

**PREAH KHAN CONSERVATION PROJECT  
HISTORIC CITY OF ANGKOR**

Siem Reap, Cambodia

**REPORT II  
PROJECT IDENTIFICATION**



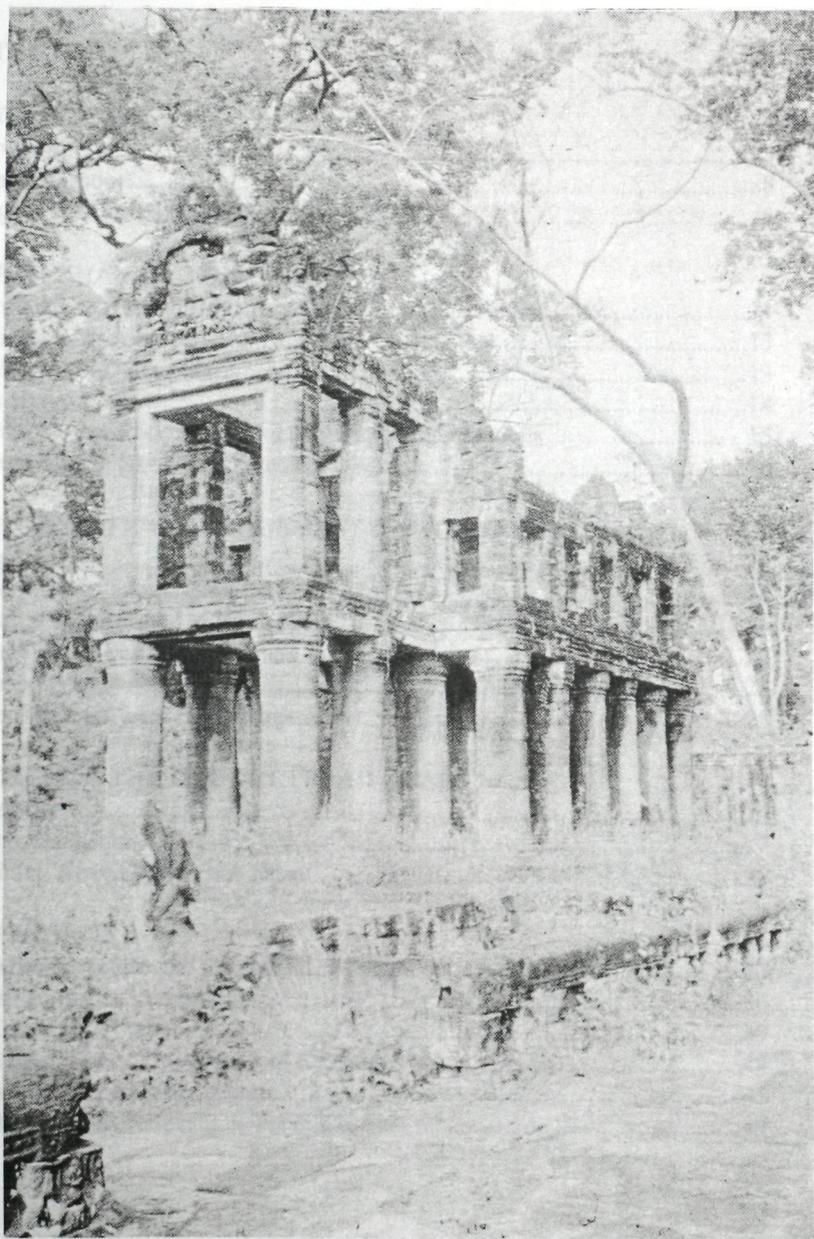
**WORLD MONUMENTS FUND**

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New York  
September 1992  
Revised



Two-Storey Pavilion, Preah Khan

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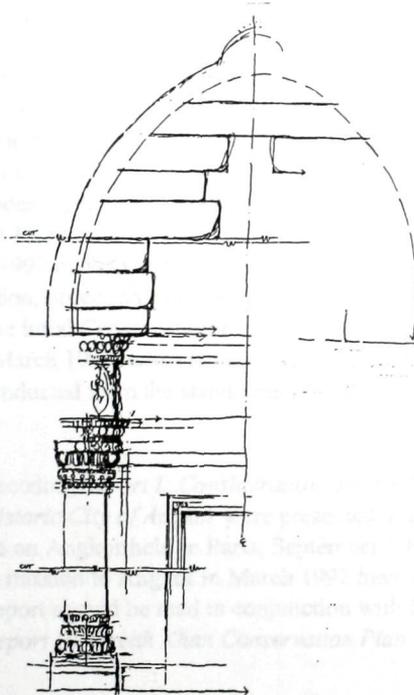
# CHAPTER 1

## INTRODUCTION

Foreword

Report Purpose

Angkor Missions 1989-1992



# 1. INTRODUCTION

## FOREWORD

Conservation of the Historic City of Angkor is considered a priority by the government of Cambodia and is a subject of concern to many other members of the international community as well. The Preah Khan religious complex is a principal site within the Parc d'Angkor complex and is being considered as the site for a pilot conservation project at Angkor sponsored by the World Monuments Fund.

The World Monuments Fund (WMF) is a not-for-profit, private organization based in New York, USA, the purpose of which is to assist in the preservation man's most significant artistic and architectural heritage. At the request of and in cooperation with the State Government of Cambodia, WMF has, since 1989, been assisting in conservation planning and training programs intended to benefit Angkor.

As a result of WMF Mission II, conducted in March 1991, the Preah Khan Conservation Project Planning Phase was initiated for the purpose of establishing inventory techniques, developing an on-site training program and preparing a preliminary project plan. WMF Mission II essentially served the purpose of *Project Identification* - or the identifying the basic physical and conceptual parameters of the conservation challenge faced today at Preah Khan. The completion of the *Preah Khan Conservation Plan* in 1992 marks the end of the initial project planning phase where issues of scope definition, procedure and cost are fully considered. The next phase of work will constitute the initial Conservation Field Campaign occurring between November 1992 and March 1993, when advanced documentation, testing, training, and site preparation are conducted from the standpoint of cost and systems feasibility analysis.

This report and the preceding *Report I: Considerations for the Conservation and Presentation of the Historic City of Angkor* were presented in draft form to the Second UNESCO Roundtable on Angkor held in Paris, September 1990. Subsequent comments and a third mission to Angkor in March 1992 have resulted in this revised report. The present report should be read in conjunction with *Report I: Angkor Considerations* and *Report III: Preah Khan Conservation Plan*.

## ACKNOWLEDGMENTS

WMF is grateful to the individuals who have served as members of its three Angkor research missions, and to the experts who have reviewed and made the suggestions for improvement of these reports. WMF hopes that, in their presently revised form, these reports will prove useful in formulating a *Conservation Plan for the Historic City of Angkor*.

