaceable, which makes their preservation and management a great challenge. A clear master plan is essential to guide conservation and management so that site deterioration can be averted or slowed, cultural value can be determined, and utilization can be effectively coordinated along scientific lines. In this way, heritage sites can continue to serve society. This paper discusses the Master Plan for the Conservation and Management of the Mogao Grottoes, which was drawn up in accordance with the Principles for the Conservation of Heritage Sites in China (known as the China Principles) issued by China ICOMOS with the approval of the State Administration of Cultural Heritage of China. In writing the master plan, the following steps were undertaken: collection and collation of data, assessment of cultural values and significance, evaluation of current status and management, identification of main objectives and the principles for attaining them, and determination of specific project goals and the measures to reach them. The main objectives of the plan for the period 2001–10 are as follows: (1) conservation: measures implemented after research and technical interventions to preserve cultural values and prevent further deterioration, including daily maintenance, addressing safety issues and preventive measures, and visitor management; (2) research: collating, organizing, and studying the artifacts from the grottoes and the Library Cave to enrich the corpus of research on Dunhuang and human knowledge generally; (3) education; and (4) recovery of dispersed artifacts. The master plan lays out a scientific model for conservation and management. In addition, the process, from elaboration to completion, will be one in which conservation professionals and managers will be able to enhance and refine their skills. The continual improvement in preservation*

and management of the Mogao Grottoes will be guaranteed through the comprehensive, scientific, and systematic application of the master plan.

In winter 1997 a committee of cultural heritage experts convened by China's State Administration of Cultural Heritage (SACH), composed of members of the national committee of the International Council on Monuments and Sites (ICOMOS), the Getty Conservation Institute (GCI) in the United States, and the Australian Heritage Commission, initiated the drafting of the *Principles for the Conservation of Heritage Sites in China* (referred to as the China Principles). The China Principles were published in 2000 (in Chinese) by China ICOMOS. This author was among the scholars who participated. The China Principles, which are based on Chinese conservation practice, the framework of relevant laws for protection of cultural heritage, and conservation practices in the West, consist of five chapters with thirty-eight articles covering, among other matters, the conservation process, conservation principles, and conservation interventions. The guidelines are followed by a detailed commentary. This document establishes the major criteria for the conservation of China's cultural heritage and for the evaluation of the conservation work.

Prior to drafting the China Principles, the Dunhuang Academy and the Getty Conservation Institute conducted collaborative fieldwork for more than ten years. In order to apply and demonstrate the feasibility and authority of the China Principles, the Dunhuang Academy, the GCI, and the Australian Heritage Commission planned a joint effort that led ultimately to the initiation of the Mogao Grottoes Conservation and Management Master Plan. After extensive

discussions on the international level and revisions, the master plan became the first document of its kind in China to be written in accordance with the China Principles. To comply with the requirements of China’s cultural heritage law, the Mogao master plan (covering the period 2006–25) was further developed by the China Architectural Design Institute, an authorized planning entity, and approved after revisions as a legal instrument in February 2006.

Establishing the Master Plan for the Mogao Grottoes

The Mogao Grottoes of Dunhuang are a world-famous cultural heritage site representing a millennium of construction, from the fourth to the fourteenth century C.E. Over this period a rich deposit of historical data from various ages and a unique natural and cultural landscape was formed. The artistic, historic, and scientific values of the grottoes rank them among the most important cultural heritage sites in the world. Protection of the Mogao Grottoes is a responsibility that history has conferred on us. Yet, in spite of the great achievements of the Dunhuang Academy during the sixty years since its establishment, we have struggled with questions concerning the grottoes’ conservation, the methods that may appropriately be used to maintain the authenticity and integrity of the site, the principles and procedures we must follow, and the many complex factors that must be taken into consideration when intervening in the physical fabric, so as not to inadvertently or irreversibly diminish the significance.

As stated in the China Principles, conservation refers to all measures carried out to preserve the physical remains of sites and their historic settings. Therefore, the work requires arduous effort, investigation, discussion, and assessment. The initiation of a detailed plan is a necessary step. Article 9 of the China Principles states that all cultural heritage conservation work should be supervised by a systematic process, and the document’s commentary also requires that all heritage conservation organizations draw up a conservation master plan.

According to the China Principles, a master plan must include four elements: conservation measures, use, interpretation, and management. Its major contents and execution stages are research data collection, assessments of existing condition and management facilities, the establishment of goals, and the principles by which the goals can be reached. This is followed by the determination of specific objectives and the means of achieving them. The conservation process is summarized in table 1 and discussed in detail below as it applies to the Mogao Grottoes.

Significance Assessment and Assessments of Existing Condition and Management Context

Article 11 of the China Principles states that the assessment process consists of determining the values of the site, its state of preservation, and its management context. A proper assessment entails possession of comprehensive data, careful scrutiny of the data, and explanation of the value and meaning of the historical site. Therefore, a complete, accurate,

Table 1 Flowchart of the Conservation Process

Significance assessment		Assessments of existing condition and management context	
↓			
Statement of goals and the principles to be followed in achieving the goals			
↓			
Determination of objectives for 2001–10			
↓			
Establishment of Objectives and Action Plans			
Conservation subplan	Landscape and setting	Research subplan	Visitor management and interpretation subplan
Operations and management subplan	Maintenance and monitoring subplan	Staff professional training subplan	Infrastructure development subplan

and truthful collection of data is the very basis for the plan. Article 13 states that the preparation of a conservation master plan must be based on the results of the assessment.

The data collection work for the Mogao Grottoes addressed such issues as the meaning and value of the site's cultural heritage, history and state of preservation, daily maintenance, environment and setting, visitor management, exhibition display, infrastructure, construction, and operations management. This includes written documents, oral presentations, historic images and mapping information, and archaeological and technical information. The data range from historical records to current protection and management documentation. Research conducted by national and international experts on the art and artifacts in the Mogao Grottoes and the documents discovered and excavated at the site over the past century are enormous achievements, and a great deal of experience and technical information has been accumulated by the conservation work conducted at the site over the past sixty years. These constitute the foundation for the initiation of the Mogao Grottoes master plan.

Article 5 of the China Principles states that the assessment of the significance of a site should be given the highest priority throughout the entire process, since the depth and range of the understanding of the heritage art and artifacts have a direct effect on the conservation work. The values assessment was therefore of top priority in writing the master plan. With a long history and rich contents, the Mogao Grottoes and the surrounding environment have unique and multiple values, which it was important to identify. During the Mogao assessment, special effort was made to delve into the site's particular historic, artistic, social, and research significance.

Values assessment requires a long and continuous effort; the longer it takes, the more profound the results. This means that our evaluation was accompanied by unremitting research. The research work we carried out deepened our understanding of the Mogao Grottoes' cultural values, uniqueness, richness, and meaning for the world today.

In order to make the correct decisions for the conservation and management of the site, adequate assessments of the existing physical condition and the present management capabilities were also of great importance. First, the advantages and the disadvantages of conservation treatments had to be scrupulously analyzed. For example, it was determined which caves were stable and which were deteriorating. Analysis included understanding whether the condition had existed for a long time or is recent, whether the deterioration

is proceeding quickly, and the causes of the deterioration. All these issues were scientifically examined, measured, and understood.

Second, preservation of cultural heritage is closely related to the surrounding environment. The natural environment and the climate and its impact at Mogao were taken into consideration, as was the pressure of tourism.

Third, several different, or even conflicting, possible actions may follow from the assessments, and which measures are to be adopted is again guided by relevant laws and regulations. Daily maintenance of the site, environmental management, exhibitions for visitors, visitor management and services, academic research, staff training, legal status of the site, infrastructure development, and funding exerted significant influence on the execution of the Mogao Grottoes master plan. Thus all these factors deserved a place in the assessments. Management capabilities were, and will continue to be, of tremendous importance for the preservation of the caves and deserved equal attention.

To sum up, full assessment of the cultural significance of the Mogao Grottoes promoted understanding of the unique, priceless, and plural values of the site; the assessment of the state of preservation promoted understanding of the problems we are now facing; and the assessment of the management context helped us to realize the determining elements in the site's conservation and the limitations constraining our work.

Statement of Goals and the Principles to Be Followed in Achieving the Goals

Article 2 of the China Principles states that "the aim of conservation is to preserve the authenticity of all the elements of the entire heritage site and to retain for the future its historic information and all its values." Article 4 states that heritage sites should be used in a rational manner for the benefit of society.

These principles are the soul of the master plan. The fundamental aim for the conservation of the grottoes is to maintain and sustain all the historic information and cultural values that the caves carry today. Thus all possible measures should be taken to prevent natural and human damage to the caves and to use them, to the greatest possible degree, for the cultural education of society. Full-scale research into the rich resources of the grottoes is also necessary to promote Dunhuang studies at the international level. Based on the guidelines in the China Principles and on the assessment results, especially the problems we are faced with

in the protection of the grottoes, a program for 2001–10 was initiated, with the following four goals:

1. Conservation: to prevent the art and artifacts at the site from further deterioration by means of advanced technology, repair, daily maintenance, visitor management, and security measures;
2. Research: to promote Dunhuang studies and to expand human knowledge in general by means of a systematic study of the Mogao Grottoes and the historical records from the caves;
3. Education: to promote awareness and understanding of the value of the grottoes on an international scale;
4. Repatriation of dispersed documents and artifacts: although difficult at this time, the Dunhuang Academy has the long-term goal of collecting all materials currently in other countries so as to facilitate their systematic management and research work.

To achieve these goals and to avoid conservation and management errors, the Mogao Grottoes master plan has identified some necessary conservation principles. According to procedures outlined in the China Principles and based on the results of significance and condition assessments of the Mogao Grottoes, fourteen principles were determined. The principles explain why the site should be protected, how to protect the cultural heritage, what can be done, what must be done, and what must be avoided in order to maintain the integrity of the grottoes. The principles are summed up in the following four points:

1. Application of the master plan shall comply with the laws of the PRC concerning cultural heritage protection, the China Principles, international agreements on world cultural and natural heritage, and other relevant rules and regulations.
2. All conservation of and management interventions in the cultural heritage should have as little impact as possible; all activities, strategies, and measures should not damage the cultural values of the site; and all conservation interventions should be tested and evaluated beforehand.
3. The original landscape of the site and its surroundings should be preserved to the highest degree possible, no construction that interferes with the view

shall be undertaken, and no commercial activities shall be conducted in front of or near the grottoes.

4. Use of the site should be appropriate to its cultural values, and the number of tourists shall be limited to the carrying capacity of the caves.

Determination of Objectives for 2001–2010

Except for the fourth goal described above (repatriation of dispersed documents and artifacts), all goals are to be achieved in the ten-year period 2001–10. For the first goal (conservation), effective measures should be taken to protect the grottoes and their surroundings and to guarantee their daily maintenance; for the second goal (research), more effort should be made to promote Dunhuang studies in all aspects; and for the third goal (education), attracting tourists and providing exhibits should be coordinated on a scientific basis.

