

PART ONE

# **International Collaboration**



# UNESCO Support for Cultural Heritage Conservation in China

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**Abstract:** UNESCO is an intergovernmental agency that functions as a catalyst for international cooperation under the principles of excellence and innovation in alliance and partnership. In fulfilling its leadership role, UNESCO seeks to ensure a responsible framework for the implementation of multilateral and bilateral projects at the regional and national levels. Four UNESCO-supported conservation projects in China are described in this paper: the ancient ruins of Jiaohe, Hanyuan Hall of Daming Palace, Kumtura Caves of the Thousand Buddhas, and Longmen Grottoes. All four projects were supported by the UNESCO/Japan Trust Fund for the Preservation of World Cultural Heritage, which provided generous technical, scientific, and material assistance from 2001 through 2007. The goal of these projects is to strengthen collaboration among research scientists, academic scholars, and government authorities from specialized Chinese and Japanese establishments; build local capacity in cultural heritage conservation; and achieve a well-managed site to ensure its long-term existence. The projects emphasize the importance of interdisciplinary education and training in cultural heritage conservation and the value of mutual collaboration and communication.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is a specialized agency of the United Nations whose mission is to create the conditions for genuine dialogue among nations based on respect for shared values and the dignity of each civilization and culture. The constitution of UNESCO was established in November 1945, and one month later its headquarters were set up in Paris. As of 2006, the organization comprised 191 Member States and six Associate Members.

Until the 1960s, the protection of cultural heritage within national boundaries was considered a domestic affair and the responsibility of the state. This changed after Egypt and Sudan submitted an urgent appeal to UNESCO in 1959 for help salvaging endangered monumental sites in Nubia. The construction of the Aswan Dam on the Nile threatened to submerge Nubian monuments from Abu Simbel to Philae. On March 8, 1960, Vittorino Veronese, then director-general of UNESCO, issued a call for action among all national governments, organizations, public and private funding, and individual patrons to provide technical and financial assistance for the safeguarding of the Nubian monuments.

The UNESCO effort to rescue the Abu Simbel temple from the dam on the Nile began in 1962 and lasted eighteen years. Encouraged by the success of this initiative, many countries turned to UNESCO for support from the international community to preserve national archaeological treasures. The actions undertaken to salvage the monuments of Nubia, therefore, presented a new direction and focus for UNESCO, as well as the international community, in the conservation and protection of historical monuments as part of the world's common cultural heritage. In 1972 the World Heritage Convention was passed at the General Session of UNESCO, providing the first permanent legal, administrative, and financial framework for international cooperation in safeguarding the cultural and natural heritage of humanity. The convention introduced World Heritage as a concept that transcends political and regional boundaries. It aims to raise awareness among the people of a nation that their cultural heritage is irreplaceable and that responsibility for its protection ultimately lies in their hands.

However, the convention also recognizes that it is the task of the international community to support the protection of world heritage and to assist those countries that lack the resources to properly protect their heritage. Although it is beyond the means of the World Heritage Committee to respond to every application for technical cooperation, organized funding on the basis of voluntary contributions from Member States is available through UNESCO. One important donor is the government of Japan, which established the Japanese Funds-in-Trust for the Preservation of World Cultural Heritage in 1989. As of 2004, the Japan Trust Fund had assisted in the protection of more than thirty-one sites in twenty-four countries, mainly in Asia.

### **UNESCO's Role in Cultural Heritage Conservation in China**

Since economic reforms were first implemented in the early 1980s, China has adopted many policies that focus on investing in urban infrastructure and human resources to nurture the growth of cities, industry, agricultural cooperatives, and foreign exchange. Such rapid development has created significant external costs, including urban growth, environmental degradation, and unrestricted tourism, that severely threaten the future of China's ancient heritage.

Recognizing the magnitude of the problem, the Chinese government has focused on implementing effective legal, organizational, and educational measures. Beginning in the mid-1980s, the government collaborated with UNESCO to increase international cooperation and exchange and to help improve cultural heritage protection in China. Several conferences were organized, such as the Asia Regional Conference on the Technical Preservation of Cultural Relics held in Beijing in 1986. This conference became a focal point for conservationists throughout Asia.

This type of cooperation expanded in the 1990s with increased support from UNESCO and from the State Administration for Cultural Heritage of China (SACH). From 1990 to 1995, training seminars were held on mural conservation, traditional architecture conservation theory, grotto conservation, and wooden architecture conservation techniques. These seminars capitalized on national and international expertise to introduce advanced technology and new ideas in cultural heritage conservation to practitioners in China.

In 1991 UNESCO used special funds from the International Committee for the Protection of the Great

Wall and Venice to help China repair the west side of the Mutianyu section of the Great Wall. In July of the same year, Mount Huang (Huangshan), a scenic landmark situated in Anhui province, received emergency assistance from the World Heritage Fund to restore traditional structures damaged by heavy flooding. In 1994 preservation of the Peking Man Site at Zhoukoudian also received emergency funding. Other projects supported by UNESCO include the installation of a security system at the museum of the Qing Imperial Mountain Resort and its outlying temples at Chengde, Hebei province; organization of a training course in 1987 on the management of world heritage in China; an emergency rehabilitation and restoration plan of the Old Town of Lijiang in Yunnan undertaken in 1996–97 in the aftermath of a large earthquake; and the preservation of traditional streets in Suzhou, Lijiang, Beijing, and Lhasa.

In December 1985 China ratified the World Heritage Convention. As of 2006, thirty-three designated cultural, natural, and mixed properties from China have been inscribed on the World Heritage List.

### **The UNESCO Office Beijing**

The UNESCO Office Beijing was created in 1984 as the UNESCO office in China for science and technology. Since then, the office has gradually expanded its activities and territory covering northeast Asia to also include sectors for culture, education, the social sciences, and communication and information. In January 2002 the UNESCO Office Beijing became the cluster office for the East Asian region, which includes the Democratic People's Republic of Korea (DPRK), Japan, Mongolia, the People's Republic of China, and the Republic of Korea (ROK). The main purposes of the UNESCO Office Beijing are (1) to implement UNESCO programs with consideration of the East Asian region's interests and circumstances and (2) to articulate the current and future needs of the East Asian Member States and to facilitate the incorporation of these needs within the framework of UNESCO programs.

The UNESCO Office Beijing works in close collaboration with local governments and with organizations affiliated with the government to strengthen cultural heritage protection in northeast Asia, where many of the world's ancient civilizations originated. In addition to UNESCO's regular programs, the Chinese government receives assistance through the UNESCO Office Beijing in applying for extrabudgetary programming.

## UNESCO Projects in China

Under the UNESCO/Japan Funds-in-Trust for the Preservation of World Cultural Heritage, China received assistance for several important conservation projects: the ancient ruins of Jiaohe, Hanyuan Hall of Daming Palace, Kumtura Caves of the Thousand Buddhas, and Longmen Grottoes. The Jiaohe and Hanyuan Hall projects were completed in 1996 and 2003, respectively. Work on the Longmen Grottoes and the Kumtura Caves is scheduled for completion in 2008. Each project is administered under the executive agency of UNESCO. The managing agency is SACH, which authorizes the work of a local implementing agency such as the Longmen Grottoes Research Institute or the Xinjiang Bureau of Cultural Relics. The collaboration engages the work of Chinese and Japanese experts, who are affiliated with various universities and research institutes in China and Japan.

### Conservation of the Ancient Ruins of Jiaohe

The Conservation of the Ancient Ruins of Jiaohe was the first UNESCO/Japan Funds-in-Trust project to be implemented in China. Historical records show that Jiaohe was the earliest political, economic, and cultural center of the Turpan basin in Xinjiang Uyghur Autonomous Region more than two thousand years ago. Beginning in the Han dynasty (206 B.C.E.–220 C.E.), Jiaohe played an important role in facilitating cultural exchange between China and the West as one of the major central Asian trading capitals of the Silk Road. Today, Jiaohe is a rare example of a well-preserved ancient city with earthen architectural ruins that cover 22 hectares of the 35-hectare site. The existing structures are mostly remnants from the third to sixth century C.E.

In 1993 the UNESCO Office Beijing signed a three-year contract with SACH for a \$1 million (USD) project to protect Jiaohe (fig. 1). Several objectives were established, including



**FIGURE 1** Ancient city of Jiaohe, Xinjiang Uyghur Autonomous Region.



**FIGURE 2** Visitor path at Jiaohe.

the detailed compilation of research, experimental analysis, archaeological excavation, atmospheric monitoring, area mapping, partial site restoration, and construction of a flood control measure and visitor path (fig. 2), as well as a master plan for the protection of Jiaohe. The project, which was successfully completed in 1996, provided a solid foundation for the future of Jiaohe and imparted valuable experience in the protection of other Chinese heritage sites.

### Conservation of Hanyuan Hall of Daming Palace

Located northeast of Xi'an in Shaanxi province, Daming Palace existed as the largest Tang dynasty (618–907 C.E.) imperial palace in the city of Chang'an for over two centuries and was the site of many stately occasions. Important diplomatic exchanges were held in Hanyuan Hall, the main hall of the palace, before it was destroyed in a fire in 886. Today, the ruins of Daming Palace are part of the cultural legacy of the world.

What remains of Hanyuan Hall is its earthen foundation, an elevated platform measuring approximately 15 meters high, 200 meters wide, and 100 meters long that serves to commemorate the imposing splendor of Tang dynasty architecture. The conservation initiative undertaken by UNESCO, China, and Japan ensures that the foundation of Hanyuan Hall survives as an on-site museum to educate the public about the history of Sino-Japanese diplomatic exchange.

Preventive conservation measures began in 1993 and led to the adoption of the formal Plan of Action by the UNESCO Office Beijing and SACH on July 24, 1995. The two-phase conservation efforts lasted almost ten years, with most of the work concluding in late March 2003. Based on an extensive analysis of archaeological finds and scholarly documentation, the work included protecting the Hanyuan Hall foundation with an added layer of brick. In addition, Tang dynasty building materials and construction techniques were replicated as closely as possible in the restoration of the base of two pavilions, two passageways, and the site of Tang brick kilns that were part of the Hanyuan Hall complex. These structures have been protected, are accessible to the public, and constitute an important part of the on-site museum.

### Conservation of the Kumtura Caves of the Thousand Buddhas

The Kumtura Caves of the Thousand Buddhas are situated 25 kilometers west of Kuqa (Kucha) in the Xinjiang Uyghur Autonomous Region (fig. 3). This important site along the



**FIGURE 3** Kumtura Thousand Buddha Caves along the Muzat River, Xinjiang Uyghur Autonomous Region.

ancient Silk Road was created by the Quici, Turk, Han, Huigu, and Turpan peoples over a period of six hundred years, from the fifth through the eleventh century C.E. The oldest of the 112 remaining cave temples dates to more than fifteen hundred years ago. The Kumtura caves contain a wealth of unique art and architecture, including Quici, Han, and Huigu inscriptions, which provide a firsthand source of information on the history of central Asia. The caves have attracted the attention of scholars from China and abroad and are of great international significance for their blending of Eastern and Western cultural traditions, as well as their exceptional historic, scientific, and artistic value.

The Kumtura caves were severely damaged during the spread of Islam through central Asia in the ninth century. Nomads and visitors using the caves as temporary living quarters after the site was abandoned also caused significant destruction. In the 1970s a dam constructed by the Dongfang Hong Hydropower Plant in the lower reaches of the Muzat River running in front of the caves raised the level of the river substantially, causing further decay to the grottoes and mural paintings. Today, the caves continue to face the threat of earthquakes, flooding, erosion, excessive moisture, and cracks in the conglomerate rock. **Unfortunately, these problems have yet to be brought under effective control, and there is a realistic chance that the Kumtura caves will disappear entirely.**

A professional team was first sent by UNESCO in 1999 to inspect the Kumtura caves. A second mission undertaken in April 2000 included UNESCO, SACH, and Japanese administrators and specialists. At a subsequent meeting in Urumqi, the capital of Xinjiang province, it was decided that the UNESCO/Japan Trust Fund for the Preservation of World Cultural Heritage would allocate funding to salvage

the Kumtura caves as a cultural treasure of the Silk Road. On June 1, 2001, UNESCO and the Xinjiang government organized another meeting to assess the effects of the Dongfang Hong Hydropower Plant dam on the Kumtura caves. On-site research was conducted by Chinese and Japanese specialists from August 24 to September 2, 2001, which resulted in a plan of operations that went into effect on September 16, 2002.

Kumtura faces a number of challenges as a cultural heritage conservation project, including the area's extreme weather conditions and remote location and the complexity and severity of the damage. Aligning the various interests and demands of stakeholders under difficult circumstances was essential to ensuring effective cooperation for the long-term conservation of the site.

The immediate goals for the conservation and restoration of the Kumtura caves include undertaking urgent protective measures to prevent splitting and falling rock, further deterioration **to the mural paintings, and flood damage.** Emergency restoration work to salvage major caves was carried out from 2001 to 2004. The long-term goals of the Kumtura project include implementing sustainable management and conservation programs, improving the surrounding environment, introducing better provisions and facilities for tourists, and making the site more accessible to the general public and for specialized research.

