

Fifteen Years at Angkor

ANCIENT SEAT OF THE KHMER EMPIRE

by JOHN H. STUBBS

Angkor, a vast Hindu-Buddhist temple complex in north-central Cambodia, is among the most magnificent architectural wonders of Southeast Asia. Founded more than a millennium ago, this ancient city was the one-time seat of the mighty Khmer Empire, which ruled most of the region between the ninth and fifteenth centuries A.D. For all its splendor, the site, spread over more than 310 square kilometers, was all but lost to the outside world until French archaeologists began excavating in the early years of the twentieth century. With the outbreak of war in the 1970s and subsequent takeover of the country by the Khmer Rouge, all work ceased and the archaeological park went completely without maintenance, finally succumbing to the jungle again.

In 1989, World Monuments Fund sent an initial field mission to Cambodia to survey Angkor and evaluate the damage the archaeological park had suffered after 20 years of civil strife and international isolation. We discovered that the temples were relatively unaffected by the upheaval that shook Cambodia, though Angkor's caretakers were not so fortunate. Among the estimated 1.8 million Cambodians to die during the Khmer Rouge period were those with training and experience in operating the Angkor archaeological park and other heritage sites in the country. When the strife ended in 1978, less than a dozen Khmer custodians of Angkor had survived. Beleaguered Cambodia remained socially and economically isolated from the rest of the world for more than a decade. During this period of abandonment of more than 15 years most of the ancient complex lapsed into further decay amidst jungle vegetation.

The Ministry of Culture encouraged us to make recommendations for a project that would address fundamental preservation issues at Angkor. We selected Preah Khan (Sacred Sword), a twelfth-century Buddhist monastic complex located at the north edge of the Angkor Archaeological Park, as the site for pilot research and conservation.

Since 1991, we have concentrated our efforts on this temple complex, one of the most important monuments at Angkor, using it as a proving ground for innovations in conservation and perhaps most importantly, as a classroom to teach a new generation of experts in preservation.





THE EAST GOPURA, OR TOWERED ENTRANCE, OF PREAH KHAN BEFORE AND AFTER STABILIZATION, TOP AND RIGHT. FINELY SCULPTED CELESTIAL DANCERS, BELOW, GRACE A LINTEL IN THE HALL OF DANCERS.



Commissioned by King Jayavarman VII in 1191, Preah Khan occupies .5 square kilometers, with four concentric enclosure walls that embrace a labyrinth of shrines, courts, halls, and pavilions. A monument to religious tolerance, Preah Khan has sections dedicated to Buddhism, Hinduism, and veneration of ancestors. Thousands of Buddhist monks at Preah Khan lived side by side with practitioners of Hinduism. The Buddhist king is believed to have employed Hindu thinkers as bureaucrats. Several elements at the site show a mixture of these influences.

Preah Khan's Vishnu Complex, smaller than most of the other principal parts of the site, consists of shrines dedicated to Vishnu—a protector deity, who with Brahma the Creator and Shiva, goddess of destruction make up the Hindu Holy Trinity—joined by low galleries surrounding a central shrine.

Jayavarman's sacred sword, which preceded the king during religious processions, may have been housed in the Two-Story Pavilion, which has round stone columns—rare in Khmer architecture. The Dharmasala, located along the principal entrance route from the east and identified as a rest house for pilgrims, may also have served as a temple that housed the *agni*, or sacred flame. It is similar to 121 other structures built by Jayavarman VII throughout his empire, all of which conform to the same design. They are sturdily constructed, oriented east to west, with windows on the south side alone. If indeed they once held a sacred flame, they may have functioned as staging posts on a ritual journey.

Preah Khan still features spectacular sculpture. The Hall of Dancers, once a large vaulted space with small courtyards, features lintels decorated with finely-sculpted *apsaras*, celestial female danc-

ers and hand-maidens of the gods. A royal dance troupe may have once lived and performed in the temple city. Facing outward from the site's outermost enclosure walls are 72 monumental *garudas*, or "guardian birdmen," carved out of sandstone. Each stands 3.25 meters tall and they are spaced 35 meters apart.

The Preah Khan Stela is one of the most important inscribed sculptural elements at Angkor. "Discovered" in 1939, it has detailed Sanskrit inscriptions about the temple city and its inhabitants and possessions. According to the stela, some 91,000 people served Preah Khan, indicating that the complex was more a town than a monastery.