To achieve these three targets, management work, infrastructure development, daily operations, and staff training should all be kept in pace with one another. Accordingly, eight objectives have been determined: (1) conservation; (2) maintenance and monitoring; (3) landscape and setting; (4) research; (5) visitor management, interpretation, and exhibitions; (6) operations and management; (7) professional training for staff; and (8) infrastructure development. These objectives are coordinated through several substantive executive measures. The choice of measures required careful consideration and was based on the prerequisite of no damage to and minimization of impact on the site; at the same time attention was paid to ensuring the protection of the site's cultural values.

Using visitor management (objective 5) as an example, I highlight below the disadvantages related to tourism.

From the perspective of the master plan, the constraints are as follows:

- Most of the caves are too small for large numbers of tourists, and the number of caves that can be opened for visitors is limited.
- During the high tourist season, the temperature, humidity, carbon dioxide, and dust increase in the caves, which does great harm to the wall paintings.
- Overuse allows the caves no recovery time.
- Noise resulting from tourism activities may cause damaging vibration.
- Exposure to light, both sunlight and artificial, harms the paintings.

- The protective glass barriers inside the grottoes hamper visibility and, if broken, may damage the wall paintings.
- Lack of communication with travel agencies results in lack of information about the number and type of visitors.

From the perspective of visitors, the disadvantages are as follows:

- Dim light in the caves, lack of fresh air, and noise all diminish the quality of the visit.
- Walkways connecting the caves are narrow and result in congestion.
- The site lacks rational visitor routes to the caves and strictly enforced measures for routing on the site.
- The site lacks signs in foreign languages and internationally recognized informational symbols.
- The site lacks an efficient service center and information board.
- There is no relevant brochure or guidebook for the site.
- There is no high-tech facility for exhibits.
- The site lacks a program for educating tourists about the importance of preservation.
- There are inadequate restaurants and restrooms.

According to the Mogao Grottoes master plan, with respect to tourism, the objectives of visitor management are

- to restrict the number of visitors to the carrying capacity of the caves;
- to reasonably adjust visiting times so that visitation is better distributed throughout the year;
- to make available to visitors information on all aspects of the Mogao Grottoes, including history, art, culture, and preservation;
- to improve visiting conditions; and
- to develop a detailed plan for educating visitors about the caves and their preservation.

Substantial measures should be executed concerning each of the objectives of visitor management described above. For example, to make information available to visitors, we will develop a detailed plan for site interpretation; set up a visitor service center to inform visitors about the exhibitions at the site; design several visitor routes through the site; open more grottoes to visitors, in particular, those on the upper and middle tiers; and create more replica grottoes in the exhibition center.

Establishment of Objectives and Action Plans

According to Article 13 of the China Principles, specific plans for particular areas and components of a site shall be addressed with special action plans (known as subplans). The enormous scale and complexity of conservation work at the Mogao Grottoes required various subplans that correspond to specific areas of need and relevance. These were created after completion of the master plan. At present, a visitor management and exhibition subplan is being developed. In addition, we are executing and simultaneously improving the protection and management of the site as specified in the master plan. For example, measures are being taken to protect the caves from sandstorms, reduce humidity in the caves, and address the geologic instability of the cliff the deterioration of wall paintings. We are also conducting research into the carrying capacity of the grottoes in order to arrive at a safe number of visitors. The surrounding environment of certain important areas has also greatly improved. In accordance with the conservation subplan, we are developing professional conservation practices.

Conclusion

The master plan for the Mogao Grottoes has laid a solid foundation for the authentic and complete preservation of this historic site. Participation in the development of the master plan has helped us to improve our conservation capabilities. More important, it has brought our work to the attention of the government, our professional colleagues, and the general public. In recent years, the master plan has been applied to all areas of conservation and management work at the Mogao Grottoes, yielding many productive results.

Managing Cultural Heritage Sites: Some Parameters for Success

Sharon Sullivan

Abstract: *Modern heritage site management has developed gradually and is now a recognizable practice throughout the world. Yet it can hardly be said that site management is universally successful and well practiced. Some sites, while officially “managed,” are totally neglected or seem mired in a bog of bureaucratic inertia. Others have become elements of the local economy to such an extent that their integrity is being sacrificed to tourism. Still others are so lovingly “restored” that they seem to no longer have the values for which they are being managed.*

This paper examines some of the parameters and characteristics of successful site management that facilitate the long-term conservation of all of a site’s cultural values. It is based on an informal study of heritage sites in a range of cultural, political, and physical environments, and it uses examples of current site management in China and elsewhere to examine what constitutes successful heritage site management. In addition to good conservation policy and practice promulgated by such documents as the Burra Charter and the China Principles, key factors important in the recipe for successful site management include national and regional heritage policy and support, local community involvement and support, visitor management, funding and security, technical expertise, and staff motivation, skills, and teamwork. The importance of all these factors is discussed in this paper.

Modern cultural heritage site management has developed gradually and is now a recognizable practice throughout the world. Yet it can hardly be said that site management is universally successful and well practiced. Some sites, while officially “managed,” are totally neglected or seem mired in a bog

of bureaucratic inertia. Others have become elements of the local economy to such an extent that their integrity is being sacrificed to tourism. Still others are so lovingly “restored” that they seem to no longer have the values for which they are being managed.

This paper discusses heritage site management and its relationship to physical conservation, its importance for the ongoing sustainability of a site, and the key parameters for successful management that I see emerging in the twenty-first century. Before going further, I would like to define a few of the concepts I use.

- *Heritage site (or place).*¹ This is a site, area, or region that represents a particular focus of past human activity that we recognize as having important cultural values and that we wish to conserve. Such a site may have significant physical remains or no visible evidence of human activity, being rather the location of a past event of importance or the embodiment of a particular belief or legend. Stories, traditional uses, emotions, rituals, customs, and activities associated with the site can be an important part of its cultural heritage value. Here I restrict my discussions to heritage sites that have been recognized as having a sufficient degree of heritage value to have been given statutory protection and a management body charged with caring for them.
- *Conservation (or preservation, as it is often referred to in North American literature).* In its broad sense, as defined in the Burra Charter (Australia ICOMOS 2000),² conservation means all the processes of

looking after a site so as to retain its heritage significance. It may, according to circumstances, include the processes of retention or reintroduction of use, retention of association and meanings, maintenance, preservation, restoration, reconstruction, adaptation, interpretation, and ongoing management; it will commonly include a combination of more than one of these.

- *Heritage site management.* This is an integral part of conservation, and in this context *conservation* and *management* are often used interchangeably. If there is a difference, it is in our perception of scope. We generally regard conservation as the direct actions taken to conserve the site; management includes these actions but also a broader range of actions that will contribute indirectly to the conservation and sustainability of the site. In the China Principles (Agnew and Demas 2004),³ we find the concept *baohu cuoshi* (lit., “conserve + measures”), which conveys roughly the same meaning. The China Principles recognize the importance of heritage management and give management more emphasis than any other comparable charter. The degree to which a site’s management facilitates the long-term conservation and presentation of all its heritage values in a dynamic and integrated way determines the management’s success or failure.

Physical Conservation and Heritage Management

In this paper I use the term *physical conservation* to more narrowly denote conservation that involves physical intervention of some sort, that is, prevention of future deterioration such as by stabilization or restoration of the site’s fabric, which is its physical manifestation of heritage. In the popular mind, looking after a site properly principally means carrying out physical conservation, and the key role of those in charge of heritage sites is considered one of stabilization and restoration.

At a great site such as Mogao, we are struck immediately by the age, richness, beauty, and significance of the fabric. We also know that this precious fabric is fragile, damaged, and threatened. It is built into an unstable cliff face, on the edge of a great desert, affected by wind erosion and sand abrasion, by water damage and salt accretion, by the depredations of humans in the past and by possible overuse in the future.

In these circumstances the first priority for the managers of Mogao has rightly been the physical conservation of this fabric. The earliest efforts focused on stabilizing the cliff face, securing the caves against weathering, and basic stabilization of the painted walls and statues, along with meticulous systematic recording. A physical conservation research facility was quickly established, and work progressed from basic, emergency efforts, carried out under very difficult conditions, through a period of experimentation and learning, to the current situation of state-of-the-art work. At Mogao the senior staff are qualified experts with training in archaeology, physical conservation, historical research, and other relevant professional skills.

International partners such as the Getty Conservation Institute (GCI) were recruited to assist in this massive work of physical conservation. Examples of the innovative solutions applied to the Mogao Grottoes include a sand fence and vegetation line (Agnew 1996) and the seven years of work on cave 85 conducted jointly by the Dunhuang Academy and the GCI (described elsewhere in this volume).

As at Mogao, the perilous physical state of many great monuments of the world has meant that the first priority has often been given to conservation of the fabric. All this work was essential, and its achievement (as at Mogao) was often a necessary foundation for site conservation. My point is not that this was improper but that the attention paid to physical conservation historically has weighted the management of sites in this direction, with the key personnel being concerned with this aspect of site management and in many cases having this as their area of expertise.

Because of this emphasis, physical conservation at heritage sites has been through a long period of learning by mistakes as well as successes. The Venice Charter was developed because of the necessity to refine and control conservation practice (Sullivan 2003). The field of physical conservation has developed a firm set of ethics and principles, and it has become a discipline with a well-developed theory and practice that is increasingly rigorous and sophisticated. High-quality university-level training and graduate and postgraduate research work are regularly undertaken in this area, and the profession of conservator is well known and respected in the heritage world.

We can contrast this with the amount of attention that historically has been paid to the development of the broad discipline of heritage site management and its more specific aspects, such as personnel management, visitor and tourism management, routine maintenance, infrastructure

development, interpretation, and stakeholder and local community liaison. There are as yet few general heritage management courses, especially in China, and aspects of management other than physical conservation are sometimes seen as less prestigious, less glamorous, and less crucial to the conservation of heritage sites. This means that they are accorded less status, have less expert staff, and in general suffer from a lack of coordination and recognition.

Yet good general heritage site management, with its emphasis on utilitarian issues such as water supply or crowd control, is as crucial for the ongoing well-being and sustainability of a heritage site as is good physical conservation. And, in fact, effective heritage site management can be seen as a sheltering umbrella under which good and well-judged physical conservation can be carried out while at the same time the need for it is minimized. No prudent conservator looking for long-term results would undertake a major physical conservation program at a poorly managed site.

Urgent Need for Site Management

In many parts of the world, the requirement for good management is becoming urgent, since pressures on heritage sites are increasingly caused by overuse, misuse, national or regional development aspirations, and the often desperate needs of local people. China faces many of these problems, and we can see them being effectively addressed at Mogao. Yet it can hardly be said that heritage site management is universally as successful and well practiced as in China. We can all think of heritage sites that are poorly managed. Some sites are totally neglected or seem mired in a bog of bureaucratic inertia. Others have become elements of the local economy to such an extent that their integrity has been sacrificed to tourism (for examples, see Guolong Lai, Demas, and Agnew 2004). Some sites totally exclude or indeed make enemies of the traditional owners and the local population (see Munjeri 2004).

Challenges Facing Heritage Site Management at the National and International Levels

Successful heritage site management faces numerous challenges caused by external factors. In particular, it is very difficult, though not impossible, to effectively manage a site in a legislative and policy vacuum. There are exceptional managers who achieve this, but the odds are stacked against them. This

has been an ongoing problem in the UNESCO approach to encouraging good heritage site management among member states. UNESCO relies almost solely on the limited scope of the World Heritage Convention (UNESCO 1972) to influence site management. The Convention obliges signatory countries to establish a management regime aimed at the protection of those selected sites deemed by the World Heritage Committee “of outstanding universal value.” The Convention, however, is silent about conserving and managing sites and landscapes that are not destined for the World Heritage List but that together make up a nation’s cultural heritage.