Specialists who have contributed in various ways to the production of these reports include: John Sanday, Dr. Corneille Jest, Dr. Claude Jacques, Bonnie Burnham, John Stubbs, Sam Heath, Rebecca Anderson, Daniel Burke, Gini Dofflemeyer, Bruno Bruguier, Christine Hawixbrock, Dr. Frank Preusser, Fred Aldsworth, Stan Armington, Dominique Lajoux, Norma Joseph, Lori Anglin, Scott Cunliffe and Robertson Collins.

Special gratitude is expressed to WMF's hosts in Cambodia, in particular, Prime Minister Hun Sen; members of the Ministry of Culture including Minister Hang Chuon, Ouk Chea and Pich Keo; Uong Von; members of the University of Beaux Arts in Phnom Penh, including Deans Chuch Phoeurn, Hem Bun Tong and Hor Lat.

Colleagues and collaborators from other governmental organizations who have been of particular assistance include Professor Yoshiaki Ishizawa of Sophia University and his colleagues; Minja Yang, Matthais Dermitzel, Richard Englehardt and Véronique Dauge of UNESCO; and Dr. Leon Vandermeesch and Dr. Bruno Dagens of the Ecole Francaise d'Extreme Orient.

WMF's efforts have also been aided by important contributions from concerned individuals acting on their own initiative, both in Cambodia and throughout the world. WMF thanks these individuals, who are too numerous to specify, for their interest in the conserving and presenting the Historic City of Angkor.

WMF also expresses profound gratitude to its sponsors, without whose financial support these missions would not have been possible.

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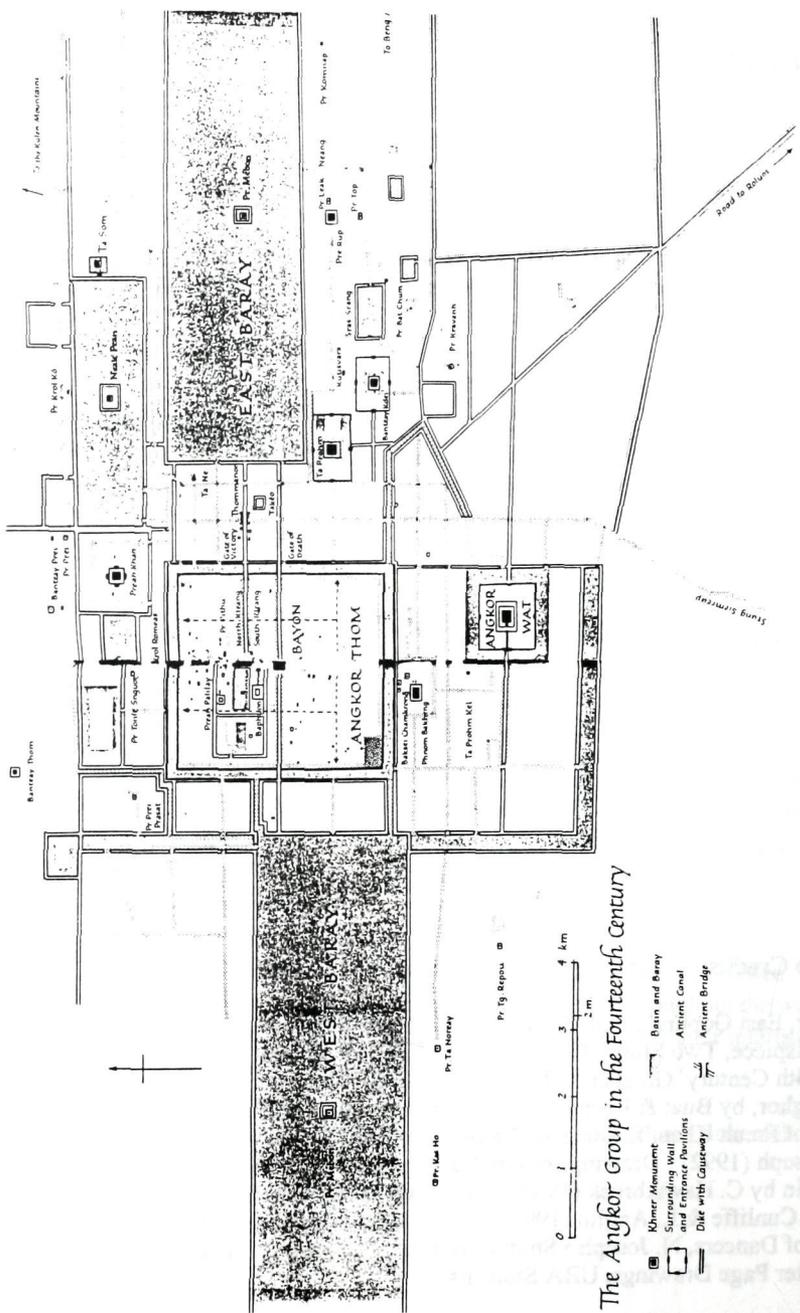
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The Angkor Group in the Fourteenth Century

- Khmer Monument
- Surrounding Wall and Entrance Pavilions
- == Dike with Causeway
- ▭ Basin and Baray
- Ancient Canal
- ▨ Ancient Bridge



## **REPORT PURPOSE**

This Report primarily summarizes the World Monuments Fund Angkor Mission of March 1991. The goals of the mission were:

- to formulate the scope and the production process for a definitive *Conservation Plan for Preah Khan*;
- to review available documentary evidence pertaining to the Preah Khan site;
- to establish a computerized inventory program for Preah Khan which could be used at other Angkor sites;
- to initiate a training program for university students in basic conservation methods, research and technology;
- to prepare a concept paper for tourism development planning in Cambodia.

## **ANGKOR MISSIONS 1989-1992**

### **General Achievements**

As of September 1992 the World Monuments Fund has initiated and supported three missions to Angkor. The following outlines the progress and accomplishments of these missions.

### **Collaboration**

- Establishment of a cooperative relationship with the Cambodian Government and with other Cambodian nationals who are interested in safeguarding the architectural heritage of the country, especially that found at the Historic City of Angkor.
- Collaboration with UNESCO and other international organizations in order to achieve consensus and formulate common approaches to solutions for the conservation challenges faced at Angkor.
- Participation in and support of international meetings to advocate and address the conservation of Angkor sites.

## **Strategy**

- Initiation of a comprehensive Conservation Plan for Preah Khan, analyzing the needs for conservation, training and presentation, and setting priorities.
- Development of an inventory and recording process for describing the architecture of Preah Khan which can also be used at other sites in the Angkor region.
- Formulation of principles and procedures for conservation work at Preah Khan which are useful at other Angkor conservation projects and elsewhere in Cambodia.