During the first phase of the project, 2001–4, preventive conservation measures were adopted based on geological, meteorological, archaeological, and other scientific research conducted to assess the various causes of damage at the Kumtura caves and in the surrounding area (figs. 4, 5). Remedial conservation measures are planned for the second phase of work, 2005–8, and will be based on a detailed analysis of the climate, physical environment, and composition of the mural paintings. Measures will focus on strengthening the conglomerate rock, treating the peeling and fading mural paintings, and controlling excessive moisture content in the caves.

Phase 2 of the project will specifically address protecting the murals and reinforcing the fractured and shifting rock body of the five connecting caves, and reinforcing hazardous rock around caves 79 and 80. This phase will also address the hazardous rock and flood erosion that threatens the murals in caves 1 and 2. These two isolated circular dome caves were discovered in the late 1970s. Because of their secluded location, they have been protected from the kind of damage caused in the other caves by past occupants.

This conservation project was selected because it represents a characteristic heritage site that poses key technical





**FIGURE 4** Project specialists assess damage to Kumtura mural paintings.



**FIGURE 5** Project specialists assess rock damage inside a Kumtura cave.

questions and challenges. The experience gained here serves as a valuable model for the future conservation of Kumtura and other comparable sites.

### Conservation of the Longmen Grottoes

The Longmen Grottoes, located 13 kilometers south of Luoyang in Henan province, were created over a four-hundred-year period. Beginning in 494 C.E., more than 2,300 caves and small niches were carved into the Xiang and Longmen limestone cliffs along the banks of the Yi River (figs. 6, 7). The site, which includes 40 stupas and more than 3,600 stelae and 10,000 statues, was inscribed by UNESCO as a World Heritage Site in 2000. Over the past fifteen hundred

years, the Longmen Grottoes have suffered extensive damage caused by both humans and nature. Conservation work undertaken by the Chinese government began at the site in 1953 with the preliminary establishment of an administrative office. Since then, work has progressed in two stages. (1) Prior to 1971, conservation focused on preventing man-made damage to the site. Beginning in 1965, measures to enhance scientific conservation included training technical staff, constructing laboratories for testing, installing a meteorological station, and conducting a geological survey of the area. (2) From 1971 to 1985, emergency restoration work was undertaken based on an analysis of threats, atmospheric data, mapping, and seismic activity. A comprehensive



**FIGURE 6** Caves and niches of the Longmen Grottoes along the west bank of the Yi River in Henan province.



**FIGURE 7** Fengxian temple, the largest cave at the Longmen Grottoes.

management plan was finalized in 1987, and the Longmen Grottoes Research Institute was founded in 1990.

Despite early studies and conservation work, the Longmen Grottoes continue to be affected by water seeping through cracks in the rock body, erosion and damage to the exterior rock body, growth of microorganisms and lichen, deposits of soot and grime inside the caves, and other damaging factors. In response, an international cooperation initiative to protect the Longmen Grottoes began in October 2001 with support from UNESCO/Japan Funds-in-Trust.

During phase 1, from 2001 through 2005, the major factors threatening the Longmen Grottoes and their causes were determined. Work focused on research, including topographical mapping, geological surveying, and environmental monitoring inside the caves, as well as assessing erosion, water damage, and deterioration from exposure to pollutants in the environment. Three caves—Qianxi, Huangpugong, and Lu—were selected for pilot conservation studies. Computerized equipment was installed in these caves to monitor changes in the macro- and microclimate, measure the temperature inside the rock body throughout the year, and record the distribution of cracks in the rock body and shifts in their positioning. Condensation was monitored in Qianxi and Huangpugong caves.

This effort established a solid foundation for the work in phase 2, which began in May 2005. This phase, which continues through 2008, involves the actual conservation of the three pilot caves. The immediate goals are to improve the environment of the caves, install appropriate environmental monitoring equipment, and adopt a standard system of maintenance. The project's long-term goals include building sustainable management and conservation practices that maximize on the knowledge shared and experience gained throughout the process of preservation.

## Lessons Learned

UNESCO advocates that responsibility for the protection of cultural heritage should ultimately be in the hands of the nation where the heritage is located. International efforts to protect that heritage should emphasize respect for the country's culture, traditions, and ideas. A balanced exchange that capitalizes on international expertise while recognizing the capacity and interests of the host country is necessary.

A number of lessons were learned from the four international conservation projects described in this paper.

1. Using its administrative capacity to coordinate and organize, the UNESCO Office Beijing was able to effectively oversee the management and implementation of the projects in a way that facilitated communication and fostered agreement between the international specialists and the national project members. Achieving a balance of interests and mutual accord among stakeholders is often one of the biggest obstacles encountered on projects involving international cooperation and is necessary to ensure their sustainable operation.
2. Communication and understanding among all project members, including specialists, management, and other personnel, are key to a project's success. This includes exchanging ideas about cultural heritage, national values, work technique, and the materials and technology used in conservation, which vary significantly between individuals and nations.
3. Learning from and engaging local expertise play an important role in cultural heritage conservation. This was especially true for building a sustainable protection strategy for the Longmen Grottoes and the Kumtura caves. In guiding and encouraging existing conservation efforts, project staff were able to strengthen the professional capacity of local personnel and foster an independent body of management in Xi'an, in the Xinjiang Uyghur Autonomous Region, and at the Longmen Grottoes Research Institute.
4. The most advanced technology or a meticulous project design must often be compromised for more practical measures of conservation. This means taking into account the local climate, economic situation, and human resources in the creation of an operational work plan. Equipment should be selected based on function, as well as the skill level of local employees and the local environmental conditions.
5. Conservation is more than just a technical matter. The growing needs of the local population and the local economy cannot be overlooked in the interest of heritage conservation. Instead, a holistic approach is recommended, integrating the local heritage into the larger environment and adjusting to the current contending social norms, political interests, and other external forces.



# International Cooperation for the Protection of China's Cultural Heritage

Huang Kezhong

**Abstract:** *Diverse international collaborations have had a positive effect on China's efforts to preserve its cultural heritage. A number of conservation specialists have been trained and assistance has been provided in the form of technology, funding, and equipment. Successful international collaboration depends on a number of factors: a long-term strategic plan for cooperation, project leaders who can communicate effectively in a spirit of mutual trust, younger project members eager to learn and experiment, support and guarantees from the authorities in charge, and adoption of useful concepts and technologies. This paper reviews China's efforts to protect its cultural heritage through international collaborations and identifies the factors that have led to the stable, eighteen-year collaboration between the Dunhuang Academy and the Getty Conservation Institute.*

The significance and beauty of China's cultural heritage have inspired the Chinese government and conservation specialists to create effective and efficient theories and methodologies for its protection, but these are far from perfect. Consequently, China has sought assistance from other countries. Through international cooperation, the more advanced expertise developed by other countries for the protection and management of their cultural relics and sites are complementing the Chinese methodology.

Since the implementation of reforms and policies in China that opened the country to the outside world, cooperative programs have greatly benefited China. China's programs with other governments, UNESCO, community associations, and foundations, as well as with individuals, have yielded considerable benefits. These programs have included joint research projects, academic conferences,

management of archaeological sites, staff training, and the building of infrastructure and research facilities. All such efforts have helped to convey to the outside world China's aspirations to protect its cultural heritage.

## The China Principles

China's move toward international cooperation to protect its cultural heritage is defined by the *Principles for the Conservation of Heritage Sites in China* (Agnew and Demas 2004). This document, hereafter referred to as the China Principles, contains national guidelines for the conservation and management of cultural heritage sites in China. Drafting of the document was a joint effort involving three parties: China's State Administration of Cultural Heritage (SACH), the Getty Conservation Institute (GCI) in the United States, and the Australian Heritage Commission. The three parties began drafting the China Principles in 1997. In support of this effort, field studies were conducted in all three countries, and numerous working sessions were held to discuss the results of the field research. These activities made it possible to constructively revise the draft guidelines.

At the same time, the collaborative activities also provided an opportunity for countries to understand one another's different approaches to conservation. For example, with regard to the restoration of ancient buildings, some foreign experts suggested that China had done excessive refurbishing, which could damage the original material. Chinese experts, on the other hand, suggested that, as most of the ancient buildings in China were made of wood, the damage to beams, pillars, and so on had to be restored or refinished so as to avoid total collapse. To maintain the original

appearance, then, efforts should be made to maximize the similarity of the coloring, patterning, and painting. All of this is a consequence of the nature of wood, which is the mainstay of building materials in China. This kind of restoration is not, according to Chinese experts, contrary to the principle of accurately maintaining the original appearance and authenticity of the heritage architecture.

Language did not constitute a significant hindrance during discussions of the field research, and even when discussing complicated and abstract topics, Chinese scholars and their English-speaking American and Australian counterparts succeeded in reaching consensus on the many issues before them.

Many of the principles embodied in Australia's Burra Charter (Australia ICOMOS 2000), which provides guidance for the conservation and management of places of cultural significance, were incorporated in the revisions of the China Principles. For example, article 11 of the China Principles, on assessing the value of cultural heritage and the procedure for assessing significance, originates from the Burra Charter.

The China Principles are fully within the scope of the relevant laws of China. They are based on the idea that protection is the main goal and, following Chinese law, that restoration of heritage on the verge of extinction is of top priority, that reasonable use is beneficial to contemporary society, and that effective management guarantees all of these. The China Principles are, therefore, a set of academic and technical guidelines regulated by China's laws; the document states, as does Chinese law, that the contemporary values of cultural relics are threefold: historic, artistic, and scientific. Further, protection is guaranteed by an effective program characterized by strict application of techniques, and educational and tourism uses are mainly for social benefit, while economic benefits must be controlled, in order not to impair the significance of cultural heritage. In addition, when restoration or moving a site is imperative, the processes must be guided by reasonable regulations.

To ensure that the China Principles are fully effective in China's heritage preservation work, SACH organized a special panel of experts and consultants to review the drafts. The China Principles were formally issued by China ICOMOS—the national committee of the International Committee on Monuments and Sites—with the approval of SACH, in October 2000.

The China Principles have now been adopted in many parts of China as a lawlike document. For example, the recent

drafting of the master plans for both the Mogao Grottoes and for the Chengde Imperial Summer Resort and its outlying temples in Hebei province is the product of the application of the China Principles. At both sites, the participation of staff in the process was critical to the writing of the plans. Due to the China Principles, the result is more standardized in terms of scientific protection and management of cultural heritage.

The Chinese, American, and Australian participants who drafted the China Principles have different political, historical, and cultural backgrounds. The success of their cooperative work demonstrates that future collaborations are not only necessary but also feasible in the area of heritage protection (Zhang Bai 2005).

### **Successful Collaboration in Cultural Heritage Protection**

For more than fourteen years, the Dunhuang Academy and the GCI have successfully worked together to address sand migration problems, ambient and microenvironmental monitoring tasks, color monitoring and wall painting conservation, visitor capacity study and management issues, and master planning and training. Some of the key factors behind this success that may help other international collaborations are described below.

- Both parties are recognized for their accomplishments in heritage preservation and have hardworking, dedicated young staff, led by experienced, creative, and considerate professionals.
- The collaboration has focused on the most urgent issues or issues that had been greatly delayed because of technical difficulties. For example, at Mogao, both parties sought to understand the complex causes of the deterioration of the wall paintings and sculpture and to determine how wind, sand migration, moisture movement, and the gradual collapse of the cliffs were damaging the grottoes.
- Special attention was given to effective management of the teams from different countries. To avoid misunderstandings and interruptions of the collaborative work, special attention was given to the clarification of responsibilities, to overall organization, to the timely review of progress, and to coordination. For example, during phases of the

Mogao wall painting component of the project, experts from many countries were invited to assess the work. This process greatly promoted understanding, respect, and trust among the organizations and personnel concerned.

- Techniques and instrumentation for protecting cultural heritage were continually upgraded. For example, documentation methods introduced from abroad brought about breakthroughs in the treatment of the disruption of plaster and wall painting at Mogao Grottoes; this problem had puzzled Chinese experts for many years.
- Due attention was paid to the professional training of staff members. Many of the young and midcareer staff members from China were sent to the GCI for advanced study, and on their return they were given important roles in work involving international cooperation. Continued training and subsequent fieldwork helped to expand their work experience and in the long run benefited the research and conservation work of Dunhuang Academy (Fan Jinshi 2002).

### Other International Collaborations

In addition to its work with the GCI, China has entered into a number of international collaborations that have improved the country's efforts to protect its cultural heritage. Some of these successful projects are described here.

#### Chinese-German Collaborations

International cooperation to protect the cultural heritage of Shaanxi province began in 1989 when China's State Committee of Science and Technology and the German Ministry of Technology signed an agreement that established a cooperative project. Over the past sixteen years, the cooperative effort of the Archaeological Institute of Shaanxi Province and the Mainz Römisch-Germanisches Zentral Museum has resulted in the establishment of a modern conservation laboratory and the conservation of a Tang dynasty (618–907 C.E.) underground palace in Famensi, as well as computer data collection and mapping of the Tang dynasty royal tombs, which laid the foundation for future examination and protection of the tombs.

In 2001 the two parties signed another agreement establishing an ancient silk and mural painting restoration

laboratory at the Xian Archaeology Research Institute. The laboratory has successfully conserved wall paintings from the Eastern Han dynasty (25–220 C.E.) and silk remnants found in Famensi, six of which have been displayed at exhibitions. The Bavarian State Conservation Office also collaborated with the Museum of the Terracotta Warriors and Horses and the Cultural Relics Conservation Center of Xi'an in the conservation of color paintings from the Qin and Han dynasties (221 B.C.E.–220 C.E.) and of painted sculptures in the Grand Buddha Temple of Bin Xian county. They also worked together to develop a magnetic mapping device used in archaeology.