This situation contrasts sharply with the protection of natural sites of outstanding universal value. In this case, the World Heritage Convention is backed up by UNESCO’s Man and the Biosphere Programme (www.cbd.int/convention.shtml#), which protects a much wider group of ecosystems known as Biosphere Reserves, and the Convention on Biological Diversity (UNEP 1992), under which each signatory nation agrees to establish site measures for the general protection of biodiversity wherever it occurs.

This gap in the international arrangements for the protection of cultural heritage has had disastrous management consequences for both heritage sites and landscapes generally and for many World Heritage Sites. When sites are declared World Heritage and there is no overarching national heritage protection policy or regime, they are often inundated by tourists and developers and expected to raise revenue and reflect national prestige for the state while at the same time their conservation is neglected.

Proper heritage site management needs the support and protection of overarching regional and national policy and regulation, as well as expert and administrative support systems. This should ideally include public recognition by the government of the cultural, social, and economic values of the nation’s cultural heritage generally and the development of an effective legislative and administrative regime to conserve it. If no general recording and assessment have been made of the country’s heritage, it is difficult for the manager to assess the significance of and interpret a particular heritage site. It is equally difficult, in the absence of general policies and programs, for an individual manager to liaise with the local community and to educate and involve them. Most crucially, without such a system of policies and programs, the heritage manager is isolated and unsupported at a political level. Funding is generally inadequate or lacking, and no network of expertise, support, or assistance is available.

Without the proper regulatory and support systems, the management of a particular site is often ineffective and short term. This was seen during the early conservation and management work at Olduvai, Tanzania, where important fossil sites were protected by erecting shelters. No regulatory and support systems were in place to manage the sites or to maintain the shelters, nor was there a program or policy that explained to the local community the nature of the fossil remains and the need for their protection. Consequently, the shelters have been destroyed or left to decay, and the sites, having had public attention drawn to them, are probably in a worse state than before their attempted protection (I learned of this firsthand while visiting the sites).

In contrast to the situation at Olduvai, the People's Republic of China's commitment to cultural heritage, its strong legislation, its national and regional management system, the recent adoption of the China Principles, and a bureaucratic and expert support system for sites such as Mogao make good heritage management possible and frequently apparent in China.

Good Heritage Site Management: The Essential Elements

Recognizing the Complexity of the Management Role

Successful heritage site management can be defined quite simply as the long-term conservation of all the cultural values of a site. Successful site management, however, is complex and multifaceted, and all its elements are interconnected. On-site we are dealing with a web of cultural values, with technical, social, and political problems and opportunities, as well as resource needs, and with the multiple cultural and economic connections between the heritage site and the local and broader community. All these factors are constantly changing, and the site manager needs to take them all into account to ensure long-term conservation.

While successful site management involves expert care of the site's fabric, in which many senior managers are highly qualified and skilled, it also involves dealing with issues as diverse as tourism pressure; landscaping; water management; financial management and fund-raising; liaising with the local community; finding ways to meet the needs of regional government and the tourism industry without compromising cultural values; running a training school for guides and managing visitors; designing and installing exhibitions; dealing with ongoing and regular maintenance,

aging infrastructure, and staff amenities and accommodation; and conducting conservation and academic research.

This point may seem obvious, but many managers and management structures are ill equipped to deal with this level of complexity. By concentrating on a narrow range of issues, often relating to fabric conservation, and neglecting many other elements of site management, they allow significant damage and deterioration of the site and the development of political or social issues that can endanger its long-term viability.

Finding Effective Tools to Manage Complexity

The first prerequisite for managing effectively in this complex situation is a set of principles and procedures that dissects the levels of complexity and allows an understanding of their interconnectedness, thus providing a framework for good decision making. Otherwise, there is a danger that certain problems will dominate all others, that they will be misunderstood, or that in dealing with the complexity of day-to-day issues the site manager will lose focus on the key reason for the work—the conservation of significance. Well-managed sites have a system of sifting through this complexity so that key priorities and issues emerge clearly. This framework, which is outlined in the Burra Charter and the China Principles, is illustrated by the master plan for the Mogao Grottoes (see Altenburg et al., this volume).

In brief, the day-to-day management of a heritage site, including crucial decisions that need to be made about its development or restoration or about changes to it, must be based on accurately assessing and recognizing all its cultural values, researching and assessing conservation management issues and opportunities, and exercising problem-solving skills to produce policies and strategies that result in the conservation of all its cultural values.

Identifying Values

It is now well accepted that values-based management is the key to effective conservation (see Sullivan 1997a, 1997b; Clarke 1999; Avrami, Mason, and de la Torre 2000). At many sites cultural values arise at least in part from the traditions and practices of the community, and to keep these values alive, dynamic interaction is needed with the community from which they emanate. So an assessment of values, which not only relies on the opinion of experts but also takes into account the views of the site's community and traditional

owners, is a crucial first step in good management. This has implications for the role of the site and the manager in the community, which is discussed later.

Revisions to the Burra Charter recognize the reintroduction of traditional use and the retention of association and meanings as being in many cases as important for the conservation of the site's values as protection of the site's fabric (see Walker and Marquis-Kyle 2004). A properly conducted values assessment identifies all elements of cultural significance that a site possesses and recognizes the implications for management, including potential management conflicts between these values. This assessment can be complex and difficult, because it involves making judgments about sometimes conflicting data and working with stakeholders with a broad range of views and values, but it avoids the trap of seeing heritage sites in a one-dimensional or limited way. It is crucial that the key stakeholders—those groups in the community that have traditional associations with the site or an interest in or influence on the site—and the site's management (defined in more detail later) understand and accept all the cultural values of the site.

The New South Wales National Parks and Wildlife Service is currently preparing a new management plan for Kosciuszko National Park, a huge alpine landscape in southeastern New South Wales. The park managers had previously recognized the existence of cultural heritage sites within the park, but they had tended to downplay the traditional connections of the Aboriginal people and the local descendants of settlers with the park in order to stress its pristine natural values and because some of the cultural heritage values were considered to be in conflict with these natural values.

Only in the new management plan have the park managers acknowledged the contemporary importance of the park's cultural landscape to Aboriginal and settler populations who generated this landscape and who still have living cultural connections with it. Partnerships with local communities, families, and individuals with strong connections to the park not only acknowledge the legitimacy and authenticity of the histories; they also provide the best means of ensuring that the diversity of cultural values associated with the park survives (Sullivan and Lennon 2003).

The values described in the new management plan were developed with input from a community forum, an independent scientific committee, and an Aboriginal working group. The plan acknowledges that park management will be based on recognition that all elements of the landscape had been influenced by human activities to varying

degrees and that the traditions associated with this landscape are still strong and legitimate. One tangible policy result is the decision to allow ongoing use, maintenance, and, in some cases, restoration or reconstruction of traditional mountain huts where there is still a living family tradition of use and association.

This project has had immense benefits. Not only has the cultural significance of Kosciuszko National Park been greatly enriched, but the stories of its traditional owners have been legitimized. The groups with traditional ties to the site now have a certain degree of ownership of the plan and the management process. Rather than oppose elements of park management, they have become to some extent allies of effective park management (Lennon 2005; for discussion of similar issues in China, see Han Feng 2005).

At a well-managed site recognition is also given to the importance of economic values, and the site is managed to maintain or, in some cases, enhance them. In the case of legally designated heritage sites, however, economic values are derived values that arise from the cultural significance of the site; in the long run, they will exist only as long as the cultural significance is conserved. For an interesting case study of managing a balance between the cultural and economic values of a site, see the case study on Port Arthur in Tasmania (Mason, Myers, and de la Torre 2005: 116–69).

Identifying and Researching Issues and Opportunities

Another element of successful site management is a realistic and full assessment of the issues, problems, and opportunities of the management environment. Conserving the values of a site relies on identifying and solving issues and problems that threaten these values. Managers often feel that they instinctively know what these issues are, but this is not always the case. Good research has long been recognized as a prerequisite to physical conservation work, but it equally needs to be a prerequisite to heritage management in general. The manager needs to know details such as financial projections; visitor numbers, behavior, and profile; makeup and strengths and weaknesses of the management team's experience; infrastructure issues; local community expectations; and political and social attitudes.

One problem of management assessment work is that identifying unsolved issues can be politically unwelcome and can be taken as a sign that the manager has failed in some way. But good management requires that the same objectivity be applied to researching these issues as to researching the condition of the site's fabric.

A good example of management research is described in the paper on visitor surveys in this volume by Li Ping and colleagues. Detailed surveys and observations of visitors at the Mogao caves, carried out as part of the management assessment for the Mogao master plan, provided new data about visitor trends, behavior, expectations, attitudes toward conservation, and satisfaction level. These surveys in turn provided vital information for planning for future conservation of the wall paintings, management, and visitor education. For instance, observations of visitors during the height of the tourism season revealed that even under supervision, 3.9 percent of visitors (708 people) touched the surfaces of the wall paintings. This was due in part to overcrowding during certain parts of the day, and strategies are now being developed to resolve this issue.

Developing Realistic Policies and Strategies

Identifying a site's values and its management and conservation issues needs to be followed by the development of policies and strategies aimed at the maximum conservation of all site values. This requires a site manager with flexibility, strong problem-solving skills, tolerance of uncertainty and change, and pragmatism about what needs to be achieved, with the overall aim of conserving the site's cultural values.

The development of policies and strategies is an ongoing process that all successful site managers engage in whether or not they have reached the stage of producing a formal management plan. Successfully handling this process, by whatever means, is much more important than having a beautiful plan. The process is iterative and does not have a finite end. One key factor in its success is recognizing that the situation is so complex that it is often crucial to establish priorities and to proceed in small steps to effect incremental improvements rather than expect all problems to be solved in the short term.

The successful site manager practices the art of the possible. Solutions must be feasible and practical. This often means not being seduced by advanced technology, or by elaborate schemes that may look good but are beyond the capacity of the site's resources. On the other hand, even small changes can have a dramatic effect and can be built on to continue to improve the management situation. At Mogao, for example, the requirement that all incoming tourist groups book at least one day in advance has dramatically reduced crowding and greatly improved the visitor experience. Though this was a simple change, its implementation called for strategic thinking, a good communications strategy, teamwork, and some significant risk management by senior staff.

Making Site Management Work

So far I have discussed a process for heritage site management that is increasingly recognized in documents such as the China Principles, the English Heritage planning principles (Heritage Lottery Fund 1998), and the Burra Charter. But these documents do not cover some important elements of good management, that is, how to make the process work in practice to achieve a successful result. I want to discuss some of these issues now.

Involving Staff

A management structure that allows the processes of significance assessment, issues analysis, and developing policies and strategies outlined above to be understood by all staff members, and to be owned and worked on by them, is essential for good management. Specialists have a significant role in site management, but the interdependence of all the measures that need to be put in place to conserve a site means that staff in all the management departments (in China, this is commonly conservation, visitor reception, security, museum management, and artifact curation) need to have an understanding of and a commitment to the key elements of the significance of the site, the key management and conservation issues facing the site, and the proposed solutions and their priority and timing.