## **Training**

- Establishment of an on-site conservation training program for Cambodian university students, introducing basic techniques for research and documentation.
- Development and implementation of field exercises in drawing as a background to more complex conservation problem solving.

## **Presentation**

- Compilation of the draft *Angkor and Preah Khan Reports* for consideration at the Round Table Meeting in Paris in September 1991.
- Public display of University of Beaux Arts, Phnom Penh student drawings and photographs.

## **Promotion and Support**

- Liaison with international government and non-government organizations to establish communication with the students and faculty of the University of Beaux Arts in Phnom Penh.
- Delivery of drawing equipment and reference books to the students of the University of Beaux Arts.
- Public lectures and articles to inform professionals and the public of the conservation needs at Angkor.



## CHAPTER 2

### PREAH KHAN BACKGROUND

Introduction to Preah Khan

Religious Associations

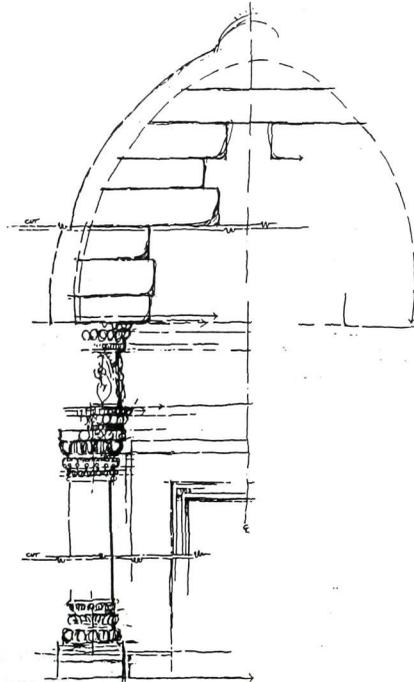
Architectural Description

Site Hydrography

Chronology of Recent Building Restoration

Interventions

Chronology of Site Development



## 2. PREAH KHAN BACKGROUND

### INTRODUCTION TO PREAH KHAN

#### Historical Sketch

The direct translation of Preah Khan is "Sacred Sword" and it is often referred to as the "Holy Palladium," the city of Jayasri (Nagara Jayasri) or "City of Royal Victory." It was built by Jayavarman VII (1181-ca. 1215) and dedicated in 1191 to his father, Dharanindravarman under the name of Lokeshvara (Jayavarmesvara).

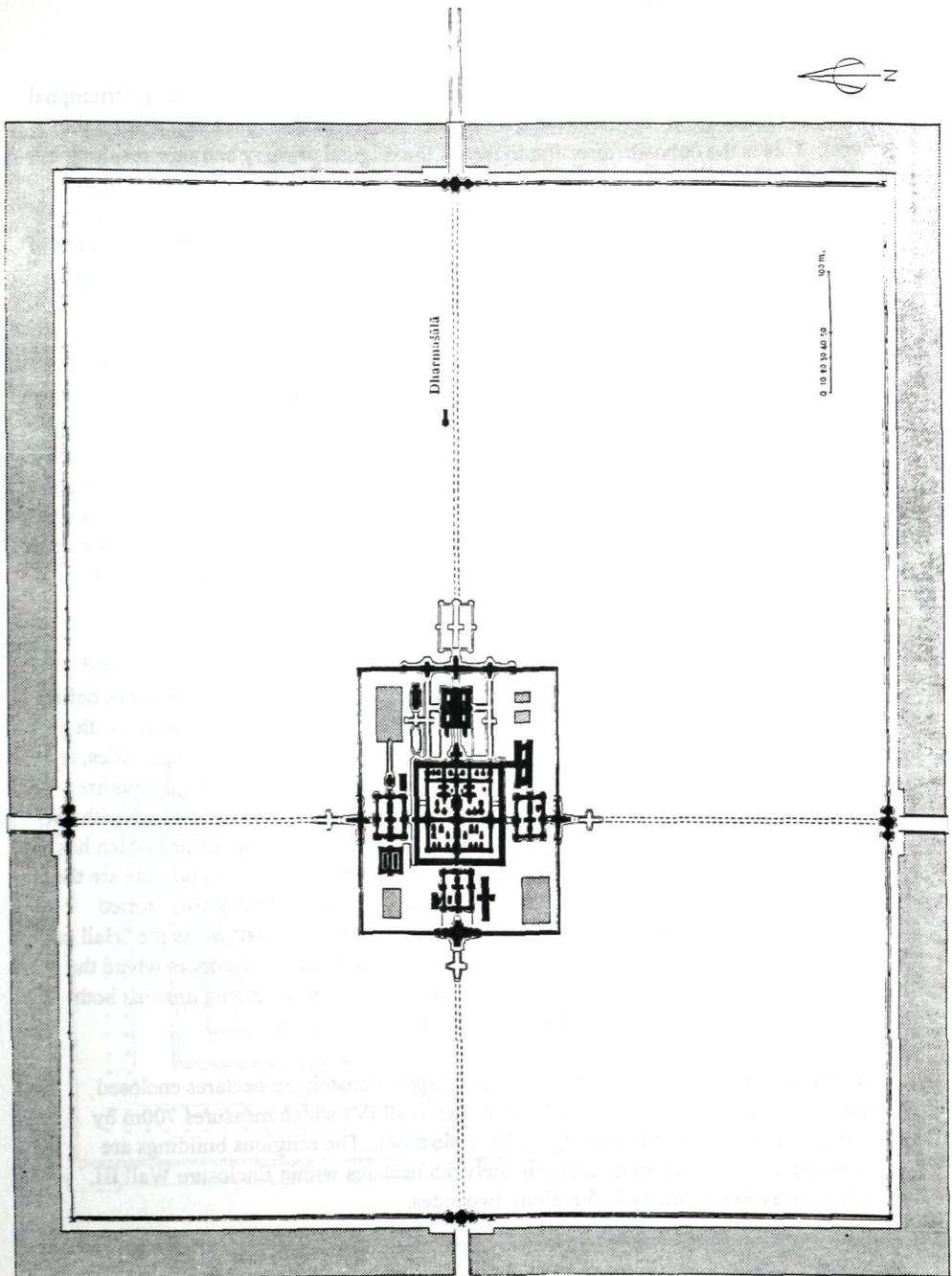
Preah Khan is one of several cities built by Jayavarman VII apparently as replacements for the royal palaces of his predecessors (Yasovarman II and Tribhuvanadityavarman). Preah Khan was built on the battlefield where the final combat between Jayavarman VII and his Cham competitors took place. Preah Khan is unique among Khmer monuments. It is described as a place of learning and its approach to religious practice is syncretic, allocating individual chapels to Buddhism, Saivism, Vaisnavism and ancestor worship.