#### Chinese-Japanese Collaboration

With financial support from the Japan Funds-in-Trust for the Preservation of the World Cultural Heritage, UNESCO organized a joint project to preserve the Thousand Buddha Grottoes in Kumtura in Xinjiang Uyghur Autonomous Region. In 2001 the Cultural Relics Bureau of Xinjiang and the Beijing office of UNESCO successfully undertook the first phase of the project: mapping and geologic survey of the site. With the collaboration of experts from China and Japan and with modern instruments, techniques, and documentation methods imported for this project, the preparation work was highly successful, and the data acquired jointly by the international team laid a solid foundation on which to continue this effort.

#### Learning from Failure

There is no denying that some collaborative projects ended in failure, but here too lessons can be learned. The reasons for failure were many; for example, some projects were too ambitious and impracticable; misunderstanding and even suspicion arose as a result of the language barrier; a lack of timely coordination resulted in the cessation of some projects; excessive focus was placed on funding and equipment and not on staff training, resulting in wasted money and the misuse of high-technology instrumentation; some projects were undermined by personal gain (for example, one party was concerned solely with acquiring information and the other party with acquiring equipment funding); disagreements in methodology and theories arose when they were not reconciled by prior negotiation or when one party's ideas were imposed on the other; and a lack of mutual respect made reconciliation and negotiation impossible.

## Protecting China's Cultural Heritage: The Next Steps

The successes of previous collaborations on the protection of China's cultural heritage have stimulated interest in seeking further cooperation. Increasing support for this work, both moral and financial, from the Chinese government and the public is attracting greater attention from overseas. Summarized below are suggestions for maximizing future international collaborations.

*Prioritize needs.* Chinese authorities should concern themselves with issues of highest priority, for example, professional training, management experience, specification and standards establishment, and restoration technology. In terms of conservation challenges, emphasis should be placed on stabilization of earthen archaeological sites, preservation of wall paintings in underground tombs, prevention of decay and termite infestation in wooden constructions, and cleaning and stabilization of textiles, as well as calligraphic and painted scrolls. Further, it is advisable that imported advanced technologies be combined with traditional Chinese craftsmanship so as to maximize the benefits of both.

*Publicize and educate.* Efforts must be made to make the Chinese public aware of the importance of heritage conservation and encourage their participation. In addition, specialized education should be offered to people who are engaged in the work.

*Use foreign expertise to its fullest.* Much of the advanced equipment and technology and management techniques and experience acquired from overseas are used only sparingly in China and not to their full potential.

*Engage upper management.* International exchanges among people at the highest levels of management are equally important. These are the people who are responsible for policy making.

*Learn from other countries.* In the field of cultural heritage conservation, every country has a unique perspective. In Australia and the United States, for example, the concept of cultural heritage is broad. It means not only physical materials, sites, and artifacts but also a way of life, particularly in traditional relationships between humans and nature, as in native communities. At some archaeological sites, visitors include local residents, as well as tourists. In France, the concept of heritage is also broad: manufac-

turing mills that are only a century old and even buildings constructed in the twentieth century, if they are unique, are objects of protection. The Italian government draws funds for heritage protection from various channels. For instance, 0.8 percent of the country's lottery revenue is allotted to heritage protection, and a large percentage of tax revenue is also used for the same purpose. In Mexico, the National Institute of Anthropology and History is responsible for all heritage protection and has the authority to implement policies. Three binding principles are in operation in Mexico's heritage protection work: (1) heritage protection is closely related to the elimination of poverty; for example, local people are employed in heritage conservation institutions so they may earn a living without leaving their homes; (2) the protection of heritage is closely related to its reasonable use, and tourism promotes international recognition of the country's history; and (3) the government's endeavors in conservation are complemented by the efforts of volunteer organizations and private foundations. Conversely, Chinese policies, practices, and theories in heritage protection offer new insight to others.

*Expand exchange topics.* Exchanges are necessary in such areas as the relationship between urbanization and cultural heritage protection, the relationship between tourism and cultural heritage protection, and the preservation of whole cities or towns with historic and cultural values.

## Conclusion

China is fully committed to preserving and safeguarding its cultural heritage. Two important conferences were recently held in China: the twenty-eighth annual conference of the World Heritage Committee and the fifteenth General Assembly of ICOMOS (2005). This demonstrates that the Chinese government is making a great effort to encourage international cooperation at a high level and that China is entering the international arena of heritage conservation by courageously shouldering its share of the responsibility as regulated by international conventions and agreements. We hope that the efforts and contributions of the Chinese people will allow the world to realize the beauty and importance of heritage in China and the need for its protection and conservation.

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# Deterioration and Treatment of Wall Paintings in Grottoes along the Silk Road in China and Related Conservation Efforts

Li Zuixiong

**Abstract:** *Several hundred grottoes of different sizes still remain along the Silk Road in northwestern China. The main cultural relics at those sites are splendid wall paintings and polychrome sculptures. The conservation activities that have been undertaken include studies of the overall environments of the grottoes, engineering geology surveys, rock and mineral analyses, and monitoring of the caves' micro- and macroenvironments. In addition, research has been conducted on the plaster materials used in the wall paintings and their manufacturing techniques, the pigments, and the binding media for the pigments. Assessments and analyses of wall painting deterioration were also conducted. This paper describes the components and materials of the wall paintings in several geographically widely separated grotto sites, the different forms of deterioration that affect the wall paintings, and efforts to conserve salt-disrupted and detached wall paintings.*

Many grotto sites survive along the Silk Road in northwestern China. Most of them are located in arid and semiarid areas with high annual sunshine and evaporation rates, a great temperature difference between day and night, and frequent wind and dust storms. Most cliffs into which these grottoes were excavated consist of sandstone and conglomerate with argillite cement containing clay minerals such as montmorillonite. These materials make the cliffs susceptible to water penetration. The rock is porous and loose and has poor mechanical strength (Li Zuixiong 2003).

## Components of Wall Paintings in Selected Chinese Grottoes

### Plaster Preparation

The materials and techniques used to make the grotto wall paintings are similar at all sites along the Silk Road in China. There are only slight regional variations and differences in construction. After the rock surface of the excavated cave was completed, layers of mud plaster were applied. Generally, there were three layers: coarse plaster, fine plaster, and a final ground layer. The clay and fibers used to make the coarse and fine plaster layers were usually obtained locally.

The characteristics of plaster analyzed from wall paintings in the Kizil, Kumtura, and Bezeklik Grottoes in Xinjiang are shown in table 1, in the Mogao Grottoes in table 2, and in the Bingling Grottoes in Gansu province in table 3. These analyses show that the coarse plaster layer was made of clay mixed with sand and straw, but the straw used varied from site to site. Thicker wheat straw was mixed in the plaster of the Kizil, Kumtura, and Bezeklik Grottoes, while thinner wheat straw was used in the plaster of the Mogao and Bingling Grottoes. The fine plaster layer was made of fine clay and sand tempered with hemp, cotton, or wool. This layer was mainly mixed with wool in the Kizil, Kumtura, and Bezeklik Grottoes; with hemp in the Mogao Grottoes; and with cotton in the Bingling Grottoes. The plaster ground, which may contain binding medium, is primarily gypsum and lime in the Kizil, Kumtura, and Bezeklik Grottoes; primarily gypsum, lime, and kaolin in the Mogao Grottoes; and primarily gypsum in the Bingling Grottoes.

Table 1 Characteristics of Plaster from the Kizil, Kumtura, and Bezeklik Grottoes, Xinjiang Autonomous Region

Grotto	Cave No.	Time Period	Sample Location	Plaster Thickness (cm)			Fiber Content		Soil (%)	Sand (%)
				Coarse	Fine	Ground Layer	Coarse	Fine		
Kizil	48	4th century	Main chamber	0.5-2.0	0.2	0.01	straw	hemp	57	43
	48	4th century	West wall of corridor at bottom	0.5-2.0	0.2	0.01	straw	hemp	37	63
	77	6th century	East wall of western corridor	0.5		0.01	straw	straw	34	66
	47	4th century	Wall painting fragment			0.01	straw	wool	49	51
	38	4th century	Wall painting fragment	1.5-2.0		0.01	straw	wool	44	56
	179	7th century	East wall of main chamber	2.0		0.02	straw	hemp	42	58
	34	5th century	West wall	1.0	0.5	0.02	straw	hemp	31	69
	58	7th century	West wall of main chamber	2.0	0.5	0.02	none	hemp	55	45
	186	7th century	North wall of main chamber	1.0	0.3	0.02	straw	hemp	39	61
	180	8th century	Wall painting fragment	3.0	0.2-0.5	0.02	straw	hemp	76	24
Kumtura	178	7th century	Bottom of west wall	3.0	0.5	0.02	straw	hemp	33	67
	27	7th century	Entry to west corridor	3.0	0.2	0.02	straw	hemp	52	48
	10	8th century	Wall painting fragment				straw	wool	71	29
	16	8th century	Wall painting fragment				hemp	hemp	68	32
	28	7th century	Wall painting fragment	1.0	0.5		straw	wool	71	29
	37	7th century	Fragment of polychromed statue	2.0-3.0	0.5		straw	hemp	72	28
	18	Sui dynasty (581-618)	Wall painting fragment	4.0-5.0	0.2	0.02	straw	hemp	48	52
	28	Five Dynasties (907-79)	Wall painting fragment	2.0	0.3	0.02	straw	hemp	34	66
Bezeklik	40	14th century	Wall painting fragment	3.0	0.3	0.02	straw	hemp	50	50

**Table 2** Characteristics of Plaster from the Mogao Grottoes, Dunhuang

Cave No.	Dynasty	Sample Location	Plaster Thickness (cm)			Fiber Content		Soil (%)	Sand (%)
			Coarse	Fine	Ground Layer	Coarse	Fine		
268	Late Western Jin to end of Southern and Northern dynasties	Bottom of west wall	3.0	0.3–0.4	0.01	straw	hemp	59	41
275	Late Western Jin to end of Southern and Northern dynasties	Bottom of north wall	3.0	0.1–0.2	0.01	straw	hemp	56	44
263	Late Western Jin to end of Southern and Northern dynasties	Middle of south wall	1.5–2.0	0.5	0.01	straw	straw	49	51
259	Northern Wei	North side of west wall	3.0	0.2–0.3	0.01	straw	hemp	55	45
260	Northern Wei	Bottom of west wall	2.0	0.5	0.01	straw	hemp	40	60
249	Western Wei	Bottom of north wall	3.0–4.0	0.3	0.01	straw	hemp	65	35
285	Western Wei	Bottom of east side of south wall	3.0	0.3	0.01	straw	straw	46	54
288	Western Wei	Fragment of wall painting	2.0–2.5	0.3	0.01	straw	hemp	45	55
290	Western Zhou	North side of east wall	2.0–3.0	0.2	0.01	straw	hemp	73	27
56	Sui	Bottom of niche in west wall	2.0–3.0	0.5–1.0	0.02	hemp	hemp	80	20
302	Sui	Bottom of south wall	2.0–3.0	0.5	0.02	straw	hemp	82	18
283	Early Tang	Bottom of north wall	2.0–3.0	0.5	0.02	straw	none	60	40
60	Early Tang	Bottom of niche in west wall	2.0–3.0	0.5	0.02	straw	none	53	47
68	Early Tang	Bottom of south wall of niche	2.0–3.0	0.5	0.02	straw	hemp	41	59
79	High Tang	West side of south wall of antechamber	2.0–3.0	0.5–1.0	0.02	straw	hemp	61	39
172	High Tang	South side of west wall of antechamber	3.0	1.0	0.02	straw	hemp	40	60
48	High Tang	North wall of main chamber	3.0	0.5–1.0	0.02	straw	straw	62	38
197	Mid Tang	Bottom of niche in main chamber	3.0–4.0	0.2	0.02	straw	straw	41	59
231	Mid Tang	Bottom of southwest corner of main chamber	3.0–4.0	0.5–1.0	0.02	straw	hemp	34	66
236	Mid Tang	Bottom of niche in main chamber	1.0–2.0	0.5	0.02	straw	hemp	50	50
107	Late Tang	Bottom of northeast corner of main chamber	2.0	0.5–1.0	0.02	straw	hemp	20	80
82	Late Tang	Bottom of niche	2.0–2.5	0.5	0.02	straw	hemp	33	67
9	Late Tang	East side of central column	2.0–3.0	0.15–0.2	0.02	straw	hemp	35	65
334	Five Dynasties	North wall of main chamber corridor	2.0–3.0	0.4	0.02	hemp	hemp	46	54
5	Five Dynasties	Bottom of north side of west wall	1.0–1.5	0.3	0.02	straw	hemp	58	42
40	Five Dynasties	Bottom of south wall	2.0–3.0	0.5	0.02	none	hemp	27	73
365	Song	Fragment of wall painting	1.0–1.5	0.5	0.02	straw	hemp	34	66
25	Song	Southern wall of corridor	2.0	0.5–1.0	0.02	straw	hemp	50	50
378	Song	Bottom of north side of east wall	2.0–3.0	1.0	0.02	straw	hemp	45	55
367	Western Xia	Bottom of north wall	1.5–3.0	0.3–0.4	0.02	straw	hemp	46	54
352	Western Xia	Bottom of north wall	2.0	0.5	0.02	hemp	hemp	48	52
477	Yuan	Top of north wall of corridor	2.0	0.5	0.02	straw	hemp	14	86
465	Yuan	Bottom of south side of east wall	2.0–3.0	0.5	0.02	straw	hemp	36	64

**Table 3** Characteristics of Plaster from the Bingling Temple Grottoes, Yongjing

Cave No.	Dynasty	Sample Location	Plaster Thickness (cm)			Fiber Content		Soil (%)	Sand (%)
			Coarse	Fine	Ground Layer	Coarse	Fine		
169	Western Qin	Fragment of wall painting	1.5–2.0	0.5–1.0	0.01	none	none	33	67
6	Northern Zhou	Fragment of wall painting	2.0	0.5	0.01	hemp	hemp	44	56
172	—	Fragment of wall painting	2.0	0.5–1.0	0.01	straw	cotton and hemp	77	23
70	Ming	Fragment of wall painting	2.0–3.0	0.5	0.02	straw	hemp	41	59
2	Ming	Fragment of wall painting	2.0	0.5	0.02	straw	cotton	51	49
2	Ming	Fragment of wall painting	2.0	0.5	0.02	straw	cotton	62	38
2	Ming	Fragment of wall painting	2.0	0.5	0.02	straw	cotton	49	51
5	Ming	Fragment of wall painting	2.0	1.0	0.02	straw	cotton	34	66
3	Ming	Fragment of wall painting	2.0	0.3	0.02	straw	cotton	49	51
4	Ming	Fragment of wall painting	3.0	1.0	0.02	straw	cotton	41	59

### Pigments

Results from X-ray diffraction analysis of pigments from the Kizil Grottoes are shown in table 4, from the Mogao Grottoes in table 5, and from the Maijishan Grottoes in table 6.