The only way to effectively achieve this understanding and commitment is to involve staff from all key management areas in the site's values assessment and consequent decision-making processes. Staff need to be able to provide input informed by their expertise or experience; to be involved in the research needed to tease out and quantify issues; and to be convinced about and committed to the solutions. In many instances, such a process will reveal gaps in needed expertise or actual management presence that can then be rectified. For example, in China there is often no expertise in visitor management, but recognition of this fact makes it possible to bring in the missing expertise or to train key personnel.

Beginning this process of involvement is often difficult. It cuts across many entrenched practices and expectations, and it can bring to light deeply buried and significant issues. Such a process can also be threatening to the most qualified and specialized members of the management team, who may feel a loss of control. It can also be threatening to staff, such as the works supervisor or the accountant, who have never been involved in the larger site issues and who may not feel responsible for them or competent to address them. With

good leadership, however, this process is empowering and can immensely strengthen the capacity of managers to carry out effective conservation measures. It also almost invariably raises staff morale and their level of responsibility and initiative.

The aim of inclusive involvement is to build up within the organization a culture of staff dedication to excellence in site conservation that acknowledges the role of every individual. Once established, such a culture will become self-sustaining, because staff developed and treated in this way acquire a genuine love of their work and of the site, and they develop initiative and problem-solving skills that can often protect the site from threats such as political interference or loss of resources. This is why bringing in a consultant to solve problems or write a management plan will produce a missed opportunity to involve all staff and will rarely be successful. Without staff involvement, good management is very difficult, and it is likely to be temporary, dependent on the whims and skills of a particular manager. Thus development of staff expertise, involvement, morale, and understanding is an essential part of the conservation strategy for every site.

Good conservation arises from careful consideration of all the values in conjunction with the circumstances of the time. Detailed rules that do not take account of this inevitably become more and more rigid and fossilize the conservation effort. Managers should instead invest in ongoing awareness raising and training for staff, all of whom are custodians of the site's values. The achievement of staff commitment and management expertise is an essential part of the conservation planning and implementation process.

The Old Parliament House in Canberra, Australia, is an example of how to successfully involve staff in managing a site. This is Australia's first permanent Parliament House, and its fabric and associations have a high cultural significance for most Australians. Many visitors come to this site; schoolchildren reenact parliamentary debates here, many exhibitions and public functions are held here, and it is the home of the National Portrait Gallery. The fabric of the Old Parliament House is very important, but equally important to its continuing cultural significance are good public access, keeping it a lively and vibrant place, and using modern technology to tell its story and educate its visitors. Interaction with visitors and the place's present physical configuration and ambience are an important part of its significance.

A thorough analysis of the significance of nearly every room of the Old Parliament House and a detailed conservation plan for its fabric had been developed. Responding to

the data, however, resulted in a complex range of operational rules relating to fabric conservation that gradually tied down managers, making day-to-day planning and decision making very difficult. Consequently, staff trying to operate the building felt restricted and hampered in their efforts to keep the site alive and relevant for its public.

This situation was resolved by developing a new conservation plan through a series of workshops with staff and management. The new plan emphasizes a relatively simple decision-making process: for any action staff may undertake, they need to consider if it is likely to enhance or threaten elements of the cultural value of the site. All staff are not experts in conservation, or in the detailed history of the site, but all are now familiar with the major elements of the significance of the building, and all have a responsibility for conducting an assessment based on this as a first step in their planning, whether for a new exhibition, the installation of audiovisual equipment, or a proposed function. The staff assessment is then discussed with the site's heritage experts before a decision is made. If necessary, the proposed action is revised or an alternative solution found. The result of this new system is that all key staff are partners in the job of significance conservation, take this into account in all decision making, and feel less constrained and much more aware of the reasons for conservation decisions (Godden Mackay Logan Heritage Consultants 2005).

Engaging the Local Community

A heritage site is essentially a part of the community, in the final analysis owned by that community and not by the manager or by the government. The site is the living link between the community and its heritage; it animates this heritage and is the ultimate basis for all the more formal values we professionals give it.

Engaging the local community in decision making is often seen as a risky strategy by management staff, because it means giving up a degree of control to the local community or to other stakeholders, or at the very least involving them in discussions about significance or management. Management, however, must recognize that important aspects of a site's cultural value are in the custodianship of the community and that they must play the role of facilitator rather than boss or opponent in working with that community. Increasingly today the community is finding its voice, and it is dangerous to ignore it or attempt to sidestep it. A site's manager and staff may be able to come up with theoretically perfect solutions to certain management issues by excluding the community, but

the real danger exists that this may mean that crucial political and social support for the site is lost and, as a result, elements of its significance are endangered.

The word *community* is difficult to define. It can mean the general community (the citizens of the nation or state) or the particular community or social group associated with the heritage site. Among those who might have a legitimate connection to the site are the following:

- *local residents*, or those who live around the site or in associated local or regional centers;
- *people with traditional links to the site*, for example, traditional owners, relatives of historic figures associated with the site, people whose personal histories are connected to the site, members of a religion or society for which the site is significant;
- *people with particular knowledge about the site*, for example, long-term residents, local scholars, and custodians of information;
- *those who visit the site* to explore its cultural heritage or for relaxation or recreation; and
- *those with a statutory, political, or pecuniary interest in the site*, such as department officials, politicians, local leaders, businesspeople and developers, those in the tourism and accommodation industry.

All these groups are stakeholders. Successful management involves dealing effectively with all of these people, including difficult as well as helpful sections of the community. When these groups are involved in the consultation process they are able to feel part of the process and voice their legitimate concerns and needs. It also gives managers the opportunity to explain their point of view and to work toward a win-win solution to problems. Ideally, the manager should consult with stakeholders at every major step of the planning and implementation process, seeking views on the significance of the site, on the issues and opportunities relating to it, and on the proposed solutions.

It may seem that businesspeople, tourism operators, and developers should not have a place at the table during these discussions. Leaving them out, however, can result in their opposition to key conservation objectives (Sullivan 1997b). Though some of their motives may be exploitative, their cooperation can very often assist in finding good management solutions for the site. In the final analysis, the long-term conservation of the site is in the interest of these user groups and the site managers.

Effective community involvement does not mean that a manager relinquishes control, but it can lead to solutions that are less perfect than ones the manager may have been able to design in isolation. On the other hand, solving 80 percent of a problem, or moving in slow steps that the community can accept to overcome key issues, is much better than coming up with a “perfect” solution that cannot be implemented because of community opposition.

The experience of community involvement is very heartening. Gathering people around the table to discuss an issue in which all have an interest and giving them the opportunity to voice their own concerns and issues, if done in good faith, is less risky than one might think. Whenever I have involved the community in decision making it has resulted in overriding agreement that conservation of the site is important. After that, managing issues and finding solutions has been much more straightforward, as was the case at Kosciuszko National Park.

Local communities may be in desperate need of the basic requirements for a secure and minimally comfortable life. In these circumstances, understanding and embracing cultural heritage values and aspirations is not necessarily a priority, unless we can establish real congruence between heritage conservation and the needs of the community. Successful heritage site management will happen only when this is achieved. This is often difficult, especially in regimes where the local community is excluded from real decision making and consideration and the national interest is seen as paramount. The site manager is not a miracle worker, but it has been my experience that we can always involve the community at some level, even if it is at first difficult to achieve and initially produces a minimal outcome.

Finally, winning the confidence and support of the government officials and/or department to whom they are responsible is crucial to heritage site managers. This may not be easy, but site managers need to pay special attention to this relationship, through good communication, responsiveness, and low-key promotion of achievements and priorities for the heritage site.

Practicing Advocacy and Promotion

The successful heritage site manager practices advocacy. It is essential to actively promote the site’s values and its cultural and economic importance to the community and to the government. By this, I do not mean indiscriminate encouragement of visitors, or promotion of inappropriate use. I mean

well-planned and steady promotion to key stakeholders that is aimed at enhancing and reinforcing the site's values. A strategy to achieve this is essential and is actually part of conservation goals, since successful promotion of the site's values will enhance those values and help to secure their survival. For the manager, practicing advocacy and promotion may mean a variety of activities that at first sight do not appear to have a lot to do with heritage conservation.

Port Arthur in Tasmania is one of Australia's most important historic sites. It tells part of the story of the origins of the Australian nation as a penal colony designed by imperial Britain to solve the problem of the great crime wave that resulted from the displacement of people caused by the industrial revolution and from the continued subjugation of Ireland.

At the Port Arthur Historic Site, selling all the values of the site to a wider audience has played an important role in building support. The site managers have done this in a number of ways:

- by hosting a series of international conferences with invited scholars with expertise in the significance of the site, publishing the conference proceedings, and actively encouraging visits by international experts to the site;
- by operating a research center dedicated to convict studies in partnership with a number of universities, holding a series of summer schools for post-graduate students in archaeology and architecture, and operating a user-friendly service where visitors or members of the public can research their convict ancestry;
- by setting up a descendants group for people whose ancestors were at the site as convicts or staff, which has regular contact with the site, is consulted about management, and helps to promote the site nationally and internationally;
- by making the site available for local use through a variety of means, such as providing free entry, keys, fishing rights, and social activities and by maintaining the local parish church and cricket pitch; and
- by running an active program of conservation assistance for local people with heritage sites in the region and by playing an active role in heritage conservation in Tasmania generally.

The Port Arthur Historic Site has also contributed considerable funding and assistance to regional tourism efforts, and it promotes other tourist attractions in the region in conjunction with or as alternatives to the Port Arthur Historic Site. The site is actively involved in cultural events in Tasmania, hosts those that are congruent with the significance of the site, and promotes Tasmanian produce and crafts at the site.

Managers liaise frequently with Tasmanian and national politicians, community leaders, and heritage experts about the site's values and needs. They also take every opportunity to attend relevant conferences and speaking engagements.

Managers provide a continuous flow of positive news stories, actively promote on-site improvements, and ensure the attendance of key leaders and public figures at site events. Equally important, they deal quickly, honestly, and openly with any perceived problems with the management of the site or complaints from visitors or the community. The staff aims to treat visitors in such a way that more than 95 percent report that they had a memorable or very memorable experience and, consequently, act as ambassadors for the site and its management.

All these promotional activities are an important part of the site's conservation strategy: to explore and explain the value of Port Arthur as a heritage site with difficult and painful associations; to increase the public's understanding and appreciation of these associations; to explore issues related to conserving and presenting such sites; to provide input and involvement for locals; to draw international attention to the significance of Port Arthur; and to further increase government and local respect for the site's values.

Managing Financial Resources

Good resource management is essential. There is never enough money to operate a heritage site in the way management and staff feel it should be operated, but wise use of the resources that are available and taking opportunities to increase them are an essential part of the manager's role.

Successful site managers give priority to a realistic and carefully worked out budget that ensures that all available money is wisely spent on key priorities. It is important to put time and effort into presenting a convincing financial plan to government and other key sponsors of the site.