According to the well known stele of Preah Khan dated 1191, recording the dedication of the central temple, a total of 515 divinities were installed in the temple complex. The principal divinity was Jayavarmesvara, a Lokeshvara of whose sculpted representation known today is thought to be a likeness of Jayavarman VII's father. In addition to the Vaisnavite, Saivite and Ancestor chapels, there is also record of a hospital chapel (no longer extant) and numerous other chapels, added irregularly in the central courtyard, dedicated to the memory of great dignitaries and their families. The stele records that Preah Khan was a place of learning and it lists the actual numbers (no longer legible) of teachers and students it sheltered at that time.

See also *Report I: Angkor Considerations*, Appendix A "An Overview of the History of Angkor."

#### Location and Setting

The Preah Khan site is historically linked to Neak Pean and Ta Som, forming an approximately five-kilometer east-west axis outside the north wall of Angkor Thom. Preah Khan is the main temple complex with Neak Pean at the center of the greater Preah Kahn layout. Ta Som is a smaller temple complex to the east.



Plan of Preah Khan (1966)

Plan IV. — Preah Khan d'Angkor.

The main access to Preah Khan is from the east, through a series of *gopuras* (triumphal gateways) on axis with the central main shrine. Today, access to the site is from the west. This is the opposite direction to that of the original primary entrance resulting in difficulties in interpretation for the modern visitor as to the architectural and religious concepts of the monastic complex. The present secondary entrance results from a decision made during the early part of this century by the EFEO in the establishment of routes known as the "Petit Circuit" and the "Grand Circuit" within the Parc d'Angkor linking the principal monuments of Angkor together to provide visitor access.

While the plan of Preah Khan is characteristic of a monastic complex, it has been complicated by later additions. The complex is delineated by a series of four enclosure walls, the inner two, enclosing the monastic buildings, are linked in several places and appear to be duplicative in their purpose. The moat along the west border is crossed by a causeway that is delineated by protective *nagas* leading to the central gopura. Similar causeways provide access from the north, and south, and east as well, which today are not as usable due to encroaching vegetation. The approaches to the eastern and western causeways are further identified by the remains of parallel rows of sculpted stone pillars.

Within Enclosure III, Preah Khan is a maze of chapels, courts, halls, pavilions and gopuras. Its main axis runs east-west and large gopuras with multiple entrances define the access points. The main eastern gopura is preceded by a cruciform terrace with a Naga balustrade and has three entrances. The central gate, intended for dignitaries, is larger than the two flanking gates. The northern, southern and western gopuras are designed on a smaller scale, but each is surmounted by triple-crowned towers with two circular lotus-shaped tiers. The main axes intersect at the central sanctuary which has a cruciform domed tower preceded on four sides by porticos. Of particular note are the library annexes, subsidiary temples and shrines as well as an unusual two-storied columned pavilion and a finely proportioned and decorated hall known as the "Hall of Dancers." The hall derives its name from the ornate lintels over the doors where the sculptural decoration is of very high quality, depicting rows of dancing *apsaras* both sophisticated in their style and intricately carved.

The Preah Khan complex occupies an area of approximately 56 hectares enclosed within a large outer enclosure wall (Enclosure Wall IV) which measures 700m by 880m. The wall is surrounded by a 40m wide moat. The religious buildings are densely packed in an area of approximately 3.5 hectares within Enclosure Wall III, which measures 165m by 215m along two sides.

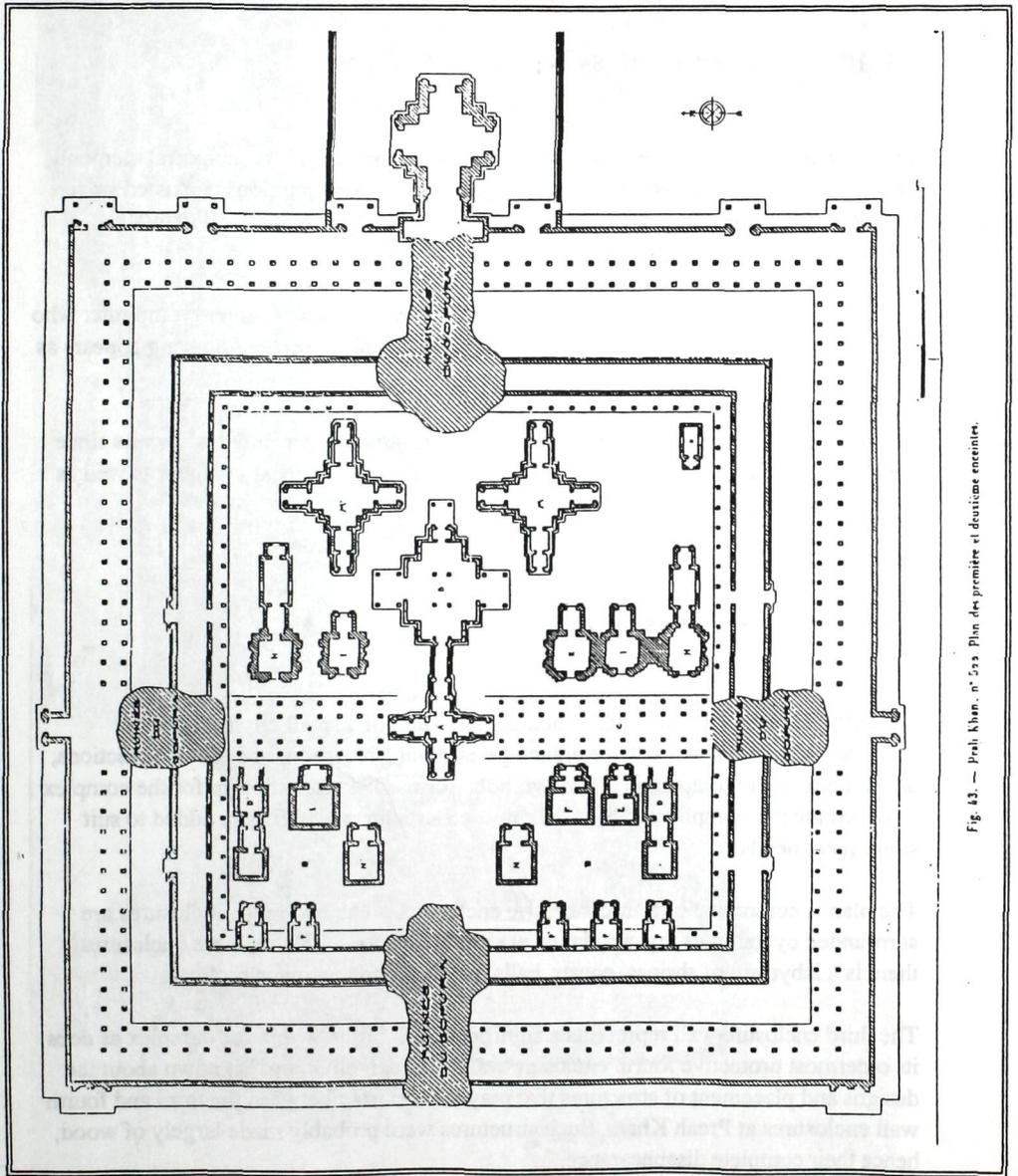


Fig. 43. — Preah Khan, n° 523. Plan des première et deuxième enceintes.