The Kizil Grottoes are the earliest representative grottoes in China. Kizil wall painting colors are reds, primarily vermilion and red lead, which have mostly discolored, and red ocher; the blues are lapis lazuli; the greens are copper hydroxy chloride minerals such as atacamite; the brownish black is  $\text{PbO}_2$ , which is produced by the oxidation of red lead; and the whites are mainly gypsum.

At the Mogao Grottoes, red ocher was the primary pigment used in the early-period caves, while vermilion and red clay, which have discolored or faded, were extensively used in the mid- and late-period caves, respectively. Blue is primarily azurite, with lapis lazuli used to a lesser extent. Green is atacamite, the primary pigment used in early- and late-period caves, while malachite was used in mid-period caves. The primary brownish black pigment is  $\text{PbO}_2$ . Whites were mainly kaolin, calcite, and gypsum.

The red pigments used in wall paintings at the Maijishan Grottoes are primarily vermilion and red clay, blue is mainly lapis lazuli, and green is malachite, with atacamite used to a lesser extent. The primary brownish black pigment is  $\text{PbO}_2$ . Whites are mainly gypsum, with calcite used to a lesser extent.

The analytical results described above show that the pigments used at the Mogao and Maijishan Grottoes are

similar, but they differ significantly from those used at the Kizil Grottoes.

### Binding Medium

High-performance liquid chromatography was used to analyze the binder in the wall paintings at the Mogao and Kizil Grottoes (Li Shi 1992). The results show that the binder is animal glue, probably made from ox hide (Guo Hong, Li Zuixiong, Song Dakang, et al. 1998).

### Deterioration of Wall Paintings

Deterioration of the wall paintings includes plaster disruption, paint flaking, detachment, discoloration, and fading. The wall paintings are also affected by mold and soot.

### Plaster Disruption

The preparatory plaster layers applied to the cave walls are highly susceptible to salt deterioration. Salts in or absorbed by the plaster will be moved by moisture and deposited below and on the surface of the wall paintings. If humidity reaches certain levels, salts will deliquesce and the plaster swell. On redrying, the dissolved salts recrystallize, and repeated cycles of salt lead to disruption of the plaster and paint layers (Guo Hong, Li Zuixiong, Song Dakang, et al. 1998; Guo Hong, Li Zuixiong, Qiu Yuanxun, et al. 1998) (figs. 1, 2).

**Table 4** Analysis of Pigments from Kizil Grottoes, Xinjiang Autonomous Region

Time Period	Cave No.	Pigment Analysis by X-Ray Diffraction				
		Red	Blue	Green	Brownish Black	White
6th century	77	Red ocher		Copper hydroxy chloride*	PbO <sub>2</sub>	Gypsum + calcite
4th century	38	Red ocher	Lapis lazuli	Copper hydroxy chloride	PbO <sub>2</sub>	Gypsum + anhydrite
4th century	114	Vermilion	Lapis lazuli	Copper hydroxy chloride	PbO <sub>2</sub>	
8th century	180	Vermilion + red ocher	Lapis lazuli			
7th century	100			Copper hydroxy chloride	PbO <sub>2</sub>	Gypsum + quartz + calcite + anhydrite
7th century	179		Lapis lazuli	Copper hydroxy chloride	PbO <sub>2</sub>	
5th century	171	Vermilion, red lead + PbO <sub>2</sub>	Lapis lazuli		PbO <sub>2</sub>	
7th century	New No. 1	Vermilion, vermilion + red ocher, red lead	Lapis lazuli	Copper hydroxy chloride	PbO <sub>2</sub>	Gypsum + calcite
7th century	186	Red lead + PbO <sub>2</sub>	Lapis lazuli	Copper hydroxy chloride	PbO <sub>2</sub>	Gypsum + anhydrite + calcite
7th century	135	Red ocher				Calcite + gypsum

\*Cu<sup>2+</sup>(OH)<sub>3</sub>Cl.**FIGURE 1** Plaster disruption of wall painting in cave 26, Mogao Grottoes, Dunhuang.**FIGURE 2** Blistering and disruption of wall painting in cave 35, Mogao Grottoes, Dunhuang.



**Table 5 Analysis of Pigments from the Mogao Grottoes, Dunhuang**

Time Period	Dynasty	Pigment Analysis by X-Ray Diffraction				
		Red	Blue	Green	Brownish Black	White
Early period	Sixteen Kingdoms, Northern Wei, Western Wei, and Northern Zhou	<i>Primary:</i> Red ocher	<i>Primary:</i> Lapis lazuli	<i>Primary:</i> Copper hydroxy chloride	<i>Primary:</i> PbO <sub>2</sub>	<i>Primary:</i> Kaolin
		<i>Secondary:</i> Vermilion, vermilion + red lead, red ocher + red lead	<i>Secondary:</i> Small amount of azurite	<i>Secondary:</i> Small amount of malachite	<i>Secondary:</i> PbO <sub>2</sub> + Pb <sub>3</sub> O <sub>4</sub>	<i>Secondary:</i> Talc, small amount of calcite, mica, and gypsum
Middle period	Sui, Early Tang, High Tang, Middle Tang, and Late Tang	<i>Primary:</i> Vermilion	<i>Primary:</i> Azurite + lapis lazuli	<i>Primary:</i> Malachite <i>Secondary:</i> Small amount of copper hydroxy chloride, malachite + copper hydroxy chloride	<i>Primary:</i> PbO <sub>2</sub> <i>Secondary:</i> Trace of PbO <sub>2</sub> + Pb <sub>3</sub> O <sub>4</sub>	<i>Primary:</i> Calcite <i>Secondary:</i> Talc, kaolinite, mica, gypsum, small amount of chlorine, lead, and anglesite
		<i>Secondary:</i> Red lead, red clay, vermilion + red lead, red clay + red lead	<i>Secondary:</i> Small amount of azurite + copper hydroxy chloride			
Late period	Five Dynasties, Song, Western Xia, Yuan, and Qing	<i>Primary:</i> Red clay	<i>Primary:</i> Lapis lazuli, azurite, and ultramarine	<i>Primary:</i> Copper hydroxy chloride <i>Secondary:</i> Malachite + copper hydroxy chloride	<i>Primary:</i> PbO <sub>2</sub> <i>Secondary:</i> Small amount of PbO <sub>2</sub> + Pb <sub>3</sub> O <sub>4</sub> , trace of Fe <sub>3</sub> O <sub>4</sub>	<i>Primary:</i> Gypsum <i>Secondary:</i> Calcite, small amount of talc, mica, chloride, lead, and Mg <sub>3</sub> Ca(SO <sub>4</sub> ) <sub>4</sub>
		<i>Secondary:</i> Red clay + red lead, vermilion + red lead, trace of realgar + red lead	<i>Secondary:</i> Small amount of azurite + malachite			

**Table 6 Analysis of Pigments from the Maijishan Grottoes, Tianshui**

Dynasty	Cave No.	Pigment Analysis by X-Ray Diffraction				
		Red	Blue	Green	Brownish Black	White
Northern Wei	70	Vermilion	Lapis lazuli	Malachite	PbO <sub>2</sub>	Talc + gypsum + calcite
	74	Vermilion	Lapis lazuli	Malachite	Fe <sub>3</sub> O <sub>4</sub>	Gypsum
	127	Vermilion	Lapis lazuli			Calcite
Northern Wei (rebuilt during Song)	93	Red clay			PbO <sub>2</sub>	Gypsum + mica
Western Wei	44	Red clay		Malachite	PbO <sub>2</sub>	Talc + gypsum
Northern Zhou	94	Red clay	Lapis lazuli	Malachite	PbO <sub>2</sub>	Gypsum + calcite
Sui	37	Red clay		Malachite		Gypsum
Yuan	127			Copper hydroxy chloride	PbO <sub>2</sub>	
Ming	9	Red clay		Copper hydroxy chloride		Anhydrite + gypsum

**FIGURE 3** Flaking paint layer of wall painting in cave 428, Mogao Grottoes, Dunhuang.



### Flaking

A number of conditions reduce adhesion of the paint layer to the plaster ground, causing the paint to lift and peel in flakes (fig. 3). These include the following:

- too much binding medium was used in the paint;
- the binding medium has not entirely deteriorated, but any glue in the ground layer has aged, or less glue was used in the ground layer;
- the plaster ground has been deteriorated by salts; or
- the surface of the plaster was made so hard and smooth that the paint layer could not attach properly to it.

The lifting and peeling of the paint and ground layers from the fine clay layer of the plaster is caused primarily by soluble salts, which affect the cohesion of the clay (fig. 4).



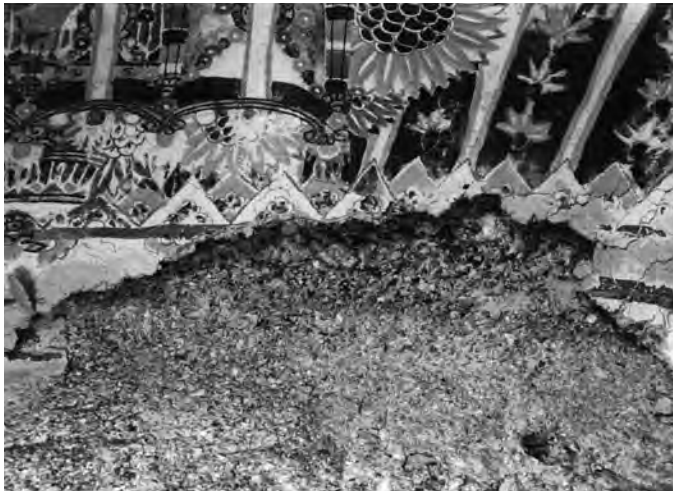
**FIGURE 4** Plaster detachment of wall painting in cave 6, Yulin Grottoes, Dunhuang.

At the Mogao Grottoes some wall paintings were over-painted in subsequent dynasties, and this has also led to flaking. In these cases, a new ground layer was spread over a wall painting and the added ground then painted with a new scene. These new paintings tended to flake, however, either because the glue used in the original wall painting had aged or because the surface was already disrupted.

### Detachment of the Plaster Layer and the Paint Layer

The primary reason for the detachment or separation of the plaster from the cave rock is that the rock surface was too weathered when it was originally plastered and painted. At the Mogao and Yulin Grottoes and the Western Thousand Buddha Caves, the cliffs are composed of weak, poorly cemented conglomerate. Because of this, the plaster layer easily detaches from the rock during earthquakes and may fall immediately or at a subsequent time. Also, water easily penetrates the conglomerate, wetting the plaster and causing large areas of detachment between the rock surface and the plaster (fig. 5). Many roof paintings in the upper-level caves have already fallen, due to rainwater penetration. This is seen especially at the Yulin Grottoes. In addition, sand and pebbles from the weathered cliff frequently have accumulated in the detached areas between the plaster and rock surface. This sand and pebble buildup pushes out on the plaster and contributes to loss.

A special situation exists at the Mogao Grottoes. Many of these caves are narrower at the upper part and wider



**FIGURE 5** Large area of plaster loss in wall painting in cave 368, Mogao Grottoes, Dunhuang.

at the base; hence the walls incline inward slightly. This puts additional gravitational strain on the plaster, which is often heavy, having been applied thickly to cover the uneven, coarse-grained rock surface of the side walls, or does not adhere well to the wall because of the coarse and loose rock surface. Thus the inclination of the side walls puts additional strain on the already at-risk plaster, and the plaster with wall paintings in these caves easily collapses when disturbed by earthquakes or other types of vibration.