In a recent bid to persuade the Tasmanian government of the need for ongoing conservation funding, the Board of the Port Arthur Historic Site commissioned an indepen-

dent review of progress on its conservation plan objectives. In addition, a study by well-known economists produced a favorable picture of the benefits that the site brings to the local community and to Tasmania overall (Felmingham, Paulin, and Page 2004). This study demonstrated that the government's investment in the site to date had a significant multiplier effect on investment and job growth in the regional community, as well as a significant effect on Tasmania generally. Both the independent review and the economic study were influential in the site's successful bid for funding.

Conclusion

The aim of this paper is to show that the heritage site manager and the site's senior team require not only expertise in their particular disciplines but also a much greater range of skills and attributes to successfully carry out their complex and difficult roles. My experience indicates that the following are some of the qualities that make for successful site managers:

- vision
- integrity
- communication skills
- strategic and entrepreneurial skills
- leadership and teamwork
- problem-solving abilities
- flexibility and pragmatism

Above all, the manager needs the courage and skill to take the initiative in conserving and managing the site rather than simply reacting to problems and pressures as they arise. Having a vision for the site and moving steadily to implement it in the ways outlined above can produce powerful results.

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Notes

- 1 Although heritage *site* is the more commonly used and understood terminology, the Burra Charter uses heritage *place* to mean the same thing.
- 2 The Burra Charter is a conservation charter developed by Australia ICOMOS and is widely used as a standard in Australia and internationally.
- 3 The China Principles are a set of heritage conservation principles developed by the Chinese cultural heritage authorities for use in China.

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China's Policy in Relation to International Exchange and Cooperation in Cultural Heritage Conservation in China

Zhang Wenbin

Abstract: *China's State Administration of Cultural Heritage (SACH) has adopted several measures to expand its international collaboration and exchange programs in the conservation and museum fields. It sought approval from the Standing Committee of the National People's Congress for China to be a signatory to the Convention Concerning the Protection of the World Cultural and Natural Heritage and to become a member of three major international organizations for the conservation of cultural heritage. SACH has organized well-received exhibitions of Chinese cultural artifacts, and it has encouraged and supported various forms and levels of international collaborative projects. It has also fostered collaborations on the scientific conservation and management of cultural relics to improve the quality of this work in China, as exemplified by the application of the Principles for the Conservation of Heritage Sites in China, issued by China ICOMOS, while actively promoting collaborative projects in field archaeology. Finally, it has promoted academic exchanges and study abroad. However, much work remains to be done. This paper proposes steps to be taken to improve China's participation in international conservation activities.*

Since implementation of China's policy of reform and openness to the outside world, the government has paid much more attention to international exchange and cooperation in support of cultural heritage conservation, and it has taken an active role in joining international activities in the fields of cultural heritage and museums. This has resulted in abundant benefits and considerable advances.

China's Growth in International Conservation Work

By 2000 China had signed four international treaties and joined three international organizations (ICOM, ICOMOS, and ICCROM) concerned with cultural heritage conservation and study. The UNESCO World Heritage Committee held a meeting in China in 2004, and ICOMOS held its 15th General Assembly in Xi'an in 2005.

The Chinese government actively seeks international cooperation to counter theft and smuggling of its cultural heritage, and a workshop on this subject was held with UNESCO. Furthermore, the government signed the Pact of Conservation and Reclaiming of Heritage with Peru in 2000. In regard to UNESCO's 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property, the government requested of the United States a restriction on the import of cultural heritage items from China.

In recent years China has held many cultural heritage exhibitions abroad on various subjects. Both the response to these exhibitions and the social benefits derived from them have been great, especially in the China-France Cultural Year starting in 2003. Meanwhile, exhibitions held in China include the *Peru Cultural Heritage Exhibition*, the *Maya Civilization Exhibition*, the *Elite Exhibition of Japanese Cultural Heritage*, the *Egypt Cultural Heritage Exhibition*, and the *Ancient Roman Civilization Exhibition*.

China's government has aided a conservation project to protect a Cambodian temple at Angkor Wat, and the

project is nearly completed. The work of the Chinese engineers and workers has won trust and recognition from Cambodia. Now China and Cambodia have signed a new agreement for continuing cooperation.

More and more cooperative projects of various forms and at different levels are being submitted for approval to the central and local governments in China. For example, China and Italy have set up a Conservation Training Center at China's National Institute for the Conservation of Cultural Property in Beijing; experts from China, the United States, and Australia developed the *Principles for the Conservation of Heritage Sites in China* (the China Principles), which have been approved by the State Administration for Cultural Heritage (SACH) and formally issued in Chinese and English by China ICOMOS; and Chinese museums have expanded their exchanges on management, training, and academic study with several famous foreign museums.

In addition to the above, China's efforts in the area of archaeological investigation and excavation in cooperation with other countries have become established and effective, scientific technology and academic standards are being emphasized more and research directions clarified, and the scope of cooperation has been broadened. China's initiative to organize an archaeological team in Pakistan is progressing.

Challenges Facing China in Conservation Activities

Although international exchanges and cooperation related to conserving China's cultural heritage have become richer, with broader potential, problems and deficiencies remain. Some of these issues are summarized below.

Lack of a Strategic Structure and Action Plan

In 2001, at the national cultural heritage meeting on foreign affairs, SACH pointed out that the general goal of its work is to actively initiate improvements in the management and academic standards of activities in archaeology and museology, in order to advance the status of China's cultural heritage in the world. To realize this goal, we must develop a strategic structure and action plan, articulate heritage significance, prioritize work in a clear and consistent way, determine key points, establish operational criteria, and steadily improve performance.

Lack of Full Integration into the International Heritage Community

China has not yet fully entered the international heritage community, and it has not yet exerted influence appropriate to its vast heritage resources. China is a latecomer to the international heritage community. For historical reasons, her voice and influence are small, and the country's awareness and practice in cultural heritage conservation do not yet match that of the international heritage community, especially with regard to research and the ability to follow up on the newest trends. China is also hampered by its inability to set up effective and vital contacts with international organizations.

Poorly Implemented Regulations for Managing Overseas Exhibitions

Regulation and control of the export of cultural heritage artifacts and overseas exhibitions needs to be enhanced. The government has approved many large-scale exhibitions held overseas. However, the number of first-rank objects of national importance on exhibition has exceeded the quantity regulated by law, which increases risk. In addition, the Chinese government has not initiated most of these exhibitions; therefore, their location and timing were not logically arranged. Furthermore, security and safety for the objects were potential problems.

Lack of Knowledge about the International Conservation Community

All levels of China's heritage management units as well as individual professionals are not fully familiar with the relevant international conservation organizations, pacts and agreements, international cooperation requirements, and opportunities. Because of differences in history, culture, and language, China has difficulty working with international organizations and following international conventions. It is not uncommon for heritage management units and individuals to enthusiastically accept funding and gifts from foreign collaborators and volunteers while at the same time ignoring the specific requirements of the cooperation. Because of the substantial differences between Chinese and foreign experts in terms of capabilities and ideas about heritage conservation, collaborative projects often result in the two sides parting on bad terms. Furthermore, some heritage management units are not autho-

rized by law to ratify overseas exhibitions, and they regard such exhibitions as an opportunity to go abroad. Some Chinese exhibitors are careless and have too little oversight, to the embarrassment of their foreign hosts. These problems all reflect the lower level of daily work and lack of experience in dealing with foreign heritage and museum organizations and professionals.

Steps to Improve China's Participation in International Conservation Activities

The great achievements China has made in both its economy and its social development provide a wonderful opportunity, as never before, to develop international exchanges and collaborations on cultural heritage conservation. However, this remains a difficult task. I suggest the following steps to improve China's participation in the international conservation community.

- Make efforts to establish and maintain new relationships with cultural heritage administrations of countries with advanced conservation practice and enhance existing collaborative relationships.
- Make good use of intergovernmental collaborations to motivate and guide projects operated by Chinese nongovernmental organizations. Make full use of embassies and consulates to publicize the results and achievements of heritage conservation in China, while also requesting that the Chinese government provide sufficient support and materials.

- To enhance the role of personnel at each level of government, train foreign affairs personnel well in international relations and collaborations.
- Promote exchange and collaboration between scholars and between personnel in cultural heritage conservation administration and management. Enhance the legal system with regard to cultural heritage conservation, implement all rules, and abide by the law.
- Devise detailed strategies and plans to strengthen macroscale management.
- Make an effort to import advanced management ideas, as well as academic views and theories, and upgrade technology and equipment.
- Make staff training for international exchange and cooperation in cultural heritage conservation the top priority.

Conclusion

In the long term, training and improving the quality of staff are at the root of developing China's capabilities in cultural heritage conservation and management. International exchanges and cooperation are the most important way to achieve this goal, and the Dunhuang Academy is a successful example of this. A further example is the support that SACH provides the National Institute for the Conservation of Cultural Property in cooperating with the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) to make training the top priority for Chinese conservation professionals.

Choices and Judgment: The Professional Conservator at the Interface

Sharon Cather

Abstract: *The China Principles define a clear structure for the conservation of heritage sites. Effective implementation of this process depends on the cooperation of professionals from various disciplines, reflecting prevailing international practice. Moreover, the China Principles are explicit in requiring that practitioners have specialist training and, for important aspects of the conservation process, that decision making be based on periodic review by a committee of experts. Clearly, this structure is designed to ensure a cautious and well-informed approach and relies fundamentally on the availability of qualified professionals. Although modern conservation demands expertise from a remarkable range of disciplines—from materials science to art history, from laser physics to cultural anthropology—the role of the conservator remains both central and extraordinarily challenging. This paper therefore focuses on what is expected of the professional conservator in the context of modern multidisciplinary conservation. It seems an opportune moment to do this given the important initiative of the Dunhuang Academy and Lanzhou University to provide education in wall painting conservation.*

Characterizing Current Conservation Practice

The second Silk Road conference provides an ideal opportunity for reviewing the evolution of approaches to the preservation of the cultural heritage and for examining the role of the conservator in that context. It is ideal for several reasons: the conference program exemplifies the extraordinary range of conservation activities and the professionals who undertake them; the balance of contributions—from man-

agement theory to materials testing—reflects increasingly accepted priorities for allocating resources; and, since the first Silk Road conference in 1993, the China Principles have been adopted and tangibly implemented at Mogao in the management plan and the cave 85 conservation program. There has been very significant progress.

How have approaches to conservation evolved in recent decades?¹ Broadly, the principal trends are toward preventive conservation and toward considering the entire site, ensemble, or collection (figs. 1, 2). These trends are led by ethics and by management theory. It is an approach that is more justifiable in terms of benefits and costs. There is also a trend toward minimal intervention, doing “as much as necessary . . . [but] as little as possible” (Australia ICOMOS 1999: preamble). This too is a consequence of applying newly formulated ethics more rigorously and of spreading scarce resources as effectively as possible: it is more ethical *and* more economical to do as little as possible.