Plan of Preah Khan, Within Enclosure Wall III (1911)

## RELIGIOUS ASSOCIATIONS

Preah Khan is associated with both Buddhism and Hinduism. Its sculptural elements, pediments, statues and inscriptions shed light on how these religions coexisted since the Early Angkorian Period. Vishnu, Shiva and King Jayavarman VII's royal ancestors are all dedicated within the site.

In the Angkor Period, the King was absolute master, the lord of property, the ruler who passed all laws and declared the wars. Within the temple complex, the King appears as symbol of beauty, strength and wisdom.

Preah Khan is thought to have been occupied intermittently by Buddhist monks since the sixteenth century and today the complex is frequented by local villagers as well as national and international visitors.

## ARCHITECTURAL DESCRIPTION

The original plan of Preah Khan is analogous to that of a small city or monastic complex, with perimeter walls, entrance gates, axial circulation, nodes at intersections, and a hierarchy of architectural and symbolic forms. The early design for the complex has been greatly complicated by superimposed structures which were added to suit subsequent needs.

The plan is comprised of four concentric enclosures. The two inner enclosures are surrounded by galleries that are linked at several locations. Within these enclosures there is a labyrinth of shrines, courts, halls, pavilions and entrance porticos.

The third enclosure wall represents a significant separation within the complex as does its outermost protective fourth enclosure wall. Little, if anything, is known about the designs and placement of structures that may have existed between the third and fourth wall enclosures at Preah Khan. Such structures were probably made largely of wood, hence their complete disappearance.

Several interpretations of the plan were compiled by Ecole Francaise d'Extreme Orient (EFEO) scholars. These interpretations are addressed in *Report III: Preah Khan Conservation Plan* and elsewhere in various publications..



Inner Sanctuary, Preah Khan (1992)

1939-42 The Central Towers at the western half of Enclosure I

The architectural style of Preah Khan belongs to the period considered the height of the Classical Period at Angkor. The temple is associated stylistically with the great temple of Bayon, also a product of King Jayavarman VII's ambitious building campaign. The architecture and materials of this period are generally described in *Report I - Angkor Considerations*.

The majority of the building exteriors at Preah Khan are richly decorated in bas-relief sculpture representing features which are emblematic of the Angkorian Period of architecture. The reflection of foreign artistic influences from Indian building styles is evident in the architecture.

The main axis of Preah Khan runs east-west and is divided by large gopuras with multiple entrances. The two principal circulation and visual axes intersect at the domed, cruciform central tower accessible from each of its four side porticos. The centrally placed main temple is oriented to the east. All gopuras within the main enclosure have a similar form, but differ in scale.

## SITE HYDROGRAPHY

The architectural arrangements and iconography at Preah Khan demonstrate that water played a vital role in the spiritual life and daily culture of the ancient Khmer.

The enclosing moat is approximately 40 meters wide and is crossed by causeways bordered by Naga railings consisting of god and demon icons. The approaches to the east and west causeways are lined by carved stone pillars, representing lanterns.

Exploratory archaeological *sondages* (soundings) were taken during the WMF mission in March 1991 in order to confirm the method employed rainwater drainage systems within the first enclosure. Sampling revealed shallow exposed drainage channels, in one instance a well-formed drain was located.

## **CHRONOLOGY OF RECENT BUILDING RESTORATION INTERVENTIONS**

### **Recent Restoration Interventions**

The exploration and conservation work of Conservation d'Angkor done in conjunction with the EFEO is comprehensively documented in reports, diaries, drawings and photographs which are kept in the EFEO offices in Paris, with copies lodged in the National Museum Library in Phnom Penh. These archives indicate the precise locations where architectural conservation projects were implemented during the period between 1939 and 1956, the methods used and the work forces involved. The monthly journals prepared at Conservation d'Angkor contain the most detailed of work descriptions.

A study of the documentation housed at the EFEO was necessary to determine the extent of interventions undertaken in Preah Khan by the French scholars working with the Conservation d'Angkor in Preah Khan. Although a more detailed study of the individual structures will be necessary prior to any future interventions, an initial analysis of the monthly reports prepared by the Conservation d'Angkor reveals that since 1939, there have been two major interventions: one undertaken between 1939 and 1946, and the other between 1952 and 1956. The descriptions of these restoration campaigns only included work that had been planned, and omitted the many secondary and emergency interventions that were carried out, leaving these for inclusion in the above-mentioned site diaries.

### **Interventions Between 1927 and 1932**

The earliest organized interventions at Preah Khan, in modern times, were undertaken between 1927 and 1932 by Henri Marchal who primarily conducted a clearance of the site as well as related excavations. These, however, have only been recorded in general terms. After 1939 the interventions were more extensively documented.

### **Interventions Between 1939 and 1946**

Research activities at Preah Khan between 1939 and 1946 were undertaken under the direction of Maurice Glaise. With the exception of the period between March 1945 and January 1946 when work was suspended, the field work during the first campaign concentrated upon the main east/west axis, the north/south axis and upon structures inside Enclosure Wall I. The work program during this period can be divided into four sub-phases:

- 1939-42 The Central Tower at the western half of Enclosure I

- 1942-43 Gopuras on North/South Axis and the West Gopura of Enclosure III
- 1944-45 Western half of Enclosure I and the West Gopuras of Enclosures III and IV
- 1945-46 West Gopuras of Enclosures I and IV and the West Entrance Causeway at Enclosure IV

### **Interventions Between 1952 and 1956**

Between 1952 and 1956, research and restoration work at Preah Khan was principally under the direction of Henri Marchal and Jean Philippe Laur. After this date there were only minor interventions with passing references to the site in the monthly reports. Work was carried out practically simultaneously on different building groups, including the two-storied pavilion in the Enclosure III (1952); the South Gopura Enclosure III (1952-53) and the North Gopura Enclosure III (1952-1956). The North Cloister Enclosure III was researched and partially restored from 1954 onwards. For reference purposes, these activities can be divided into four phases:

- 1952 Two-storied Pavilion and South Gopura in Enclosure III
- 1952-53 South Gopura Enclosure III
- 1952-56 North Gopura Enclosure III
- 1954-56 North Cloister Enclosure III

### **CHRONOLOGY OF SITE DEVELOPMENT**

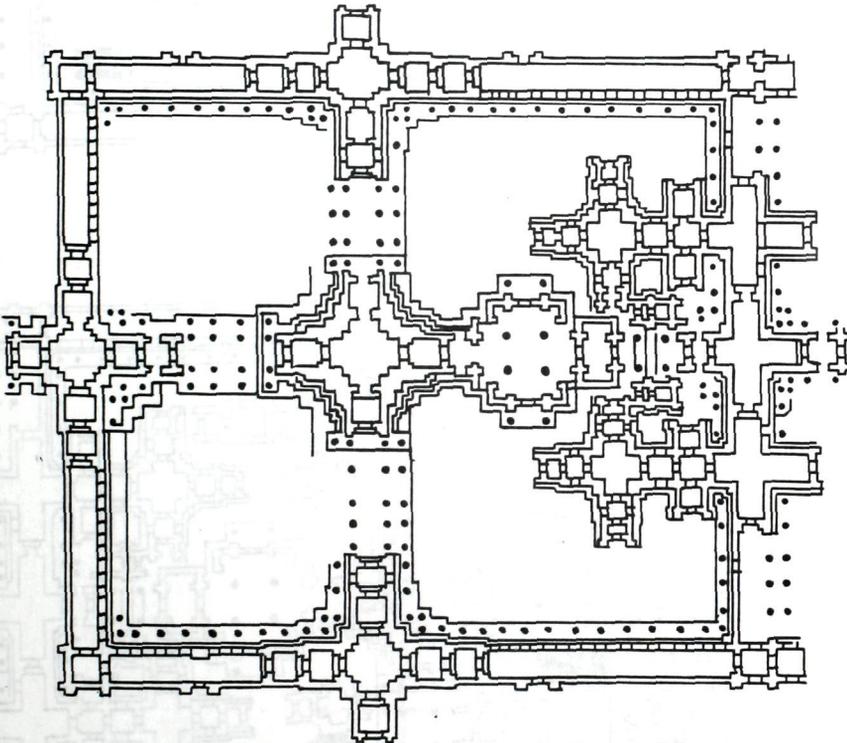
EFEO records indicate that the present Preah Khan complex was historically associated with an earlier complex. How much remains of the earlier site is not known and can only be determined by further archaeological research. The present complex was built in several stages, and evidence of this is currently being analyzed by studying:

- construction technique,
- iconographic relief and sculpture,

- inscriptions, and the
- layering and imposition of diverse architectural elements.

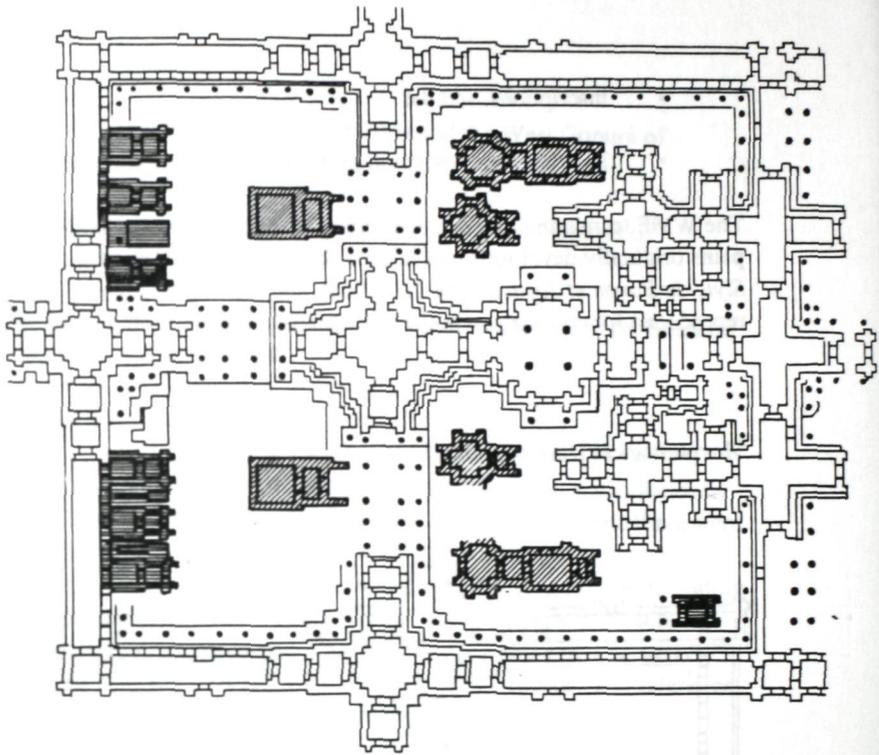
The WMF team's analysis of the building chronology is summarized on modified plans originally developed by Philippe Stern in 1965 in *Les Monuments Khmers du Style du Bayon et Jayavarman VII* (1965), and later by H. Stierlin. The plans are reproduced for comparison in the 1991 Mission Report by Bruno Bruguier.

### Morphological Development of Enclosures I & II

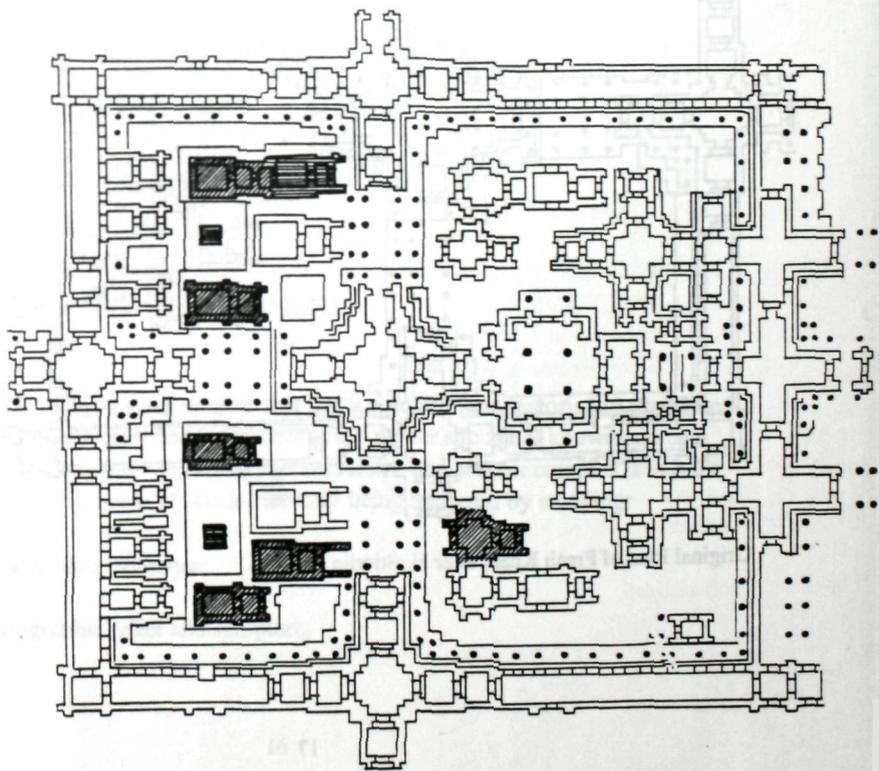


Original Plan of Preah Khan, after H. Stierlin (1970)