### Discoloration and Fading

The pigments used in the Mogao murals were made from minerals. There are two reasons for color fading. One is that the mineral pigments have weathered or lost water from their crystalline structure, so chroma and brightness are reduced. The other is that the organic binding media used with the pigments have aged (Li Zuixiong 1992; Michalski and Li Zuixiong 1989; Su Bomin, Hu Zhide, and Li Zuixiong 1996; Li Tiezhao and Xiang Xiaomei 1993; Sheng Fenling, Li Zuixiong, and Fan Zaixuan 1990).

Experiments on pigment samples from the Mogao Grottoes, carried out by the Dunhuang Academy, contribute to an understanding of the discoloration and fading seen in the wall paintings (fig. 6). The three red pigments primarily used in the Mogao wall paintings are vermilion, red ochre (also called red iron oxide), and red lead. Experimental results show that by itself red ochre is the most stable of these pigments, and it does not change regardless of conditions, from high humidity (90% RH) to extreme dryness (0–48% RH), nor is it affected by light. However, the binding materials that were used with the red ochre have aged over the centuries, causing the paint to powder and the color to fade through loss of pigment.

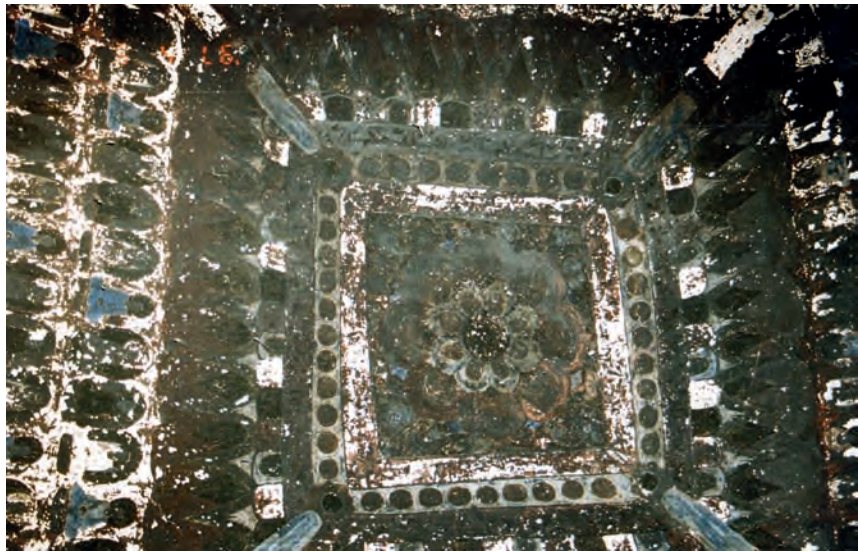
The experiments also showed that humidity does not cause fading of vermilion, made from the mineral cinnabar (mercuric sulfide). However, with long exposure to light, the vermilion turns black because some of the pigment's crystals change into the black form of cinnabar.



**FIGURE 6** Pigment discoloration and fading in wall painting in cave 205, Mogao Grottoes, Dunhuang.



**FIGURE 7** Soot deposits on ceiling wall painting in cave 56, Mogao Grottoes, Dunhuang.



Experiments also demonstrate that red lead changes very quickly under high humidity (90% RH) and when illuminated by fluorescent light. This explains why the red lead in the wall paintings has been oxidized into brownish black  $PbO_2$ . However, red lead is light stable under dry (0–48% RH) conditions. Further experiments show that red lead fades markedly under the alkaline conditions of the clay plaster and when the relative humidity reaches 70 percent. The same experiments showed that the green pigments (malachite, copper hydroxy chloride or atacamite) and the blue pigments (azurite, lapis lazuli) used in the Mogao Grottoes are relatively stable.

These studies provide scientific data that can be used to help prevent wall paintings from further discoloration and pigment loss, as well as to establish safe illumination levels in the caves.

### Soot

Some caves at the Mogao Grottoes were occupied by Russians in the 1920s, after the Russian Revolution. They made fires to keep warm and to cook, causing heavy soot deposits on the wall paintings. Some soot has also resulted from burning incense, presumably from past religious ceremonies (fig. 7).

### Conservation of the Chinese Wall Paintings

Since the founding of the Dunhuang Academy in the early 1940s, a procedure for the treatment of deteriorating wall paintings has been developed. This procedure is described

briefly below. The collaborative project between the Dunhuang Academy and the Getty Conservation Institute for the conservation of cave 85 has resulted in many innovations or modifications, as described elsewhere in this volume.

### Flaking

Five steps have been taken to conserve flaking wall paintings:

1. Dust removal: A broad brush with soft wool or an air puffer is used to gently clean dust from the surface.
2. Adhesive injection: A syringe is used to slowly inject a concentration of 2.5 to 3 percent of blended adhesive (polyvinylacetate aqueous emulsion with added polyvinyl alcohol) into the lower part of the flaking paint layer or into cracks. The syringe is inserted into a small hole made in an unimportant part of the mural or under the larger paint flakes. If there is no crack, then an injection hole is made in an unimportant area of wall painting or in the area where large flakes are located.
3. Pressure application to treated areas: A cotton ball made of absorbent cotton fiber wrapped in white silk is used to apply pressure to the treated areas of the mural to re-lay lifting flakes.
4. Adhesive spray: Adhesive is sprayed over the treated area. There are two purposes for this step: to reinforce the paint layer, especially in cases where the painting has not yet flaked, and to repair paint that has detached from the plaster layer but without

flaking, which cannot be seen. The paint layers may quickly blister after being sprayed with adhesive. In this case, adhesive is injected into a small hole made in an unimportant area of the painting as in step 2.

5. Surface rolling after adhesive spraying: After the adhesive-treated surface of the mural has dried to about 70 percent, it is covered with white silk and pressed with a soft rubber roller. Care is taken to apply pressure evenly to prevent roller marks on the painting or to prevent the treated paint layer from sticking to the white silk. The roller should not be used when the sprayed area is more than 80 percent dry, or the painting will be damaged due to the pressure as the adhesive becomes sticky.

### Detachment

Detachment of the full thickness of the plaster from the conglomerate is the most difficult form of deterioration to treat. In order to do so, we must first deal with moisture in the cave's environment, after which appropriate repair materials and techniques are used to secure the paintings in situ.

Grouting is the primary treatment method for conserving detached wall paintings. Mechanical anchor rods in the rock have also served as an auxiliary technique to pin areas of detached wall painting. The grouting process is as follows:

1. Boring of grouting holes: Several grouting holes, 0.5 to 1.0 centimeter in diameter, are bored into unimportant parts of the detached murals, proceeding from bottom to top. Then a flexible rubber tube, for delivery of the grout, 20 centimeters long and nearly the same diameter as the hole, is inserted into each hole.
2. Application of wooden wall press: A wooden press covered with a cotton blanket and soft paper as the liner is pressed against the area of the wall painting to secure the area being treated.
3. Grouting: Using slight pressure, liquid aqueous grouting liquid is inserted with a syringe through the rubber tubes into the holes that have been bored through the detached areas of the wall painting. This step proceeds from bottom to top; as holes are filled, the rubber hose is immediately stoppered, then the next upper hole is grouted, and so on.
4. Reattachment: The grouting tubes, which were stoppered when the wall painting was reattached, are unstoppered, so that the superfluous liquid can

extrude from the pipes when pressure is applied to the board using a screw or jack to re-adhere the wall paintings.

5. Press removal: When the grout is 70 percent solidified, the wooden press is removed, and the rubber grouting tubes are cut off. After the grout has completely solidified, the grouting holes are filled with the same materials as in the original plaster, so that the restored wall surface looks like the original.

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# Safeguarding Silk Road Sites in Central Asia

*Laurent Lévi-Strauss and Roland Lin*

**Abstract:** *Since the mid-1990s UNESCO has been working to safeguard cultural sites along the Silk Road of central Asia and in China. This work is possible thanks to the generosity of the Japanese government, which in 1993 set up the UNESCO/Japanese Funds-in-Trust for the Preservation of the World Cultural Heritage. This paper reviews four projects supported by the trust to safeguard sites in Kazakhstan, Kyrgyzstan, Uzbekistan, and Tajikistan. These important archaeological sites further our understanding of the Silk Road's history, economics, and social organization.*

Since the mid-1990s UNESCO has been working to safeguard cultural sites such as Buddhist grottoes along the Silk Road of central Asia and in China. This work is possible thanks to the generosity of the Japanese government, which in 1993 set up a special trust fund at UNESCO to aid the organization in its efforts to preserve and promote the cultural heritage of the world. As of 2004, Japan's total contribution to the fund for the Silk Road sites of central Asia and in China has amounted to approximately U.S.\$5 million. This paper reviews four projects being carried out in Kazakhstan, Kyrgyzstan, Uzbekistan, and Tajikistan under the UNESCO/Japanese Funds-in-Trust for the Preservation of the World Cultural Heritage.

## **Otrar, Kazakhstan**

The first project supported under the UNESCO/Japanese Funds-in-Trust program is the conservation and restoration of ruins at the Otrar Oasis (fig. 1). Covering 200 square kilometers at the confluence of the Arys and Syr Darya Rivers in southern Kazakhstan, the Otrar Oasis consists of a largely

uninhabited and unspoiled landscape containing the ruins of six medieval towns, along with an extensive system of irrigation canals dating back two thousand years (Baipakov 1991: 66–71).

The towns, the largest and most important of which is Otrar, were first excavated in 1969 by the Kazakh archaeologist Karl Baipakov and other Russian archaeologists, revealing the spectacular mud-brick structures of these large, typically central Asian settlements, which comprise a central citadel, a town area, suburbs, and earthen fortifications. It is possible to reconstruct the complex history of the region by studying these sites as they flourished over a long period, typically from the first to the fifteenth century C.E. (Jansen et al. 2003).



**FIGURE 1** Aerial view of the Otrar Oasis. © UNESCO/Japan Trust Fund Otrar Project in Kazakhstan



**FIGURE 2** Ruins of the Otrar mosque (fourteenth–fifteenth century). © UNESCO/Japan Trust Fund Otrar Project in Kazakhstan

The excavated ruins at the Otrar Oasis had been left open to the elements and were in danger of rapid erosion and deterioration. The UNESCO project aims to conserve the ancient town, or *tobe*, of Otrar and to preserve it for future generations. *Tobe* literally means “hill” or “mound” and refers to the small knolls on which the towns were originally built. Emergency conservation measures are also being carried out at the other *tobes* at the oasis. These emergency measures include cleaning, painting, repairing cracked bricks, supporting destabilized parts of the brickwork, backfilling, and erecting protective shelters and temporary fencing. Laboratory tests have been conducted on building materials and soil samples, and the results have been used to develop and test mixtures and techniques for conserving the mud bricks used in construction.

The Otrar conservation project was approved in May 2001, and the plan of operations was signed by UNESCO and the Kazakh authorities during an official visit to Kazakhstan by the UNESCO director-general in August 2001. The work is expected to be completed in June 2006.

The UNESCO project, which also includes a major research and documentation component, encourages the development of skills and expertise of Kazakh and central Asian professionals in the field of cultural heritage conservation, notably through the conservation of Otrar’s mud-brick architecture and earthen structures (Fodde and Hurd 2004), such as its mosque (fig. 2). Furthermore, since structures similar to those at Otrar exist across central Asia and their proper conservation and safeguarding present certain technical challenges, the project emphasizes the sharing of

expertise between international specialists and those from central Asia. In this way, the project builds central Asian capacity in conservation and serves as a model for others in the region (Childe 2000). The UNESCO project at Otrar is concerned not only with conserving the site but also with enabling national and regional experts and institutions to take responsibility for site conservation and management. Because of this approach, UNESCO project consultants have provided only modest, supervisory expertise (Childe 2000). For example, UNESCO consultants organized a workshop on advanced restoration techniques and held training field trips to teach about earthen materials used in construction and how to test them. The philosophy of conservation was also addressed, as was the use of computer design techniques applied to conservation documentation. The actual physical conservation of the site is being undertaken by the Kazakh experts.

An immediate and gratifying result of this project has been increased awareness regionally and nationally of the value of the cultural heritage represented by Otrar. The project has received extensive media coverage, including a thirty-minute documentary broadcast twice in December 2004 on Kazakh television. In addition, the number of visitors to the site has increased sharply—from 9,749 in 1999 to 92,397 in 2002—which the director of the Otrar Museum attributes primarily to the large numbers of visiting school-children. Increased visitation, according to the director, is one of the greatest impacts of the Otrar project thus far (Jansen et al. 2003).

### Chui River Valley, Kyrgyzstan

A second UNESCO project, begun in October 2003 and expected to be completed by 2007, aims to preserve selected Silk Road sites in the Chui River valley in northern Kyrgyzstan,<sup>1</sup> located between the capital, Bishkek, and Lake Issyk-Kul.<sup>2</sup> At one time this area was one of the region’s most important political, economic, and military centers, thanks to its position on the Silk Road. The valley’s ancient towns of Navikat (now Krasnaya Rechka), Suyab (now Ak Beshim), and Balasagyn (now Burana) were founded during the sixth century C.E. and later developed into centers where a symbiosis of Indian, Chinese, Sogdian, and Turkic cultures developed (Dudashvili 2001: 32–33; Buriakov 2000: 93–96). Peoples from India, Sogdia (now western Uzbekistan and parts of Kazakhstan), Syria, Persia, China, and the northern steppes settled in these towns, bringing with them their own



**FIGURE 3** Excavation of a statue of the Buddha in Nirvana at the second Buddhist temple (seventh–eighth century). © UNESCO/Japan Trust Fund Chui Valley Project in Kyrgyzstan

religious and cultural traditions (Sulaimanov, Tashbaeva, and Japarov 2002: 44–45).