Together with these trends to prevent decay, to conserve whole sites rather than individual objects, and to intervene minimally, there has been a redefinition of what conservation is about, what it is we are trying to preserve. This is expressed well in the China Principles: “the aim of conservation is to preserve the authenticity of all the elements of the entire heritage site and to retain for the future its historic information and all its values” (art. 2). Unpacking this compressed definition, we can see that values (significance) and authenticity assume a new prominence in conservation theory. Values, of course, change over time and with respect to various stakeholders. Recognition of that inevitable change should make us very cautious. Moreover,

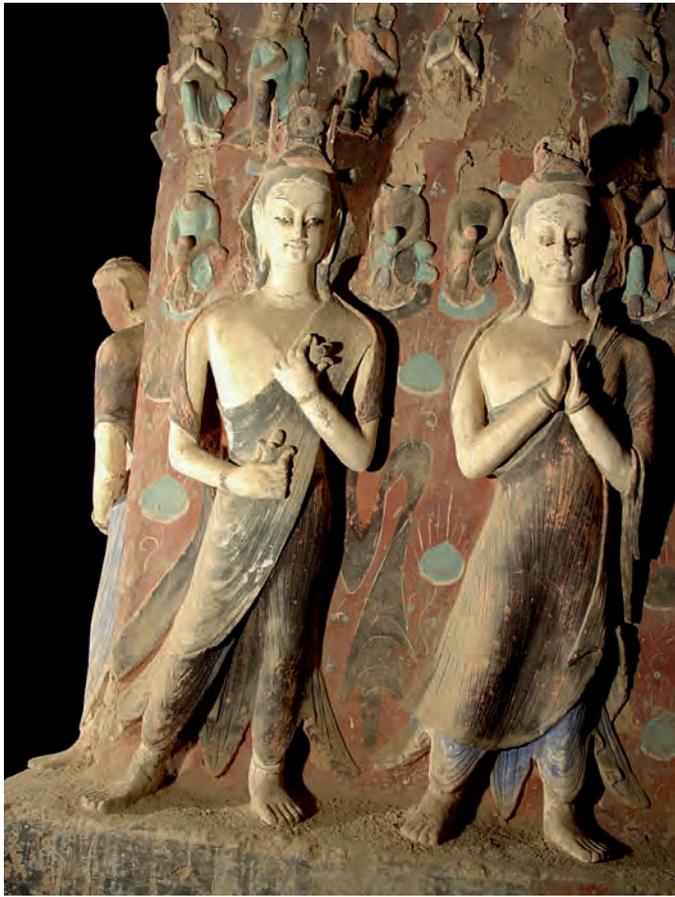


FIGURE 1 Mogao, cave 260. Bodhisattvas in the N. Wei scheme of ca. 520/30. Photo © J. Paul Getty Trust

the obligation is emphatically to the future and rejects the implicit notion—so evident in past conservation approaches—that the current generation has the right to consume or to permanently alter the cultural heritage.

This evolved conservation approach is more economical (over the long term), more ethical, and more difficult. The economy of preventive conservation, including maintenance, is probably self-evident; the similar approach in health care—preventive medicine—provides a compelling model. However, the issue of whether it is more ethical to privilege the rights of future generations and to define values in an inclusive way is likely to be a matter of individual view. For this aspect, an obvious comparison is with environmental ethics, where positions tend to divide between assigning “extrinsic” and “intrinsic” values to the environment; that is, between an extrinsic, anthropocentric view in which values



FIGURE 2 View of part of the cliff face at Mogao. Conservation and management of the entire site are a priority of the Dunhuang Academy. Photo © S. Rickerby

are defined only by the potential for human exploitation and the alternate view that acknowledges intrinsic, inherent rights of the ecosphere, independent of humans.

And in what ways is this contemporary approach to preservation more difficult? Preventive conservation is far more challenging than remedial conservation. It requires an understanding of complex open systems that is sufficient to allow diagnosis, risk assessment, and prediction of the effects of preventive interventions.² This requires considerable knowledge of the original and added materials, of their current condition and their probable response (physical and chemical) to the changes we make to reduce decay. This is exceedingly difficult and makes one think immediately of the law of unintended consequences. While an apposite example has occurred at Mogao (Agnew 2003: 76–78), it is a phenomenon that is perhaps more familiar in the natural world. For example, the introduction of cane toads to Australia in 1935 for pest control has had catastrophic unintended consequences. In conservation, although research and investigation are now increasingly targeted at trying to increase our knowledge and skills aimed at understanding and predicting behavior of our complex systems, we have still barely scratched the surface.³

Compared with the resources spent on remedial interventions, funding for research is extremely scarce. This is in part because remedial interventions are often considered urgent (even though persuasive evidence may be lacking) and in part because research is a long-term investment, typically without immediately obvious benefit. Clearly, this bias in favor of urgency is not peculiar to conservation, and again the medical analogy is appropriate.

Preventive conservation, by definition, means intervening against the causes of the problems. In museums, where agents that cause deterioration—such as light, humidity, and pollution—can potentially be controlled, preventive conservation has made very considerable strides in recent decades. However, for site conservation, interventions relating to the causes of deterioration typically involve changing an aspect of the site and/or its use that is normally the responsibility of individuals who may only rarely—or indeed never—be directly involved in conservation. For example, preventive conservation may involve adjustments to the use of a building; it may be necessary for stakeholders to reduce or eliminate heating, even though they may be more interested in short-term comfort, *their* comfort, than in long-term preservation (Bläuer Böhm et al. 2001). Or, perhaps more familiar in the present context, it may be necessary to restrict access to part or all of a site and, in special cases, to make it indefinitely inaccessible.⁴

Terminology

Before proceeding with a discussion of the central role of the professional conservator in this conservation process, there are several basic notions that underpin the arguments in this paper and require definition. They are *professional*, *conservator*, *competency*, *interface*, and *judgment*. It seems sensible to be explicit about how they are being used in this specific context. For the first three, useful definitions are given below.⁵

- **Professional:** “a person (or work of such a person) with the following attributes: service orientation, making expertise available to others, based on a distinctive body of knowledge and skills underpinned by abilities and values, autonomy in performing work within defined boundaries, public recognition of the authority of the practitioner by virtue of working to ethical standards and being accountable.”
- **Conservator:** “a professional who has the training, knowledge, skills, experience and understanding to act with the aim of preserving cultural heritage for the future.”
- **Competency:** “specialist knowledge or skills required to perform a job function.”

If, then, a conservator is a professional competent to preserve the cultural heritage, how do we define *interface* and *judgment* in our conservation context? The usual definition of *interface*, whether dealing with computers or with chemistry, is a “shared boundary” between two distinct things.⁶ Further, an interface can also be “the overlap where two theories or phenomena affect each other or have links with each other,”⁷ while in computing, an interface has an active role in allowing communication across this shared boundary. So, for the present discussion, my operational definitions are as follows:

- **Interface:** the shared boundary between the object to be conserved and the options for its conservation.
- **Conservator:** the intermediary at that interface with the professional competency to facilitate communication about the object and its potential response among multidisciplinary professionals and stakeholders.

Defining *judgment*—that is, professional judgment—is much more difficult. Looking to other disciplines for definitions, it was anticipated that there were likely to be similarities in issues of professional judgment in medical practice and in conservation. This is because they have a number of features in common: extremely limited resources in the face of high demand, a tension between competing claims for remedial versus preventive intervention, a perceived urgency to intervene, a reliance on symptoms (for conservation, this is condition; for medicine, it is how the patient “presents”), a very large number of variables that interact in a complex and often unpredictable manner, a need to interpret a wide range of complex data in relation to a specific patient, and a need to interface effectively among specialists and patients.

A study by Eraut and du Boulay (2000) on medical professional judgment provides apposite comparisons for conservation. They note that a key goal of their research was to determine the nature of medical competence and judg-

ment. Their study suggests that “good” professional medical judgment may involve

- discerning the key features of a patient’s problem in a more complex way;
- going beyond the guidelines;
- checking out expertise intuitively but rationally;
- making small approximate decisions and readjusting; and
- being prepared to do nothing.

Moreover, they found that the “most salient attributes of judgement . . . concerned making holistic and balanced decisions in situations of uncertainty and complexity.” Thus situations in which “good judgment” was required included, among others,

- decisions based on fuzzy logic in situations too complex to fully understand;
- ill-defined situations that are complex, diffuse, and muddled;
- high-risk situations;
- deciding between maximally and minimally invasive procedures (or doing neither); and
- balancing cost and quality.

There are remarkable similarities with current approaches to conservation, including the recognition that

- minimal or no intervention should always be an option;
- complex problems should be considered as holistically as possible; and
- an incremental and iterative approach is appropriate in complex situations.

It is this last point, applying an incremental and iterative approach to solving complex conservation problems, that I turn to next.

Addressing Complex Problems with an Incremental Approach and Iterative Method

A fundamental and unavoidable condition of conservation is the issue of scarce resources. All resources are scarce—funding, expertise, time, and, not least, access. The obvious consequence is that we need to allocate these resources

wisely. Moreover, we have a strong obligation to spend them ethically, so as to derive the greatest benefit. By applying an iterative approach to our complex problems, we allocate our resources more responsibly and arrive at more persuasive solutions.

An incremental approach recognizes that complex problems are best tackled in stages; it recognizes that diagnostic investigations and information gathering are, unfortunately, not as straightforward as we might hope. Basically, it aims to divide problem solving into separate components in order to address them in a sequence that facilitates and defines subsequent investigations. Such an approach is often problematic for managers because it presumes that decisions regarding resource allocation can likewise be made in stages, making budgeting more difficult. It also runs the very real risk that the required resources may not be available at later stages.⁸

An iterative method attempts to address a problem by finding *successive approximations* to obtain *more accurate* solutions. A simplistic example usefully demonstrates the method:

Think of a number between 1 and 100. A friend must guess the number in the minimum number of attempts, and all you can answer is “too high” or “too low.” Your friend will make guesses based on your answers that gradually get closer and closer to the correct number.

A sensible friend will halve the possibilities at each stage (e.g., 50, 75, . . .), arriving at the answer in a maximum of six to seven “guesses.” If we understand that each of our guesses represents a significant allocation of our limited resources, then it becomes clear that they should be well considered.

This method—aiming to find “successive approximations to obtain more accurate solutions”—recognizes that our problems are extremely complex and that we cannot expect to find precise, definitive answers. The iterative method is especially appropriate for conservation for the following reasons:

- It deals with a large number of variables.
- It is resource effective because it directs and focuses investigations.
- It addresses a multidisciplinary approach because data are regularly interpreted in relation to the original problems and hypotheses.

Iterative Method

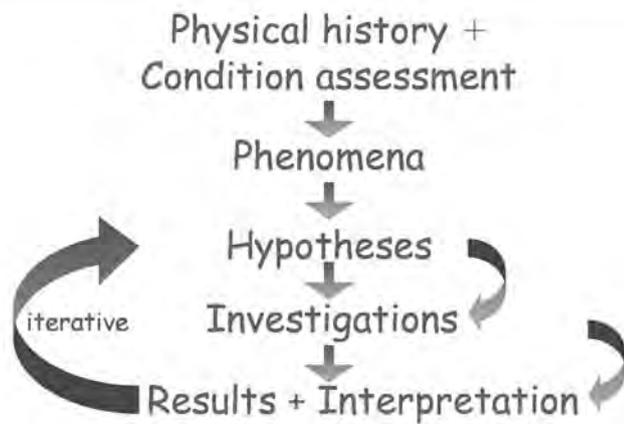


FIGURE 3 Iterative method: components and sequence.
© Courtauld Institute

- It requires revision of hypotheses based on the data collected.