When we began our project—spearheaded by British conservation architect John Sanday—Preah Khan was little more than a jumble of fallen stones and structures on the brink of collapse—the result of years of neglect, jungle vegetation encroachment, and water damage. Practically none of the original finishes and fittings remained. Eschewing major reconstruction due to the lack of historical data and the questionable philosophical nature of such an invasive approach, we chose instead to stabilize the site and preserve it as a partial ruin. We've respected the "as found" appearance of the site and its jungle setting as much as possible.

Before undertaking any stabilization work, all stones—including paving stones, lintels, vaults, and wall structures—were measured and drawn to scale as part of a survey of the "as found" conditions. The stones were referenced and number-coded to facilitate their accurate placement. By carefully studying the structures, our team was often able to replace fallen stones. In the courtyard of a new project at the nearby Buddhist temple of Ta Som, for instance, the site's all Khmer project team has pieced together several intricately carved frontons that fell from above the doors.

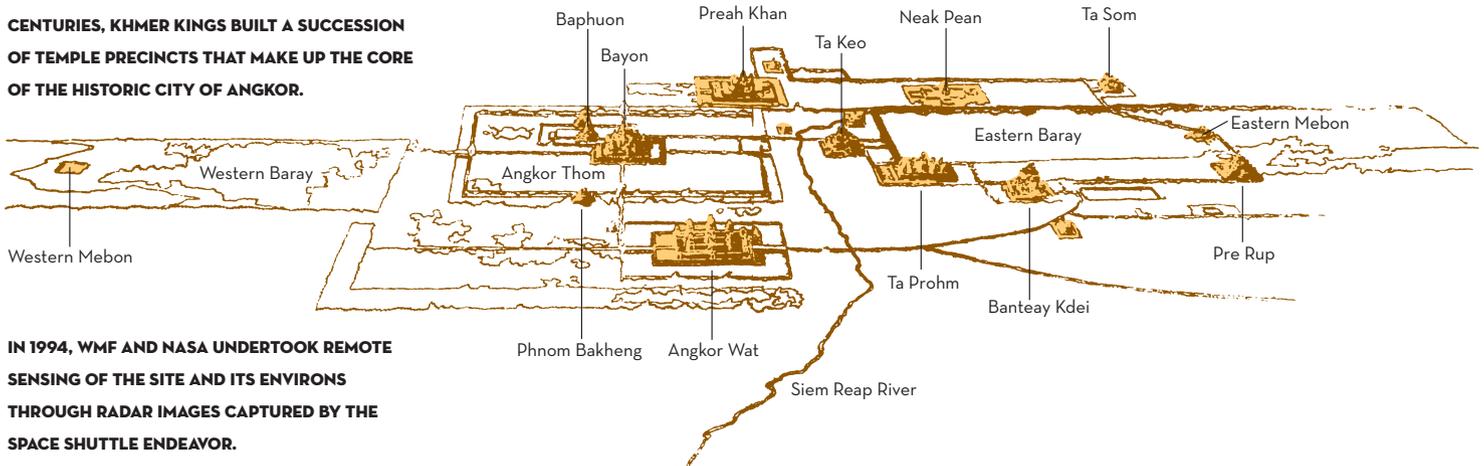
In order to keep the program simple, and more importantly, sustainable, the WMF field team has used low cost technology with a minimum of mechanical equipment to restore and maintain the temple structure. Workers use steel scaffolding as platforms along with simple block and tackle hoists and ten-ton hydraulic jacks, which they use dexterously to move the stones. The system is simplicity itself with little danger of equipment breaking down or endangering the safety of the workers.

A number of structures have been dramatically restored. When we first examined it in 1994, the



THE HEAD OF A GODDESS WITHIN ONE OF THE ANCESTRAL SHRINES AT PREAH KHAN WAS LOST TO THEFT.

FROM THE EARLY TENTH TO FOURTEENTH CENTURIES, KHMER KINGS BUILT A SUCCESSION OF TEMPLE PRECINCTS THAT MAKE UP THE CORE OF THE HISTORIC CITY OF ANGKOR.



IN 1994, WMF AND NASA UNDERTOOK REMOTE SENSING OF THE SITE AND ITS ENVIRONS THROUGH RADAR IMAGES CAPTURED BY THE SPACE SHUTTLE ENDEAVOR.