The Chinese pilgrim Xuanzang mentioned the towns when he visited the area around 620 C.E., when Navikat in particular was one of the most important urban settlements in the Chui River valley and in the Tian Shan region (Litvinsky, Zhang Guang-da, and Shabani Samghabadi 1996: 170–91). Archaeological excavations in and around the ancient town of Navikat have yielded a Zoroastrian fire altar and grave site in the western suburbs, Nestorian Christian votive stones in the citadel, and two Buddhist temples south of the town walls.

Figure 3 shows work on a statue of the Buddha in Nirvana at the second Buddhist temple (seventh–eighth century), which was excavated some twenty years ago by the Kyrgyz archaeologist Valentina Goryacheva and other Russian archaeologists. The temple contains a well-preserved sanctuary whose ruins were backfilled to prevent further degradation. Much of the remaining temple site, however, was not backfilled, and no protective measures were taken. UNESCO intervened and carried out urgently needed conservation, thereby preventing the loss of this unique monument of early medieval Buddhism in Kyrgyzstan (Lin 2002). The conservation work consisted primarily of laboratory analysis and field conservation. Different soils were tested to identify those most compatible with the historical mate-

rials. Experiments were conducted on different mud-brick compositions, and six test walls were built. Field conservation activities included damage assessments at Navikat and emergency backfilling. A permanent weather station was established at the site to record and monitor daily temperature, precipitation, humidity, wind velocity, and air pressure. In addition, detailed research on the climate, geology, and hydrogeology of the second Buddhist temple site has provided the additional data necessary to make decisions regarding conservation issues.

Although the UNESCO program in the Chui River valley focuses on Navikat’s second Buddhist temple, it is also concerned with conserving an Islamic tower at Balasagyn (Burana) (fig. 4) and with emergency conservation activities at the ruins of a Nestorian (Christian) church at Suyab (present-day Ak-Beshim) (fig. 5). The overall conservation program includes a strong documentation and research component, which is essential to enhance understanding of these little-known sites and to identify the best approaches for their conservation and preservation. A master plan for the conservation and maintenance of the Chui River valley cultural heritage sites is also being drawn up in preparation for their potential inscription on the UNESCO World Heritage List.



**FIGURE 4** Late-tenth-century C.E. Islamic tower at Balasagyn (Burana). © UNESCO/Japan Trust Fund Chui Valley Project in Kyrgyzstan





**FIGURE 5** Ruins of eighth-century C.E. Nestorian church at Suyab (Ak-Beshim). © UNESCO/Japan Trust Fund Chui Valley Project in Kyrgyzstan

### Fayaz-Tepa, Uzbekistan

Southern Uzbekistan is extremely rich in cultural heritage sites that reflect the region's multicultural and multiethnic history. The region contains many important Islamic monuments, such as the mausoleum of Hakim Termezi, the Jarkurgan minaret, and the Sultan Saodat complex, as well as monuments of a secular nature, such as Kirk-Kyz castle,

the citadel and ramparts of Old Termiz,<sup>3</sup> and the remains of the Karakhanid wharf along the Amu-Darya River. Many monuments also relate to Buddhism, such as those found at Kara-Tepa, Airtam, Zurmara, Dalverzin-Tepa, and Fayaz-Tepa, site of the third UNESCO/Japanese Funds-in-Trust project (Buriakov 2000: 54–57).

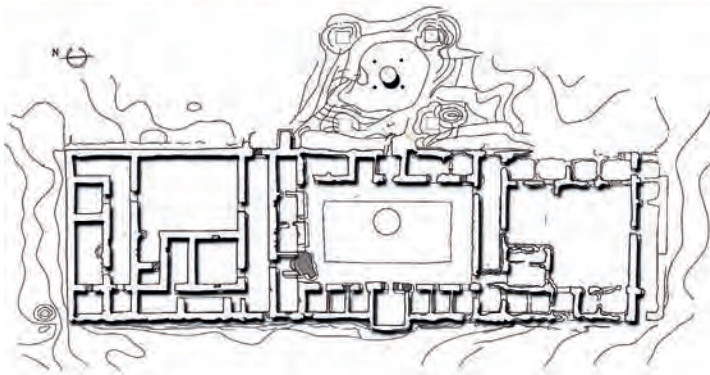
Fayaz-Tepa contains a small Buddhist temple (fig. 6) built of sun-dried mud bricks on flat land and located near the city of Termiz, in the southeastern tip of Uzbekistan. The complex, which measures 34 by 117 meters and dates to the first century B.C.E. (Al'baum 1960: 18–27), consists of a stupa (a dome-shaped religious shrine) and a monastery.

This UNESCO project, which began in August 2000 and is expected to be completed in June 2006, aims to preserve and restore the temple ruins as witness to the role played by this region in the transmission of Buddhist culture and art; to contribute to the development of sustainable economic activities at the site through the improved presentation of cultural assets and the development of tourism-related economic activities; and to build national capacity in the management of cultural resources, notably by providing professional in-service training to the experts with the Institute of Restoration, Ministry of Culture, Uzbekistan.

The Buddhist ruins at Fayaz-Tepa are an important reminder of the many cultures and religions that have contributed to Uzbekistan's history and identity. The UNESCO



**FIGURE 6** Ruins of first-century C.E. Buddhist temple at Fayaz-Tepa (top); temple map (bottom); and Buddha sculpture (right) found at the site. © UNESCO/Japan Trust Fund Fayaz-Tepa Project in Uzbekistan



project therefore aims to build awareness of the region's multicultural and multiethnic past and present. This is especially important at a time when the peace and stability of the region are threatened by the spread of religious extremism.

### **Ajina Tepe, Tajikistan**

The fourth UNESCO/Japanese Funds-in-Trust project, which began in May 2005 and is expected to be completed by 2008, is the preservation and restoration of the ruins of a Buddhist monastery built from the fifth to eighth century C.E. at Ajina Tepe (Hayashi 2003). This site, in western Tajikistan, is located 13 kilometers east of the city of Kurgan-Tube, a town close to the Tajik border with Afghanistan. It was excavated during the 1950s and 1960s by archaeologists from the then Soviet Union.

The monastery, which is a significant example of the Buddhist architecture of central Asia (Litvinsky and Zeimal 1971), originally consisted of two halves that made up a single large complex of religious and residential buildings, each half occupying an area of approximately 50 by 100 meters. The monastery consisted of numerous cells that served as assembly rooms for the monastic community and as refectories, as well as halls linked by winding, vaulted corridors. At the end of one corridor, a 12-meter-long statue of the recumbent Buddha in Nirvana was found on a large pedestal that occupied almost the entire length of the hall (fig. 7).

Following Tajikistan's independence from the Soviet Union in 1991 and as a result of subsequent internal conflict and civil war, the country today suffers from a serious shortage of human resources in the cultural field, including heritage and conservation specialists. It also lacks appropriate infrastructure and heritage conservation institutions. There is an urgent need for appropriate training in the fields of cultural heritage conservation and management and in capacity building, both at the technical and management levels (Lin 2004). For these reasons, UNESCO's work at Ajina Tepe also includes training of national conservation experts and officials. This should enable these professionals to undertake other, larger projects elsewhere in the country in the future.

### **Conclusion**

The ancient sites at Otrar in Kazakhstan, in Kyrgyzstan's Chui River valley, at Fayaz-Tepa in Uzbekistan, and at Ajina Tepe in Tajikistan date from different periods in the history of the region and bear witness to the civilizations and



**FIGURE 7** The 12-meter-long Buddha in Nirvana statue (7th century C.E.) from the Ajina Tepe Buddhist monastery.  
© UNESCO/Japan Trust Fund Ajina Tepe Project in Tajikistan

religions that flourished in it. These sites, which had been threatened by deterioration, are being preserved for future generations thanks to the trust fund arrangements established at UNESCO by the Japanese government. A further aim of the UNESCO work is to raise awareness of the multicultural history of the region, which once stood at the crossroads of religions, cultures, and civilizations.

The four projects described in this paper, in addition to fostering educational and cultural tourism activities at the sites, are helping to build national and regional capacity in project management of cultural heritage and in conservation techniques through the exchange of expertise among international, national, and regional professionals. The practical experience gained during the projects' implementation by national and regional experts trained in the most up-to-date techniques and to international standards will allow them to undertake similar projects elsewhere in the region, with or without the direct involvement of UNESCO. This training is especially important with the loss of state funding to the culture sector in these countries after the breakup of the former Soviet Union.

### **Acknowledgments**

Francis Childe, my colleague in the Division of Cultural Heritage at UNESCO, is responsible for the UNESCO/Japan Funds-in-Trust projects mentioned in this paper. Roland



Lin Chih-Hung manages the Otrar project in Kazakhstan and the Chui Valley project in Kyrgyzstan; Nao Hayashi and Roland Lin Chih-Hung jointly manage the Ajina Tepe project in Tajikistan. The Fayaz-Tepa project is managed by Barry Lane and Igor Chantefort of the UNESCO Office in Tashkent, Uzbekistan. Francis Childe, Roland Lin Chih-Hung, and Nao Hayashi contributed to this paper.

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## Notes

- 1 *Chui* and *Chuy* are common spellings for this river, although it is spelled *Shö* in the *National Geographic Atlas of the World* (8th ed.).
- 2 Issyk-Kul is spelled *Ysyk-Köl* in the *National Geographic Atlas of the World* (8th ed.).
- 3 Also spelled *Termez*.

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# Nomination of the Silk Road in China to UNESCO's World Heritage List: Proposals for a Strategic Approach and Reference Framework for Heritage Routes

Ron van Oers

**Abstract:** *In the conservation discipline today, there is a tendency toward an increase in geographic scale and variety of categories in properties and sites considered for protection, conservation, and nomination to UNESCO's World Heritage List. More attention is being given to cultural landscapes, cultural ensembles in their wider natural setting, and, eventually, to protecting and managing heritage routes—defined as physical or perceived representations of frequent and repeated movement, linking places in time and space and generating an exchange of goods and ideas. Consideration of this category for protection and conservation is highly experimental, and today only four routes are registered on the World Heritage List: the Route of Santiago de Compostela in Spain and France, the Frankincense Trail in Oman, the Sacred Sites and Pilgrimage Routes in the Kii Mountain Range in Japan, and the Incense Route–Desert Cities in the Negev in Israel. The protection extends to the route itself, as well as to selected buildings and settlements located alongside it. It would be more pertinent to adopt an approach that recognizes the immaterial and diffuse nature of a heritage route and the dynamic effects of transmission and impact. All this involves the protection and conservation of a series of elements of various natures, linked by a physical or perceived artifact. UNESCO's World Heritage Centre is currently assisting the Chinese authorities in exploring the possibility for a serial nomination of the Silk Road's Oasis Route in China to the World Heritage List. This paper discusses proposals for a strategic approach and reference framework for this serial nomination, using examples of already established World Heritage sites to define appropriate strategies for conservation and management.*

Heritage routes are the latest development in a trend to expand the scale and complexity of heritage properties. Briefly, a heritage route is a series of culturally and historically important elements, incorporating tangible and intangible values, that are linked by a physical or perceived artifact, such as a road or route that may or may not still exist. Before heritage routes can be inscribed in the World Heritage List, the concept requires a consolidated approach and framework for their identification, nomination, and effective management. This paper discusses heritage routes through the application of the concept to the Silk Road in China, specifically, the section known as the Oasis Route.<sup>1</sup>

## Heritage Routes and the World Heritage List

A property can be registered on the World Heritage List only if physical evidence of its existence remains and this evidence can be protected and preserved for future generations. Physical remains that have been radically altered would not be eligible. Likewise, conservation of conjectured elements is not accepted by the international professional community, including the World Heritage Committee, as stated in the Venice Charter (International Council on Monuments and Sites 1964: art. 9). What constitutes physical evidence of a heritage route, however, is something that is still open to broad interpretation.

Physical evidence of heritage routes sometimes may be found in the form of roads, as in the case of the Camino Inca referred to by the Oxford historian Fernández-Armesto (2001: 290–92): “Historians of the early colonial period, likening the Incas to the Romans, exaggerated the uniformity of their institutions and the centralized nature of their govern-

ment. Still, the intrusive nature of their rule is apparent in the evidence they have left of how to manage a high-altitude empire: relics of the extraordinary road system.” In other cases, however, physical evidence has disappeared or been replaced by a new system. For example, the Via Appia Antica still has the same structure, whereas the 962-kilometer stretch of the Via Aurelia from Rome to Arles has been replaced by a modern road. Similarly, in the case of the Silk Road in China, almost all the original road—if one existed; much of it consisted of tracks through the desert—has disappeared and been replaced by a four-lane highway. How to deal with this?

Discussions on improved identification and representation of heritage categories have been going on at least since the early 1980s. Over the past decade, in particular, our view of the meaning and value of heritage has been refined significantly. In 1992 its interpretation was broadened tremendously with the addition of cultural landscapes as a new category for World Heritage listing and a new criterion (vi) for cultural properties. The World Heritage Committee supported this interpretation with the adoption of its *Global Strategy* (1994) and with the *Nara Document on Authenticity* (1994).