The iterative method allows us to allocate our resources incrementally (fig. 3). It provides a structure for managing problem solving. It provides periodic checks both on the direction and on the success of investigations by examin-

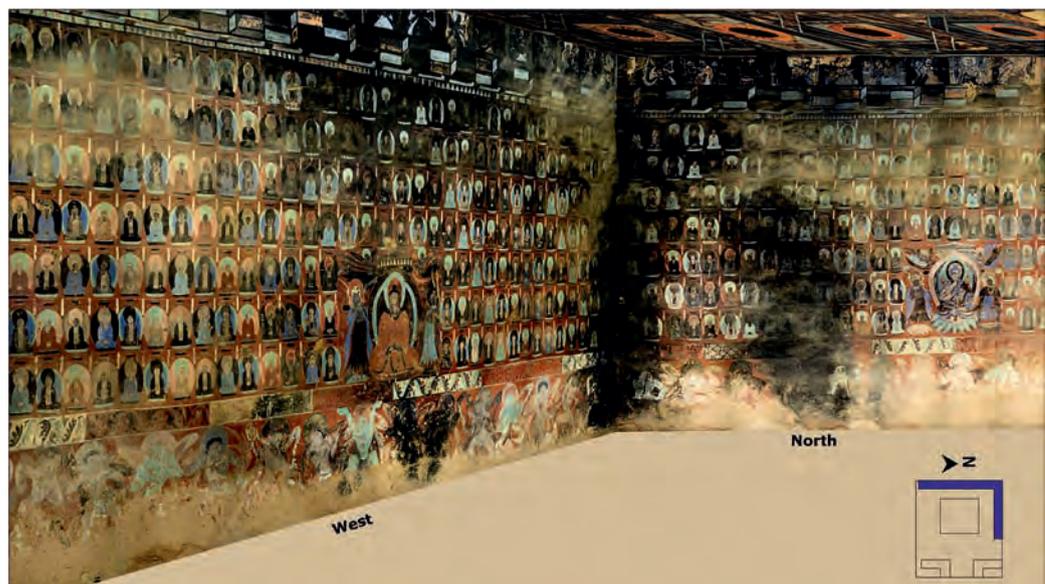
ing their results. It engages the full range of professionals involved so that the problem solving can be kept on track. It also needs to be managed and directed, and in this the role of the professional conservator is central.

What Complexity?

All conservation deals with complex problems. So what is it that makes wall painting conservation so much more challenging?

- Wall paintings are completely and unavoidably physically dependent on their supporting structures; conserving a wall painting without ensuring the state of conservation of its support would be irresponsible.
- They are composed of layered porous materials, their porosity connecting them to one another, to their support, and to the ambient environment.
- They are part of an open physical system that very probably cannot be controlled, even minimally.
- They are very large, often hundreds of square meters.
- Finally, they are discontinuous, meaning that a large scheme may have areas that are missing or partly overlaid with later decoration or have been interrupted by architectural alterations.

FIGURE 4 Effects of habitation fires from White Russian soldiers interned in cave 260 in 1922, shown on splayed mosaiced images of the north and west walls surrounding the central pillar. Basemap images © Dunhuang Academy. Mosaicing and graphics © Courtauld Institute



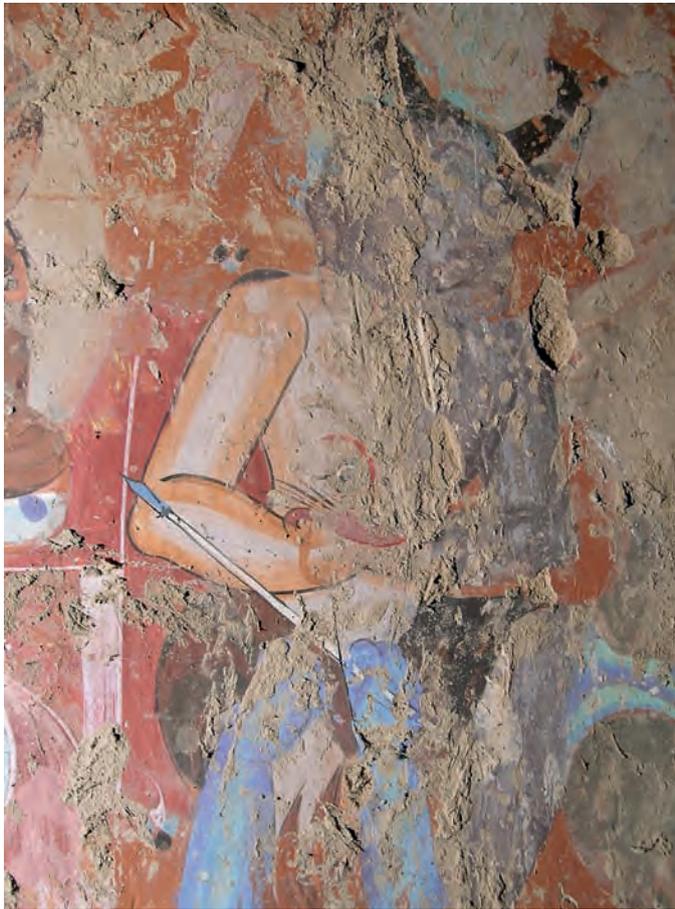
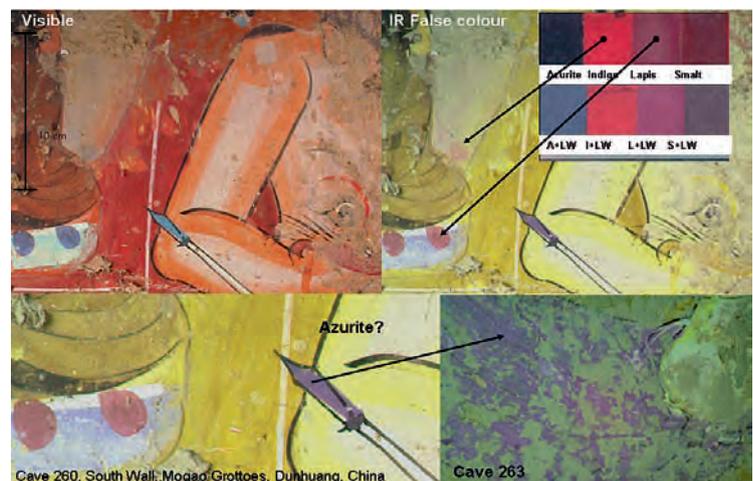


FIGURE 5 Mogao, cave 260. An area protected by a Song period architectural addition (removed in the 20th century) is relatively unaltered. Original flesh tones and the organic colorant glaze on the red background contrast markedly with the same features in the unprotected area of the figure. Photo © Courtauld Institute

FIGURE 6 Mogao, cave 260. Exceptional preservation of the painting in figure 5 facilitates analysis by means of false-color infrared imaging. © Courtauld Institute; imaging by G. Verri

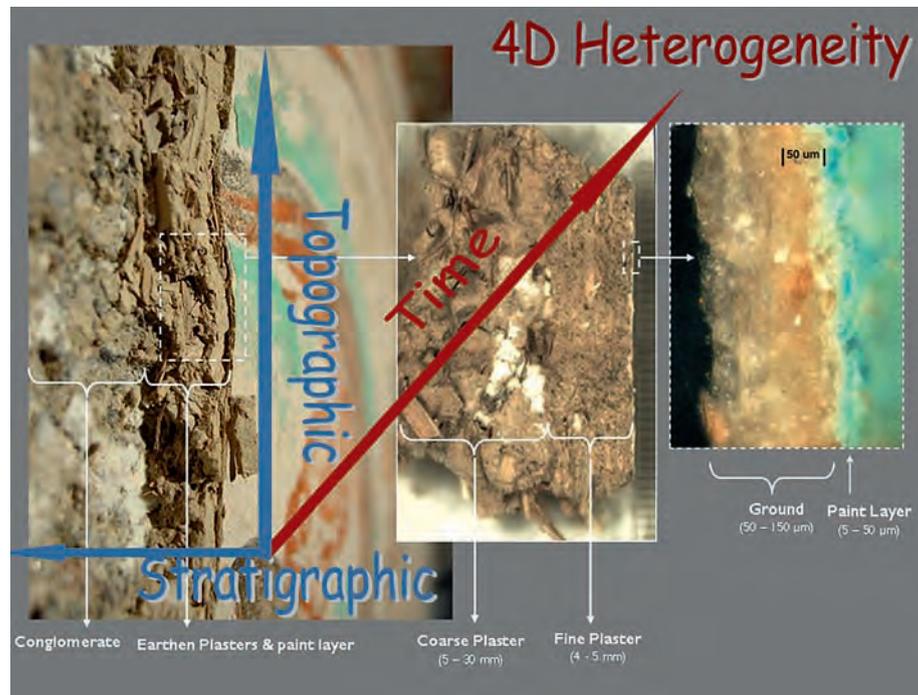


These factors combine to make wall paintings exceedingly heterogeneous; their technology and present condition vary enormously within the same painting (figs. 4–6). Because they are large and old, they are exposed to widely varying conditions from one area to another and over hundreds of years. Even at the Mogao Grottoes, where many painted caves have escaped radical alteration or major losses, the present condition of the wall paintings may change significantly from one area to the next. A good example of this is the fading of the organic colorants that were widely used in the original paintings.

This heterogeneity is four-dimensional. To the familiar two dimensions of the painting’s surface must be added the third dimension of the painting in depth, its stratigraphy. Wall paintings tend to have complex stratigraphies; they have not only multiple paint layers, metal foils, and attachments but also grounds, plaster layers, and the supporting structure. This stratigraphic complexity—and heterogeneity—is illustrated in figure 7, which shows all the components of the ninth-century Tang wall painting in cave 85 at the Mogao Grottoes.⁹ Finally, we need to add the fourth dimension, time. Wall paintings typically have a long history—a long *physical* history. Because they are part of the fabric, they are highly susceptible to change: deliberate alterations to the structure due to changes in fashion, use, patronage, or function; inadvertent structural damage due to natural catastrophes (e.g., earthquake, flooding); gradual “natural” decay due to use and the environment; and damage and deterioration from vandalism, iconoclasm, and, increasingly, tourism.

This heterogeneity vastly complicates all our efforts to understand the painting—that is, the present condition of

FIGURE 7 Four-dimensional heterogeneity in wall painting comprises the two dimensions of the topography, the third of the stratigraphy, and the fourth of time. Image © J. Paul Getty Trust. Graphics © Courtauld Institute



the original materials—because that condition varies literally from one point to the next. And it can vary significantly. It is well known that the distribution of contaminants, such as salts, is extremely heterogeneous. But we also need to remember that wall paintings have not only a complex stratigraphy but also a considerable surface area that has inevitably been exposed to differing environmental conditions and, more recently, different remedial treatments. When these differences are multiplied by time, the potential variation is daunting.