THE SACRED SWORD PAVILION HAS BEEN CLEARED OF VEGETATION TO ENHANCE ITS LEGIBILITY.

from Angkor and efforts have been made on the ground in the province of Siem Reap to deter local vandalism. WMF has recently developed a site-specific computerized inventory of architectural sculpture, using video imaging, for use at Preah Khan. However, more effective solutions need to be found to stop the unlawful export and receipt of Khmer art from Cambodia. More and more of the legacy of the ancient Khmer is literally being carted away each year.

Once we commenced full-scale conservation activities at Preah Khan in November 1993, we began to train a team of approximately 70 skilled workers in restoration crafts and conservation technology. A group of Cambodian students of architecture and archaeology assisted with the planning and supervision of work on site. Their training was overseen by project manager and architect John Sanday, and Pedrag Gavrilovic, a seismic engineer at the Institute of Earthquake and Engineering Seismology of the University of Skopje, Macedonia. The list of projects ranged in complexity from debris removal and documentation to stabilization and partial restoration of the principal East Gopura, or towered entrance gate.

Dharmasala was teetering on the brink of collapse. Its foundations had failed and were sliding outwards due to the weight of the vaulted roof. However, since it was one of few structures of its kind still standing, we decided to save as much of the original structure as possible by designing a structural support that was only minimally visible. In order to halt the tendency for the foundations to spread, two ring beams were placed on the exterior foundations to prevent slippage. The beams were linked through the wall. Rather than dismantling this structure and reconstructing it, by far the simplest approach, the team instead saved a structure unique to Preah Khan in almost its original form. At least 75 percent of the structure remains as it was found.

We also undertook extensive structural interventions in the Hall of Dancers. Here, we were able to consolidate pillars and repair three doorways leading into the hall, ensuring the hall's stability. The most significant work undertaken so far has been the repair of three fractured apsara lintels, including one which had fractured at mid-point and had been crudely supported with a concrete lintel in the 1950s. Our approach was, after careful analysis, to dismantle the lintel and the stones above and to assess the stability of the adjacent structures. Subtle intervention involved placing this special sculpted lintel back in its original position, consolidating and protecting another of Preah Khan's unique masterpieces.

The other two lintels had fallen and were only recently found in the stone rubble. Trained craftsmen under the supervision of the professional Khmer staff carried out masterful conservation and repairs of both.

Despite the enormous strides made in conservation at Preah Khan and elsewhere in Angkor, theft and vandalism remain a major concern, particularly at the more remote sites. In addition to increasing security at the site, an inventory and photographic record of all vulnerable objects at Angkor has been developed for use as a powerful tool in combating looting. The École Française d'Extrême Orient (EFEO) has compiled an extensive inventory of sculpture both at and

The Challenge of Phnom Bakheng

THE MOST ANCIENT TEMPLE IN THE HISTORIC CITY OF ANGKOR

The Hindu temple Phnom Bakheng is popular with visitors to Angkor as a spot for watching sunsets, and is particularly prized by tourists for its spectacular view of Angkor Wat, which lies some 1.5 km away. But Phnom Bakheng is also the most threatened temple in Angkor (in part because of indiscriminate climbing by tourists) and is the last of its key monuments to benefit from international aid. In December 2004, WMF and the United States Department of State announced a \$550,000 grant from the State Department to WMF for the conservation and interpretation of the site, a temple-mount at the symbolic heart of Angkor.

Built in A.D. 907 and the oldest temple within the historic city of Angkor, Phnom Bakheng was originally an oval-shaped sandstone massif 600 meters long, more than 300 meters wide, and nearly 70 meters high. The Khmer king Yasovarman I (r. 889–early tenth century) ordered the summit levelled and created terraces so that a stepped pyramid could be built. On the uppermost level of the pyramid he established a Hindu temple that became the center of his city, Yasodharapura. Dedicated to Shiva, the impressive temple structure measures 76 meters square at the base and 47 meters at the summit.

The Phnom Bakheng temple-complex is one of the most important and symbolic monuments of the tenth century. French historian Jean Laur proposed that Bakheng represents Mount Meru,

the center of the world according to Indian cosmology. A central shrine represents a polar axis and the 108 buildings that surround it evoke the cosmic revolutions around this axis. In Hindu cosmology 108 is a key number, linked to the idea of a *yuga*, or “great year,” a period of 4,320,000 human years during which a world appears, evolves, and disappears. From certain vantage points, Bakheng appears to have only 33 towers, the same number of gods who according to Indian tradition live on Mount Meru.