A further refinement of heritage categories is the anthropological interpretation in the cultural heritage field that has led from the protection of architectural and monumental heritage to recognition of the living, spiritual heritage of indigenous people and their interconnections with the physical, natural environment. Although Choay (1992) had already remarked on this notion of heritage more than a decade ago, it has not yet been applied widely but mostly by a selection of professionals and specialized institutes in Western countries. Along with broadening our interpretation of cultural heritage, we need to expand our notion of conservation; that is, “conservation as a *social process* that is best seen more inclusively, encompassing the creation of heritage, interpretation and education . . . to acknowledge the importance of social and economic values along with the traditional notions of conservation value, such as age, aesthetics, and historical significance” (Avrami, Mason, and de la Torre 2000: 68–70).

### Defining an Emerging Concept

What constitutes a heritage route has not yet been properly described and is an issue in ongoing debates, in particular, by the International Scientific Committee on Cultural Routes (CIIC) of ICOMOS (International Council on Monuments and Sites), UNESCO's advisory body for cultural heritage. This committee developed out of a meeting on the topic of

cultural routes (an early term replaced by *heritage routes*)<sup>2</sup> held in Madrid in November 1994 following the inclusion of the Pilgrim's Route to Santiago de Compostela on the World Heritage List. The official creation of the CIIC in 1998 was a direct result of the conclusion that more in-depth studies were needed to further the conceptual and operational development of heritage routes. Since 1998, eight international scientific meetings have been held on the topic.

Among the definitions for *cultural route* adopted by the CIIC at its meeting in Tenerife in September 1998 is the following, reported in the conclusions of *Intangible Heritage and Cultural Routes in a Universal Context* (2001):

The concept of a cultural route or itinerary refers to a set of values whose whole is greater than the sum of its parts and through which it gains its meaning. Identification of the cultural itinerary is based on an array of important points and tangible elements that attest to the significance of the itinerary itself. . . . To recognize that a cultural itinerary or route as such necessarily includes a number of material elements and objects linked to other values of an intangible nature by the connecting thread of a civilizing process of decisive importance at a given time in history for a particular society or group.

In principle, it was argued that the definition of *heritage route* should make reference to some key features; as such, a heritage route could be defined as a physical or perceived representation of frequent and repeated movement over a significant period. A heritage route links places in time and space, over land or water or both, or otherwise, and generates, in addition to an exchange of goods and ideas, a cross-fertilization within or between cultural regions of the world.

By this definition, a road would be a physical representation of a heritage route, while a sea lane, for instance, would be a perceived one (as it usually only constitutes a dotted line on a seafarer's map). The 2002 *Operational Guidelines for the Implementation of the World Heritage Convention* referred to heritage routes as “long linear areas which represent culturally significant transport and communication networks.”<sup>3</sup> It would be more appropriate to use the term *system*. During a meeting in Madrid on May 30 and 31, 2003, experts and representatives of ICOMOS and UNESCO further agreed that continuity and dynamism—as opposed to the far more static nature of a landscape—are also essential aspects of a heritage route.

### Routes as World Heritage: Types and Forms

No clear model exists for the nomination of heritage routes to the World Heritage List. Below I briefly discuss some core aspects of inscribed World Heritage properties with typological and/or physical similarities to heritage routes. Several heritage routes have been inscribed on the World Heritage List. If a road is considered a (segment of a) line, with start and end points, and is of considerable length and limited width, then theoretically a heritage route as a linear nomination constitutes a continuous nomination, where every point along the line is proposed for inscription. The following typology of heritage routes, many of which were inscribed as linear nominations, gives an indication of how this has been applied in practical terms.

1. Transportation (all featured under the category “Industrial Heritage”)
  - Railways*
    - Semmering Railway (Austria, inscribed in 1998): linear nomination, including several properties (mostly villas) along the railway
    - Darjeeling Railway (India, inscribed in 1999)
  - Canals*
    - Canal du Midi (France, inscribed in 1996)
2. Trade Routes
  - Frankincense Trail (Oman, inscribed in 2000): linear nomination, including a serial nomination of four archaeological sites
3. Religious Roads
  - Camino de Santiago (Spain, inscribed in 1993): linear nomination, including several properties along the road
  - Camino de Santiago (France, inscribed in 1998): linear nomination, including a serial nomination with about seventy properties inscribed
4. Linear Monuments (e.g., fortifications/defensive structures)
  - Great Wall (China, inscribed in 1987)
  - Hadrian’s Wall (England, inscribed in 1987): linear nomination, including several properties along the wall
  - Defence Line of Amsterdam (Holland, inscribed in 1996): this property also falls into the canals classification.

A closer look reveals that these have a formal, materialized linear element as their core property, as opposed to a network

or system that perhaps does not necessarily have a physical linear structure as its core (e.g., a maritime route). This rather narrow definition has no doubt limited the identification and nomination of other properties that might have been included under the broader concept of heritage route.

Furthermore, all these routes (including linear monuments) have structures and settlements associated with them. This is most apparent in the following cases:

- Camino de Santiago. This route was inscribed as a linear nomination with a protected 30-meter strip of land on either side of the road. This protection zone broadens out in places to include towns, villages, and buildings that are already protected for their cultural value under Spanish law.
- Semmering Railway. Construction of the 41-kilometer-long railway across the Semmering Pass between 1848 and 1854 led to the creation of a cultural landscape with villas and hotels along much of its route. This is an outstanding example of a sympathetic insertion of buildings of high and consistent architectural quality into a natural landscape.
- Hadrian’s Wall. Almost one hundred monuments are associated with the wall, including forts, ditches, roads, and rampart walks, forming an outstanding ensemble of defensive constructions and settlements in an archaeological zone that is the largest in the United Kingdom.

A proper inventory of the structures and settlements along a route seems essential to establish its nature and the most appropriate inscription: linear (one continuous property), serial (a property consisting of clusters of sites, which can be discontinuous), or mixed. Furthermore, a route cannot be dissociated from its context (e.g., the landscape). Therefore, analysis of ancient and modern topography, using historic maps, is essential for assessing the value of this aspect of the property to be nominated.

### Integrity and Authenticity Applied to Heritage Routes

Among the criteria used for the inscription of properties on the World Heritage List are *integrity* (a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes) and *authenticity* (the value attributed to the heritage, depending on the degree to which information

sources about this value may be understood as credible or truthful). Initially, the condition of integrity was applied primarily to natural sites, and the test of authenticity was reserved for cultural sites. Recently, with the introduction of cultural landscapes, integrity is being applied increasingly to cultural sites. Von Droste zu Hülshoff explains that “the notion of ‘integrity,’ even in its common use referring to ‘wholeness,’ has an ecological basis. Integrity relates to the maintenance of functional relationships between components of a system. When applied to World Natural Heritage Sites, one can describe conditions which are essential for the maintenance of the integrity of particular World Heritage values” (UNESCO 1998: 13). The issue seems relevant to heritage routes as well.

During the 2001 Thematic Expert Meeting on Asia-Pacific Sacred Mountains in Wakayama, Japan, it was determined that integrity implies a balanced state of ecological systems and aesthetic, cultural, religious, or artistic associations. As is the case for sacred mountains, protecting the integrity of heritage routes may need to take into account evolving cultural practices, including traditional ecological, engineering, and construction knowledge; that is, “an enhanced appreciation of the interface between ecology and culture as a dynamic basis for maintaining the integrity” of a heritage route must be considered.

It may be obvious to many that for heritage routes the condition of integrity should apply, but how to deal with the test of authenticity remains a dilemma, since the original function of the route usually has disappeared over time. Nevertheless, this would still leave cultural sites, properties, and natural areas along the route that are of historic and scientific importance, authentic, and worthy of protection and conservation. The current *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO 2005) state that the authenticity of a heritage route can be assessed on the grounds of its significance and, moreover, on the duration of the route itself, as well as “the legitimate wishes for development of peoples affected.” What does this mean for heritage routes?

The Asia-Pacific Sacred Mountains Expert Meeting also indicated how authenticity—as defined in the *Operational Guidelines* and the *Nara Document on Authenticity* (UNESCO 1994)—could be applicable to heritage routes: it “should encompass the continuation of traditional cultural practices.” “This authenticity, however, must not exclude cultural continuity through change, which may introduce new ways of relating to and caring for the place.” Furthermore, in order to

determine authenticity and to protect it, one needs to examine closely the distinctive character and components of tangibles, and the associated intangible values, that represent the outstanding universal significance of the heritage route.

Thus applying integrity and authenticity to heritage routes involves the protection and conservation of a series of elements of various natures, incorporating tangible and intangible values, linked by a physical or perceived artifact, like a string of pearls. The pearls, essentially, are significant places of memory that constitute the main story line: they are sites that have outstanding universal value (OUV), the main criterion for World Heritage listing.

### The Great Silk Road: Statement of Significance

Many routes of cultural-historical importance have linked great civilizations and thereby shaped world history. As Fernández-Armesto (2001: 71) points out, “Avenues across the Gobi and Takla Makan were part of the web of silk roads that linked the civilizations at either end of Eurasia. . . . Chinese science and technology were diffused across Eurasia partly by maritime routes but also, vitally, via the deserts which the silk roads crossed.”

The global significance of the great Silk Road needs hardly be debated anymore. Indeed, for more than a decade it has been part of the UNESCO project *Integral Study of the Silk Roads: Roads of Dialogue*. In the introduction to *The Silk Roads: Highways of Culture and Commerce*, which contains papers written for conferences held in the context of the UNESCO Silk Road project, Elisseeff explains:

These roads, regardless of how they were called, have been known to humanity for many centuries and, as far as the major routes are concerned, for several millennia. Most of them are the descendants of natural roads following patterns of vegetation whose ecological qualities enabled man and beast to thrive in the days when paleolithic hunters tracked their game. These historical routes are also terrestrial and maritime, running from east to west and corresponding to waterways that run from north to south. They introduced sedentary and nomadic populations, and opened up a form of dialogue between the cultures of East and West. (2000: 2)

Concerning the significance and impact of the Silk Road in China, Elisseeff (2000: 265) states, “Until the last three



hundred years, most of the inventions and technical advances which made a real difference to people's lives came from China—including, most notably, paper, the printing press, the blast furnace, competitive examinations, gunpowder, and—among many critical innovations in marine technology—the ship's compass. Long sustained Chinese initiative depended on the availability of routes of transmission."

Spanning a quarter of the globe, the Silk Road brought not only goods such as silk and spices to the Western world but also objects of gold, glass, and other prized Roman creations to the elite of the Orient. The first route joining the Eastern and Western worlds, the Silk Road may also be given a spiritual identity: along these roads technology traveled, ideas were exchanged, and friendship and understanding between East and West were experienced for the first time on a large scale. Therefore, the importance and value of the Silk Road can be related to the unity it brought about, leading Zekrgoo (2000: 126) to state that "the great Silk Road may be counted as the most important route in the history of mankind."

We can extend this statement and argue that the immaterial aspect of heritage routes is more important than the material, that is, in this case, the Silk Road as a vehicle for cross-cultural exchange. In doing so, Sugio writes:

The present Silk Road is not found to have been preserved in its perfect form up to the present, but the intangible heritage, such as the characteristics of surviving race surrounding the route and the minority race, their figures, the genes, languages, cultural properties, clothing, living styles, agricultural methods, city structures, architectural styles, customs, manners, political systems, religions, traditional skills, industries, arts, music, etc., are continuing distinctly still now. Therefore even though it is not necessarily existing or is preserved as a road in a clear form, its existence and value as a cultural route becomes evident when the existence of intangible heritage is traced back. (2001: 44)

It seems that heritage routes, even more than cultural landscapes, can be considered halfway between tangible and intangible heritage, containing a significant part of each domain.<sup>4</sup> Therefore, in order to preserve the legacy of the Silk Road in a comprehensive manner, more than just monuments and sites need to be taken into account. In addition to all the elements that would normally be considered in the protection

of cultural landscapes, one fundamental aspect to consider for heritage routes would be elements and aspects related to the *movement of people and goods* (transportation, vistas for orientation, beacons and communication towers, etc.).

It would be more pertinent, therefore, to adopt an approach that recognizes the immaterial and diffuse nature of a heritage route, the dynamic effects of transmission and impact, including all fields of human activity connected to the road, such as politics, commerce, science, religion, and culture. For the Oasis Route in China, in particular, elements and aspects to consider should include oases and agricultural systems, engineering and transportation, caves for shelter and prayer, open landscapes for contemplation and spiritual motivation, vistas for orientation, and resting and trading places with bazaars and caravanserais, but also transit points between different realms of power, such as military garrisons, fortifications, beacons, and communication towers. In this way, a better representation (of values) through significant aspects and elements as part of the nomination can be guaranteed.

### China's Oasis Route

In China, the section of the Silk Road known as the Oasis Route stretches roughly 4,450 kilometers from Xi'an in Shaanxi province to Kashgar in Xinjiang Uyghur Autonomous Region. The number of monuments and sites along this route is vast. What follows is a proposal for a systematic approach and reference framework for the identification, nomination, and management of the Oasis Route as a heritage route.