Choices and Judgment

To make informed decisions about conserving wall paintings, it is essential to try to understand both their original and their present—inevitably altered—condition. This “reconstruction” of the passage of the painting through time is termed assembling its physical history. The evidence on which the physical history is based may include historical documents—images (drawings or photographs), written records, and so on. Much more often, however, the evidence is circumstantial. For example, we may be able to *see* that there is a later architectural feature inserted, or blackening from fires used for habitation, or recent mechanical damage from tourists. More often, however, circumstantial evi-

dence is far more subtle and requires interpretation based on knowledge, experience, and comparable examples. Indeed, interpretation of circumstantial evidence must often remain a hypothesis until corroborating evidence is found.

Having assessed the present condition and assembled a physical history, it should then be possible to develop some hypotheses about the causes of any ongoing deterioration. The task for the professional conservator is to distinguish between past and present decay, to determine whether the causes of the problems are solely in the past or whether they are active and deterioration is continuing (Cather 2003: 64–66). Although this is a difficult process, it can and must be done.

Moreover, it needs to be undertaken iteratively, as outlined in the schema in figure 3, above. In this iterative process, determining the physical history and the present condition of the painting is the first essential step. As all experienced conservators know, understanding these two aspects is always interlinked: as the knowledge of the physical history accumulates, it informs an understanding of the present condition, while at the same time examination and recording of the condition will enrich an understanding of the physical history and focus lines of further investigation. That is why they are shown here as the combined starting point. This has implications for considering the risks inherent in dividing responsibilities. If it is decided by project

managers that these two activities will be undertaken by separate specialists—and this does occur—then there must also be the commitment, funding, and structure for regular, effective exchange and interpretation of information so that the crucial synergy in these two activities is not sacrificed. Perhaps even more important, it should be emphasized that only an experienced specialist conservator is competent to assess condition. Though it may be argued that the process of recording condition—usually computer-based graphic documentation—can benefit from specialist technical knowledge of hardware and software, it is still *what* is recorded and not *how* it is recorded that is of most importance. Our fascination with documentation technology is fading as the hard issues of cost, interoperability, communication, and long-term access are catching up with us.¹⁰

If it is assumed that we are undertaking this investigation process because there is a perceived problem (imminent risk of loss of original material), the next step is to define the manifestations—the phenomena—of the problems. As in the medical field, in conservation our problems are phenomenological. In medicine the patient presents with symptoms; it is also worth noting that in medicine the patient's (and family's) physical history is an important element to consider in both the diagnosis and the treatment. While defining and characterizing these condition phenomena are necessary, they are by no means straightforward. Broadly, conservators aim to do so without assigning causes to the condition they are recording. For example, a prudent conservator might define and record a condition phenomenon as “microflaking” but not “microflaking due to salts.” At this stage, the possibility that the microflaking is due to salts must remain a hypothesis to be investigated. It is all too easy to jump to wrong conclusions if causes are assigned too early in the investigation process. For this reason—and for several other very good reasons—the recent trend is to compile a visual glossary. Its function is to name, define, and describe the phenomenon and, importantly, to include a representative image (Wong 2003: 51–52).

Once the phenomena—symptoms—of our problems have been characterized in relation to the physical history and condition, the next step is to develop hypotheses about their causes. It is assumed that we have already established that the problems are *ongoing*; otherwise, diagnostic investigations to determine the causes and/or activation mechanisms are simply not necessary.¹¹ Developing these hypotheses requires considerable knowledge and experience. It is especially difficult because the same phenomenon may

result from any of several different causes, and conversely, the same cause may result in a variety of different phenomena. Returning to the medical analogy, if a patient presents with a fever it is quite obvious that there can be a wide range of possible causes.

Having established potential hypotheses, in order to proceed with the investigations designed to test them it is necessary to establish a priority and a sequence, to determine which of the phenomena is more critical for the preservation of the wall painting, which of the competing hypotheses is most likely, and therefore what is the most effective allocation of scarce resources. An example may help to clarify this. Moisture is a common cause of the deterioration of wall paintings. But moisture may be either liquid or vapor, and the processes for determining which is the source of the problem are very different. They differ not only in method but also in resource allocation, since investigating water vapor typically consumes far more time and money. In this case, condition is an extraordinarily powerful tool for deciding which—liquid or vapor—is more likely to be a problem and should therefore be investigated, and it can also provide the basis for determining appropriate sampling strategies (Cather 2003: 72–74). The professional wall painting conservator has a central role in this process of determining hypotheses, then prioritizing and sequencing investigations, which often involves a range of related disciplines and experts.

The iterative method then continues with investigations to test the hypotheses. What is significant here is that it is the hypotheses that are being tested. There are no standard investigations to undertake; there are no boxes to check in a list of ideal investigations. If we accept that our resources are scarce, then this clear targeted allocation of them is the most effective and ethical approach.

Finally, the results of these investigations must be interpreted in relation to the original hypotheses. This should be done as soon as possible and considered by all the relevant professionals. All too often results of such specialist investigations are set aside as data for a final report, whereas their real value is as an integral part of the problem-solving process. It is essential that they be interpreted and disseminated so that if the hypothesis is not supported by the results of the investigations, then it can be modified, alternative investigations can be determined, or it can simply be rejected. This timely feedback is a crucial aspect of the iterative method and presumes that specialists communicate effectively.

It becomes fairly clear that this approach to conservation—in which it is considered important to determine

the causes of the ongoing problems so that preventive or passive interventions can be undertaken—is a genuine problem for managers. However experienced and knowledgeable the experts are, it is simply not possible to cost this process at the outset. It is possible to make estimates, but they are inevitably based on presumptions that may well prove wrong. Nonetheless, most conservators are coerced into doing this. Clearly, this is a much greater issue than can be aired in the present context. However, it remains the responsibility of the conservator to communicate this uncertainty.

Choices and judgment obviously extend to remedial interventions. Indeed, they are much better understood in that context, hence the emphasis here on the less familiar diagnostic phases of the overall process. In remedial treatments the role of the professional conservator is more broadly recognized; here it is defined as acting as the intermediary at the interface, with the professional competency to facilitate communication with multidisciplinary professionals and stakeholders about the object and its potential response.

The Multidisciplinary Conservation Process

Conservation is global in much the same way that science is global. In conservation, the tools, the methods, and the approaches are—or are quickly becoming—the same throughout the world. Certainly that is the expectation of the international community, as reflected in charters and by professional bodies. But conservation education is not. It is based on local—usually national but also regional—educational structures and on the market, unfortunately driven more by prospective students than by informed stakeholders. This results in a chaotic provision of “training” at all levels and of varying lengths, from a few weeks to several years. It means that the expectation of professionalism in conservation is hampered by erratic educational provision.¹²

This situation is complicated by widely varying infrastructures for the conservation of cultural heritage. However, a relatively recent improvement is the development of the theory and practice of site management (Sullivan, this volume). Managing cultural heritage is emerging as a new discipline and is still in its formative stages. Conservators and managers play complementary roles in preserving cultural heritage, and it is important that they understand not only the processes of conservation but also their respective roles and competencies within that process. As a multidisciplinary endeavor, conservation relies on effective teamwork and communication.

Managers, by definition, have a pivotal role in site conservation. Competent conservators recognize this. Moreover, site management issues have become an essential component of the conservation curriculum. What is needed now is the mutual recognition of the complexities and challenges of each role and the ways in which these professionals must interact. If the conservator is at the interface of the object and the options for preserving it, then the manager is the professional responsible for overseeing the quality of the process outlined above and for implementing the informed decisions. One of those responsibilities is to ensure that physical conservation is the responsibility of competent professional conservators. All too often “conservators” without qualifications and with wholly inappropriate experience are employed instead. A parallel issue is the substitution of technicians for conservators. While it may be argued that in some specific contexts technicians do have a valid role, it is the manager’s responsibility to ensure that the activities of technicians are limited to clear and explicitly assessed competencies. Moreover, they must also ensure that the conservation decisions are made by qualified professionals. This does not mean that they must have a detailed knowledge of conservation, but it does mean that they need to understand the process and to recognize the need for qualified professionals to undertake this complex, multidisciplinary endeavor. Only in this way can we tackle the massive complexities of a site such as Mogao. Only by working together, recognizing and fulfilling our mutually dependent roles, can we have some confidence that the decisions we make on behalf of future generations are genuinely “as much as necessary . . . [but] as little as possible.”

Acknowledgments

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Lorinda Wong, Stephen Paine, Sophie Stewart, Rachel Burch, Robert Gowing, Stephanie Bogin, Emily Howe, Jaana Loring, Charlotte Martin de Fonjaudran, Austin Nevin, and Sibylla Tringham.

Notes

- 1 While recognizing the importance of the intangible cultural heritage, the current discussion focuses on the tangible.
- 2 In a strict sense, the term *open system* refers to thermodynamics (and, more recently, computing). “The definition of an open system assumes that there are supplies of energy that cannot be depleted; in practice, this energy is supplied from some source in the surrounding environment, which can be treated as infinite for the purposes of study” (http://en.wikipedia.org/wiki/Open_system_%28system_theory%29). For our purposes, we can accept the idea of external energy—in our case, the environment—and add the notion that in many, or even most, cases the potential for controlling that energy is small or nonexistent.
- 3 For example, the lack of postintervention assessment, whether of preventive or remedial interventions, is a major stumbling block. It is very rarely funded for site conservation. Nor do we have adequately developed methods to undertake it successfully; this would certainly require planning and a high level of recording at the time of the intervention.
- 4 In the context of site conservation, a significant example is the reburial of the Laetoli hominid trackway by the Getty Conservation Institute (Agnew and Demas 1998). An important precedent in a museum context is the case of the *Très Riches Heures*; this exceedingly important illuminated manuscript was put into permanent dark storage in 1986 by the Musée Condé, Chantilly (Camille 1990). The 2008 IIC Congress addressed the implied antagonism between conservation and access, including in a paper by Andrew Thorn titled “Access Denied” (2008).
- 5 Definitions are typically specific to their context. A wonderful example is this definition of *competency*: “The ability of prokaryotes to stably incorporate exogenous DNA fragments from the environment into their genomes” (www.nature.com/nrg/journal/v4/n2/glossary/nrg1000_glossary.html). The definitions used for *professional*, *conservator*, and *competency* were selected on the basis of their appropriateness for the present context and are from, respectively, Engineering Council of South Africa, Standards and Procedures System (www.ee.wits.ac.za/~ecsa/gen/g-04.htm#Professional); ECCO Professional Guidelines I—The Profession: 2002; and www.environment.gov.au/settlements/industry/finance/glossary.html.
- 6 For computing, see www.nps.gov/gis/gps/glossary.htm; and for chemistry, wordnet.princeton.edu/perl/webwn.

- 7 wordnet.princeton.edu/perl/webwn.
- 8 Similar issues arise with conservation interventions. Managers want hard costings at the outset, even though we all know that there are likely to be unforeseen—indeed unforeseeable—problems that will arise. Although this is a significant problem for site conservation, it is rarely raised.
- 9 See relevant papers on the cave 85 project, this volume.
- 10 ICCROM’s publication of its 1999 research seminar on graphic documentation for wall painting conservation (Schmid 2000) remains the best general source for both technical options and informed views. For a significant contribution to the critical assessment of documentation generally, see Wong et al., this volume.
- 11 For clarification of the differences between causes and activation mechanisms and, therefore, between preventive and passive conservation interventions, see Cather 2003: 69–70.
- 12 For a discussion of conservation education and the challenges it poses, see Cather 2001.

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