Phnom Bakheng is also significant for marking the beginning of a particularly refined style of Khmer sculpture. The painstakingly executed imagery of the Bakheng style seems to echo the work in precious metals that abounded in the sanctuaries. The stylized faces at Bakheng appear both spiritual and indifferent in their perfection. Peculiarly tinged as they are with a certain sense of benevolence, the sculptures are the crowning achievements of Khmer statuary.

The current WMF project at Angkor is the development of a conservation program and an interpretation scheme for Phnom Bakheng so that visitors may learn not only about the importance of the temple complex and its role in the evolution of Angkor, but about the unique flora, fauna, and landscape features at the site. Maps and other materials will contain information to orient the visitor and illustrate that Phnom Bakheng is far more than simply a place to climb to watch sunsets. —MICHAEL ELLIS



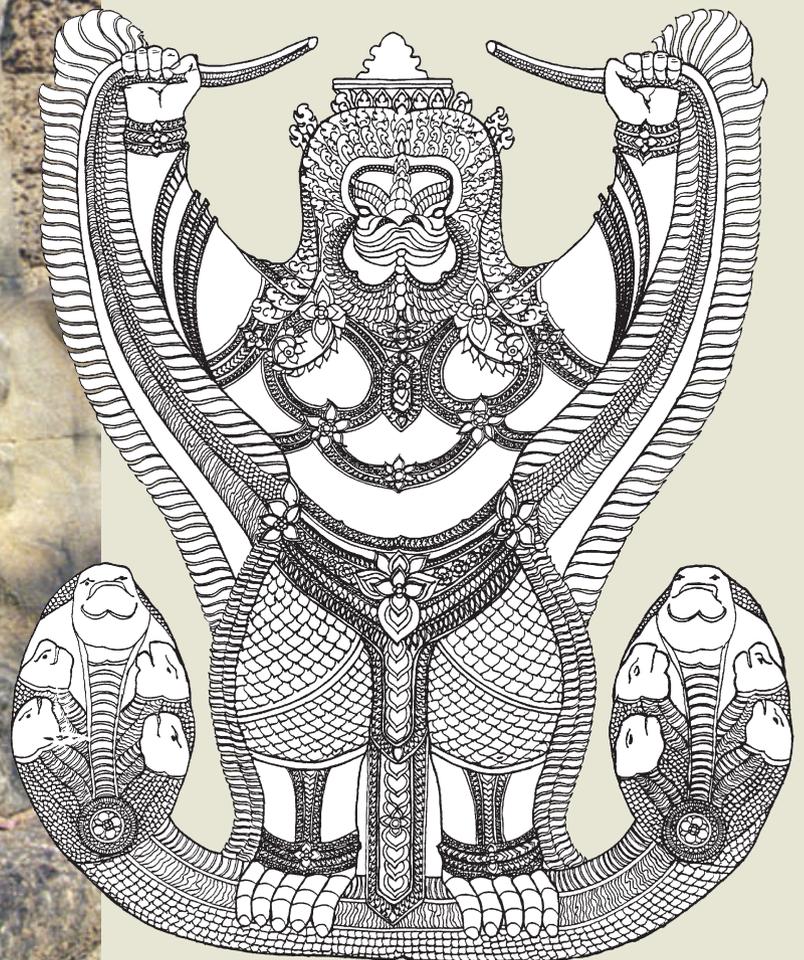
ADOPT A

Garuda

As part of its fundraising campaign to support its ongoing work at Preah Khan, WMF has initiated an "Adopt a Garuda" program to fund the restoration of the 72 monumental sandstone statues of guardian birdmen that grace the outermost enclosure wall of the temple complex. In Khmer and Hindu art, a garuda is the personal steed of the god Vishnu. Architecturally, images of the mythic beasts adorn terraces, perimeter walls, and cornices, acting as supports for the Vishnu's celestial abodes.

Exposed to the elements and engulfed in jungle for more than 500 years, the garudas are in a precarious state of preservation. Many have already collapsed and lie scattered on the ground. Others, though still standing, await a similar fate without intervention.

A contribution of \$20,000 supports the consolidation and restoration of a single statue. Once the sculpture is repaired, the balance of any adoption contribution provides for ongoing maintenance by the on-site team of conservators. Since the program was launched in 1996, 22 of the statues have been "adopted." For information on supporting this program, contact WMF's Director of Development at (646) 424-9594, wmf@wmf.org



Realizing that there is no formal training in conservation theory or technology in Cambodia, we initiated an education program at the site in March 1991. The following year 25 students from the Department of Architecture and Archaeology at Royal University of Fine Arts (RUFA) in Phnom Penh were taken to Angkor for introductory level training in the history of Angkor, the philosophy of building conservation, general survey methodologies, and archaeology. This education initiative was followed by more extensive training both at Angkor and at the University in Phnom Penh in November 1992 and March 1993.