-  PHASE I
-  PHASE II



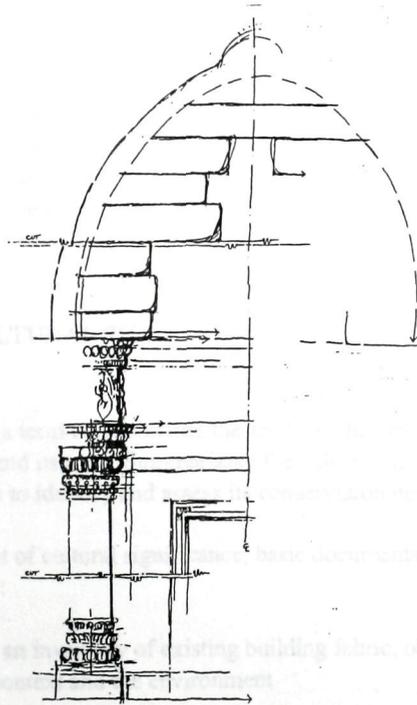
-  PHASE III
-  PHASE IV



## CHAPTER 3

### CONSERVATION MANAGEMENT PLAN PROCESS

- Purpose
- Determining Cultural Significance
- Cultural Significance of Angkor
- Conservation Policy
- Conservation Philosophy
- Plan Framework for Preah Khan



#### DETERMINING CULTURAL SIGNIFICANCE

Cultural significance is a term used to describe the social value of a place and its importance to a community. A conservation plan helps to identify and protect this value.

In preparing a statement of cultural significance, the following evidence is gathered by:

- preparing an inventory of existing building fabric, objects, as well as their physical context;
- documenting the chronology and uses of the place across time; and

### **3. CONSERVATION PLAN PROCESS**

#### **PURPOSE**

This section outlines the process suggested for use in the conservation of Preah Khan. The principles and procedures outlined in the prior *Angkor Considerations Report* provide a background to the proposed planning process.

The Conservation Plan for Preah Khan is a strategic development plan that addresses the architectural and site conservation challenges presented by Preah Khan. It represents a holistic and fully integrated application of historical, archaeological and architectural research techniques developed with a view to the site's "as found" condition. This planning process is summarized in the diagram, "Conservation Management Plan Process", on the following page.

Establishing such a framework for managing the conservation of a project as complex as Preah Khan is both a preliminary and a critical requirement. The Plan, when fully developed, reflects the decision making process and indicates how interventions can be structured by priority and undertaken in a logical and scheduled sequence. All planning decisions consider cultural significance, physical condition and the stated conservation policy of a site. Future uses and interpretation are largely dependent upon the "as found" condition of the site and the significance of its principal components.