### Identification and Nomination

From August 21 to 31, 2003, with sponsorship by the government of the Netherlands, the first of three identification missions took place along the Oasis Route in China, involving Chinese officials from the State Administration of Cultural Heritage (SACH) and staff of UNESCO's World Heritage Centre. The second mission was conducted in July 2004, and the third mission is scheduled for 2006. This ongoing project aims to facilitate discussion on and enhance the understanding of the identification of heritage routes and their nomination to UNESCO's World Heritage List. This effort contributes to an initiative that is foreseen to have a significant impact on current thinking about conservation projects and their operationalization.

While the significance and importance of nominating the Oasis Route to the World Heritage List was clear to

the Chinese authorities (out of the more than eighty sites on China's Tentative List, this was given a priority for nomination), how exactly to proceed in this major endeavor remains a question. The Silk Road nomination initiative is broad in scope, requires substantial resources, and must take into account the long-term planning and complexity of a World Heritage listing. Given this, it is imperative to properly structure the nomination process to avoid a random selection of culturally-historically important places along the Silk Road and in the process lose overview and context.

The nomination effort should be holistic and focus on the identification and justification of those aspects and elements of the Silk Road that will "tell its story" in a comprehensive manner. This means that to understand and appreciate the full dimension of the Silk Road as a heritage route and its cultural-historic significance, a wide variety of elements need to be considered. In addition to the obvious grand sites, perhaps supplementary structures and landscapes should be included. The SACH/UNESCO identification missions took the broadest possible view in their discussions of the inclusion of elements (engineering, military, transportation) in addition to recognizable properties, such as buildings and settlements (living or archaeological sites and ruins). Since abundant research and documentation on the Silk Road exists, what is needed now is the definition of a vision and proper methodology pertinent to the concept of heritage routes. This would call for the repackaging of existing information and a proposed framework to facilitate the preparation of an incremental serial nomination, that is, a phased nomination of a series of clusters of heritage sites linked by and representing the Silk Road.

A reference framework, according to Avrami, Mason, and de la Torre (2000: 10–11), should consist of "a set of theories, documented patterns, and processes that outline cultural-historic significance and identification and presentation of its workings, i.e., the elements and aspects that define the whole," which should be understood as the modeling of the social, economic, and cultural impacts and influences of the Silk Road, "just as ecological models create an understanding of the natural environment to inform natural conservation."

A first step in the nomination initiative for the Oasis Route in China as a heritage route is to finalize a definition of the concept and subsequently to determine the significant elements that constitute a heritage route as applied to the Silk Road. It will then be possible to sketch a broad picture of the meaning and impact of the Silk Road and establish

where essential aspects have coalesced and materialized. This approach should be the focus of the nomination process.

*Beyond OUV.* As argued above, in defining the significance and value of heritage routes, perhaps it will be necessary to look beyond properties and sites of outstanding universal value and consider other elements that are needed to fully understand and appreciate context and relationships—elements that would give the story more depth and character. Blair and colleagues (2001: 230) argue in this regard that "routes are, *par excellence*, the sum of their parts— . . . no site in isolation perhaps crossing the threshold for heritage listing—but a combination of sites forming a powerful and significant cultural experience." Perhaps the issue is more pertinent and complex. Whereas individual sites *need* to cross the threshold in order to obtain World Heritage status, the protection and conservation of additional elements, which might not necessarily be of OUV, need to be taken into consideration as well. For example, in the case of the Mogao Grottoes (listed as a World Heritage Site in 1987, under Cultural criteria i, ii, iii, iv, v, vi)—obviously one of the grand sites along the Oasis Route in China—it may be pertinent to include elements that initially seem to have little to do with the Buddhist art in the caves. Thus in order to preserve the memory of the Oasis Route, references other than the wall painting depictions, such as those at cave 103 showing Xuan Zang's journey to India traversing the Pamirs in search of Buddhist scriptures (Whitfield, Whitfield, and Agnew 2000: 25), should be maintained.

More and more heritage sites in the world, certainly in China, are becoming detached from their original settings and meanings, as governments try to maximize development opportunities and in the process isolate sites. When twenty years from now the access road to Mogao has been turned into a circus fair, with high-rise hotels, restaurants, service stations, and perhaps a whole new town, what remains of the experience of a formerly remote desert site attached to an oasis along a trade route? The oasis is gone, the trade route is gone, and the desert landscape is visible only in the far distance. The immediate experience is one of modernization and comfort. Thus there is a need to establish a wide perimeter around the core zone where references to the oasis, trade route, and remote location are maintained.

While the caves' extraordinary collection and quality of Buddhist art that came to China along the Silk Road are unquestionable, and indeed of OUV, it can be argued that the site gains even more significance if one properly understands the conditions under which this magnificent art was

produced, by whom, where, and why. Imagine artist-monks in an oasis, providing a safe haven, both physically and spiritually, to travelers at a remote location along the Silk Road in the incredibly harsh environment of the Takla Makan, one of the most fearsome deserts in the world: all these elements constitute an essential contribution to appreciating this site to the fullest. The Mogao Grottoes site thereby gains even more value. Indeed, this context constitutes one of the intangible values of the site.

With the current pace of development everywhere in China, there is a serious danger that soon only the formal World Heritage Site will remain (i.e., the caves with Buddhist art) and that its context and relationship with the Silk Road will be understood only through a one-line mention in a presentation brochure. The physical experience of visiting a remote site—an important aspect of the encounter—will have disappeared if visitors arrive at the site by driving through a modern city, stepping from an air-conditioned car into an air-conditioned interpretation center and then immediately onto the site; they will not even know that they are in a desert. In practice, this means that, in addition to the caves themselves, this World Heritage Site should be expanded to include areas associated with the caves and that this expanded site should be protected, managed, and presented to provide the fullest possible setting. This expanded area would encompass the oasis, with unobstructed vistas into the surrounding desert through which the ancient Silk Road once passed. In other words, this expanded site would be part of a Silk Road heritage route. Any kind of development should be located outside a wide perimeter around this expanded heritage site.

*“Borrowed scenery.”* Beyond the intangible aspects of cultural heritage, physical setting is a factor that is receiving increasing attention. For heritage routes, this seems of particular importance because in principle they were formed or guided by geologic formations as they crossed natural and cultural landscapes. In this regard, a concept that could be of use in defining cultural sites in their context and setting, and the extent of their significance in direct relationship to a heritage route, would be *shakkei*, or borrowed scenery. *Shakkei* is used in Japanese garden design as “a technique for enlarging the visual scale of the garden beyond its actual physical boundaries by incorporating a distant view as an integral part of the garden” (Keane 1996: 140). Borrowed scenery was an important technique in the planning and design of Chinese gardens as well, where not only could scenery be borrowed, but forms, sounds, colors,

and fragrances were also incorporated into gardens (Liyao Cheng 1999: 135).

The importance of the surrounding landscape in the context of the Silk Road becomes apparent when one realizes that silk, as a commodity in ancient times, was so highly valued precisely because of the hardships merchants had to endure to bring it to the markets in the West. As Bonavia and colleagues write, “The early trade in silk was carried on against incredible odds by great caravans of merchants and animals travelling at a snail’s pace over some of the most inhospitable territory on the face of the earth—searing, waterless deserts and snowbound mountain passes. . . . Blinding sandstorms forced both merchants and animals to the ground for days on end . . . and altitude sickness and snowblindness affected both man and beast along cliff-hanging and boulder-strewn tracks. Death followed on the heels of every caravan” (Bonavia, Lindesay, and Wu Qi 2002).

For the Chinese section of the Silk Road, in particular, around the Takla Makan, the oasis towns therefore were of paramount importance, as they allowed the caravans to make and survive the overland journey. Very few caravans, including the people, animals, and transported goods, completed the entire route that connected Rome and Xi’an, the capitals of the two great empires. The oasis towns provided the caravans with fresh merchants, animals, and goods and became important trading posts and commercial centers. In light of this, preserving the urban and architectural heritage of these towns alone would not allow comprehension of their significance—even if the towns were of outstanding universal value. Preserving the traditional agricultural practices and supportive engineering structures that provided for water, for instance, would be *at least* as important in telling and understanding the story as the towns themselves: one could say that the expanded context constitutes “borrowed scenery.”

*Anchor sites versus support sites/structures.* For the purposes of identifying heritage routes, it is advisable to distinguish between anchor sites and support sites or structures. Anchors would be those sites considered to have outstanding universal value; support sites or structures do not necessarily possess OUV but are nevertheless an important complement to the picture. Support sites or structures will therefore have to be connected, physically and/or conceptually, as a cluster to the anchor sites. With regard to protection, conservation, and management of both anchor sites and support sites or structures, however, there should be little distinction: they deserve equal care and resources to guarantee their preservation for future generations.

## Management

Establishing a national management unit would be an appropriate way to oversee and guarantee high and consistent levels of management of the Oasis Route as a heritage route, which would consist of clusters of heritage sites along the road's more than 4,000-kilometer length. Given China's centralized structure, this would be easy to achieve. Such a national management unit could be entrusted with the classification of the different site clusters, which could be divided according to their main themes: Art (Buddhist, Islamic, other), Architecture (temple, urban, vernacular), Archaeology (cities, monuments), Religion (temples, mosques, meeting points), Military Engineering (garrison stations, forts, walls, towers), Agriculture, Trade, and Manufacture (farming, hydraulic systems, markets, caravanserais), Travel and Transportation (engineering structures, resting places, orientation beacons), and so on. This division could also include combinations of several themes. Identification and management of properties and sites according to these themes would allow for a broad spectrum and subsequent representation of important aspects related to the Silk Road.

Laws and management practices should be uniform for all site clusters. However, separate conservation management plans should also be prepared for each cluster, according to its characteristics and associated values (both tangible and intangible), with a clear division into anchor and support sites. The national management unit would supervise preparation of plans and enforcement of laws for all clusters in accordance with the highest international standards. In addition, local teams would be responsible for the conservation management plan for individual site clusters to ensure the inclusion of regional or local characteristics and practices, as well as to facilitate communication and community participation.

Over time and when more information and resources become available, decisions can be made at the national level to extend sites or include other sites on the heritage route, actions that would significantly enhance the picture of the Silk Road in China. This is something that would be difficult to achieve on a decentralized regional level. Furthermore, tested and tried concepts could be further developed in association with neighboring countries that are considering connecting their most significant Silk Road sites to those in China, thus creating a single, multinational Silk Road heritage route.

For this reason, the third Silk Road identification mission in 2006 by representatives of China's State

Administration of Cultural Heritage and UNESCO's World Heritage Centre will involve the road's central Asian stretch into India, Kazakhstan, Kyrgyzstan, and beyond. Ultimately, this endeavor should result in an incremental, multinational, transboundary serial nomination of the Silk Road Heritage Route to the World Heritage List. The aim is to protect the Silk Road from Xi'an in China to the coastal regions of the Mediterranean Sea in a phased process of incorporating several clusters of properties, sites, and landscapes, both cultural and natural, that are linked by a shared vision and set of values and whose protection is formalized by unified conservation approaches and management plans. All this would be done according to the pace of the various countries involved.

## Conclusion

Heritage routes are the latest development in a trend to expand the scale and complexity of heritage properties. Heritage routes require a holistic approach and a new framework for conservation that will foster understanding and serve as a tool for informed decision making.

Beyond the intangible aspects of heritage routes, their physical setting should be taken into account because in principle the routes were formed, or guided, by geologic formations and crossed natural and cultural landscapes. Traditional land-use and land management practices, which have ensured the long-term protection of sites, should be taken into consideration as well when planning protection and conservation activities. Emerging from this view of heritage routes is a combination of anchor sites and support sites or structures that would allow a full understanding and appreciation of context and relationships. There would be little distinction between the two types of sites, as all would need to be protected and managed to guarantee their preservation for future generations.

Laws and management tools should be uniform for all heritage site clusters that are part of a heritage route, and these should be supervised from a national level. However, separate conservation management plans should also be prepared for individual clusters, taking into consideration unique characteristics and associated values (both tangible and intangible) of the sites. Individual, local management teams would be responsible for these plans. This approach would guarantee the inclusion of regional or local characteristics and practices in the management plans and facilitate community participation in the protection of the sites.

In terms of the Silk Road (Oasis Route) in China as a heritage route, only those sites that will explain and present the road in a comprehensive manner should be the focus of identification, protection, and conservation efforts. A Chinese section of the Silk Road heritage route would require the inclusion of a wide variety of elements that relate to the movement of caravans with people and goods, not just the obvious “grand sites.” Furthermore, different clusters of monuments, sites, and landscapes could be identified according to main themes or a combination of several themes. Over time Silk Road sites in other countries could be included, extending the heritage route beyond China and linking its elements with a shared vision and set of values that will preserve for future generations the extraordinary legacy of the Silk Road.

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## Notes

- 1 The Silk Road is divided into three sections—the Steppe Route, the Oasis Route, and the Maritime Route (Elisseeff 2000: 13). This paper deals primarily with the Oasis Route in China, although the other routes also exist in and beyond China.
- 2 Although the term *cultural routes* was initially used by the CIIC, it was not accepted because it was considered too restrictive. Preference was given to the term *heritage routes*, which would also apply to routes linking natural heritage sites.
- 3 This reference appeared in par. 40 of the 2002 document but was taken out of the 2005 version.
- 4 See also the definition of *Intangible Cultural Heritage* in article 2 of the *International Convention for the Safeguarding of the Intangible Cultural Heritage* (UNESCO 2003).

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