From this group of students five architects and two archaeologists elected to join the WMF team to study heritage conservation. They were invited to spend as much time as the university would allow them working and studying in Preah Khan. For a period of five years, they dedicated at least four months a year assisting us by preparing measured surveys and records of all project areas prior to and after intervention. In recompense, the students were given on-site workshops and training in conservation technology by WMF's international consultants. The students completed their university courses, and they all received their degrees with additional certificates in architectural conservation. Most still work on different WMF programs at Angkor.

To date, the WMF Conservation Program in Angkor has trained eight Cambodian students of architecture and archaeology from RUFA. Thanks to Sanday and Gavrilovic's dedication to teaching,



STRUCTURAL REPAIRS WERE MADE TO THE EXTENDED CRUCIFORM HALL OF DANCERS, PREAH KHAN'S PRIMARY EAST-WEST AXIAL WAY, IN 1997. THE CENTER FOR KHMER STUDIES, FOUNDED BY WMF IN 1997, HAS BECOME A CENTER FOR RESEARCH IN THE ARTS AND HUMANITIES.





**THE WAT BO DANCE TROUPE PERFORMS WITHIN
PREAH KHAN'S HALL OF DANCERS, FACING PAGE.
A BAS RELIEF WITHIN A GALLERY AT ANGKOR
WAT, WHICH DEPICTS THE CHURNING OF THE SEA
OF MILK—A CREATION STORY WHEREIN VISHNU
COMMANDS DEITIES AND DEMONS TO JOIN FORCES
IN CHURNING THE COSMIC OCEAN TO RELEASE
AMRITA, THE ELIXIR OF LIFE—IS THE SUBJECT OF A
CURRENT WMF CONSERVATION STUDY.**

they are now employed by the project and are largely responsible for the on-going work. The commitment of the project's staff has made an immense contribution to the success of the project.

For 15 years work has proceeded at Preah Khan uninterrupted by political conflict. Since then, the principal East Entrance has been reopened to visitors, the Hall of Dancers has been saved from collapse, and the Dharmasala and East Gopura have been stabilized. All projects are staffed and managed by Cambodian architects, archaeologists, conservators, and workers trained in site conservation. In addition, we have built a site-interpretation center at Preah Khan and established a comprehensive maintenance program for the site.

We have met our three principal objectives—the training of a professional and administrative staff; the training of a competent work force of craftsmen, and the raising locally of sufficient revenue with its various associated programs to make Preah Khan self sufficient. Now that all the major structural repairs have been made in the most important areas of the site, the temple complex is secure from structural collapse, and the Preah Khan staff is prepared for the future of their site.

We initially set out a ten-year work plan, which was due for completion in 2000. However, thanks to the continued support of WMF's trustees and generous donors, the program in Angkor was extended for a further five years with the mission of expanding the program to new sites. In 2000, the WMF presented to the Cambodian government's Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA) an expanded program at Preah Khan. We also proposed a similar project at the nearby Buddhist temple of Ta Som, as well as a research project to study the conservation challenges presented by the *Churning of the Sea of Milk*, a bas-relief depicting Vishnu commanding deities and demons to join forces in churning the cosmic ocean to release *amrita*, the elixir of life, which adorns a gallery in Angkor Wat. At the same time, we approached the Ministry of Culture and Fine Art with the idea of developing a program with the Ministry at the remote site of Banteay Chhmar, a temple also built by King Jayavarman VII. With these new projects, we've expanded our activities to include state of the art conservation, research, documentation, and site-management techniques.

In 2005, WMF began the process of handing Preah Khan over to APSARA, which is responsible for all conservation in the archaeological park. WMF's role at Preah Khan will now involve only site interpretation such as that which we are carrying out at Phnom Bakhang, the oldest temple at Angkor (see page 37).

Our principle objective at Angkor has been to train Khmer craftsmen and professionals to conserve, protect, and present their cultural heritage. Preah Khan was once an important seat of religious learning. Six centuries after the great complex was abandoned, it has again served as a critical center for education as the descendants of Preah Khan's master builders have learned to safeguard their magnificent heritage. ■