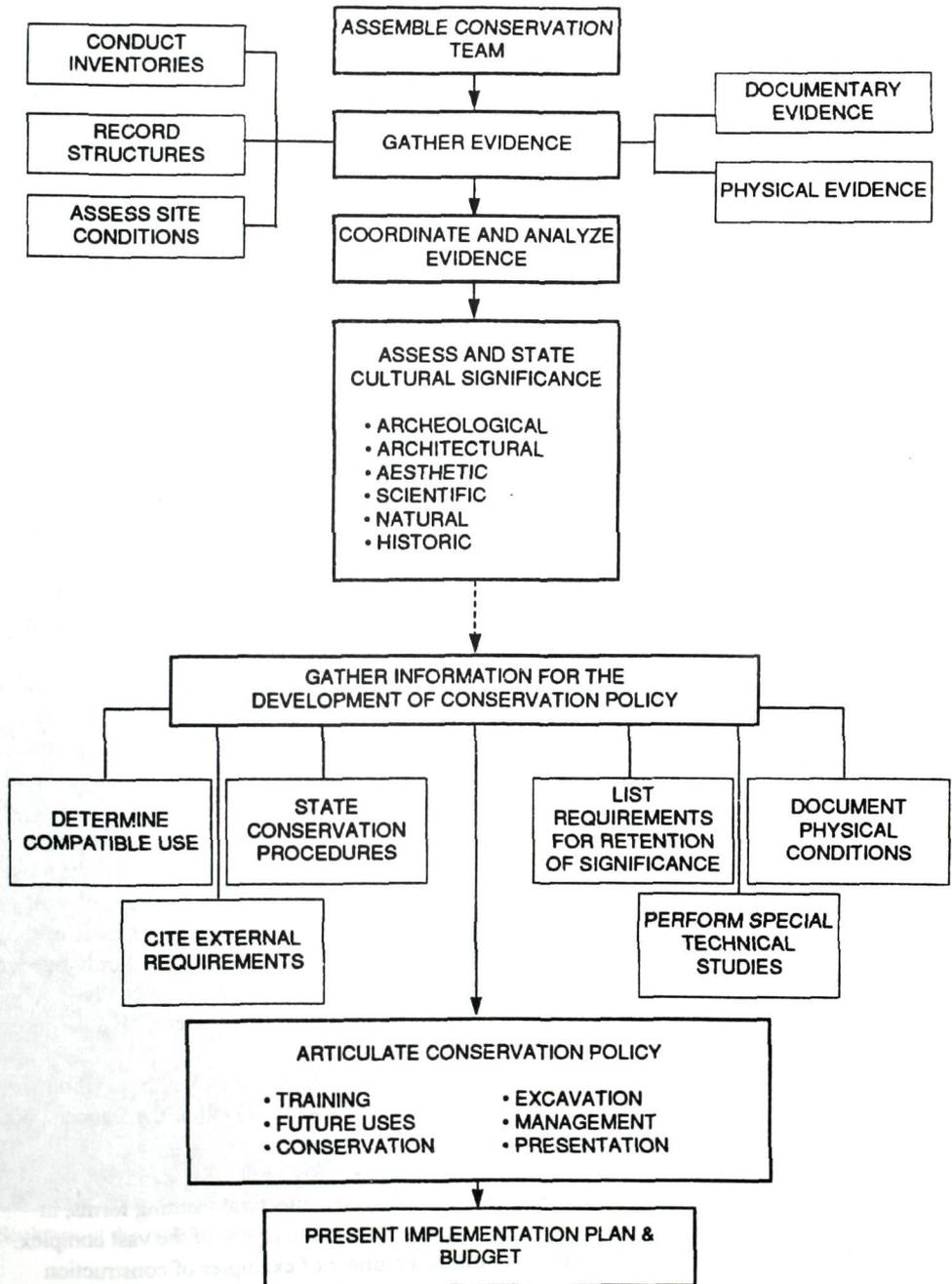
#### **DETERMINING CULTURAL SIGNIFICANCE**

Cultural significance is a term that describes the aesthetic, historical, scientific and social value of a place and its past. Summarizing the cultural significance of a site in a conservation plan helps to identify and assess its conservation needs and future use.

In preparing a statement of cultural significance, basic documentary and physical evidence is gathered by:

- preparing an inventory of existing building fabric, objects, as well as their physical context and the environment
- determining the chronology and uses of the place across time; and

# CONSERVATION MANAGEMENT PLAN DEVELOPMENT PROCESS



- summarizing the social and cultural context of the site at representative periods in its history.

Once the significance of a site is generally understood, more informed policy decisions can be made. From this, a concept of how to conserve and present the site can be devised.

## **CULTURAL SIGNIFICANCE OF PREAH KHAN**

The Historic City of Angkor is one of the most important cultural achievements of mankind. Angkor's cultural significance today is readily evidenced in its architectural and artistic remains, to say nothing of the remarkable engineering achievement of its vast hydrological works.

Covering some 160 sq. km., Angkor was the historical capital of the Khmer civilization from the eighth century to the mid-fifteenth century. The monastic complex of Preah Khan was dedicated in 1191 and represents one of the principal achievements of Jayavarman VII, who was distinguished by his large number of building accomplishments at Angkor. As the quantity and variety of his building achievements were unmatched by any of his successors, Preah Khan emerges as a product of Angkor's peak period of development.

Inscriptions on the Preah Khan stele located in the east gopura of Enclosure I reveal that the temple complex served, among other roles, an educational purpose. While the Buddhist faith is occasionally still practiced at Preah Khan, the magnificent remains of the temple complex are instructive and inspiring in other ways.

Preah Khan today can be considered an architectural pilgrimage site, among the most important within the Parc d'Angkor. Enough remains of the structures and overall plan of Preah Khan for it to be rather easily interpreted as an excellent example of the "extended linear temple" plan. In addition, Preah Khan's location on the northern edge of the Parc d'Angkor in a relatively intact natural jungle setting with a partially functioning perimeter moat system makes it a special setting for interpretive purposes.

Other distinguishing characteristics of the site include a unique two-story pavilion with round columns of an unknown original use, and the so-called Hall of the Dancers, both located in the eastern part of Enclosure III.

Preah Khan also constitutes a veritable catalogue of architectural vaulting forms, in varying sizes and conditions, all used to great effect in the layout of the vast complex. The semi-ruined state of Preah Khan offers a number of examples of construction

technologies as used by the Khmers for monumental buildings. Changes to Preah Khan over time are discernable which add to the interest of the site and also bears witness to Preah Khan's apparent long period of use, hence its cultural significance over time.



Sculpture at the Hall of Dancers, Preah Khan (1992)

## **CONSERVATION POLICY**

Conservation policy is, in general, developed in consideration of the following:

- the statement of significance,
- the conservation philosophy,
- physical condition of a site,
- available information and external requirements, as well as
- feasible use possibilities.

The conservation policy for Preah Khan will summarize:

- physical conservation action by priority,
- compatible uses,
- access and presentation,
- security measures,
- management structure,
- controls on future development,
- control of investigation and intervention, and
- procedures for policy review.

## CONSERVATION PHILOSOPHY

The corpus of general historical knowledge of Angkor and Preah Khan is considerable although there is certainly much more to learn. We know that Preah Khan was a complete, functioning religious complex. In addition, from the famous Preah Khan stele, we know that the complex also served an educational purpose. The inscriptions record important information on life at the complex, accomplishments associated with the place and unusual information on food production and consumption. In recent years, epigraphers have learned much about the religious program of the large site from dedicatory inscriptions found at door jambs where they were often made. Additional information is documented in the records of EFEO historians and archaeologists who have researched Angkor since the first decade of this century, and Preah Khan in particular since the early 1930s.

The monastic complex of Preah Khan at Angkor is an architectural ruin that, from a conservation standpoint, has reached relative equilibrium with its natural context. The remains of Preah Khan today are little more than the structural carcass of its original form. Practically none of its original finishes and fittings such as its wooden doors and interior paneling, ornamental architectural carvings and vast amount of statuary remain. Nonetheless, it can easily be imagined that, in its heyday, Preah Khan was a very impressive sight.

Judging from subsequent Khmer architecture that has survived, it is likely that certain parts of Preah Khan were richly polychromed and that metallic finishes were used in certain areas. Conservators of the site should be alert to learning as much as possible about these and other subtle issues during the next several years of research and conservation at the site.

In the current plan to conserve and present the site of Preah Khan as part of the Historic City of Angkor, a concerted effort will be made to collect all known historical information regarding the site, and to use as much of this as possible in finally deciding upon how to conserve and interpret this special place. As the site will never be in a more original state than that in which it is found today, any attempts to extend its life must be made with the utmost care and discretion using the most advanced techniques of our time. Among the basic tenets of WMF's work at Preah Khan are that:

- The remains of Preah Khan will be presented as a partial ruin and interventions will only be made to extend the life of its architectural fabric. Only a minimal amount of restoration and reconstruction will occur, and

then only when there is an absolute minimum of speculation about original appearances, builder's intentions, etc. All significant conservation decisions will be made with the consensus of the multi-disciplinary project development team.

- All conservation interventions will be designed and executed so as to be reversible, in the event that some change to the intervention is desirable at some future date.
- Use of "high tech" conservation solutions will be kept to an absolute minimum.
- Complete documentation of "as found" conditions, and all interventions will be thoroughly and clearly compiled, indexed, and filed in the project archive.
- The time-worn qualities of the site will be respected and preserved as much as possible. Only a minimal amount of stone cleaning will be performed. Where new interventions are necessary, the modern intervention will be discernable only upon close examination.
- The natural environment of Preah Khan will be respected and preserved so that it can sustain wildlife. The romantic jungle ruin aspect of the site will be preserved for purposes of interpretation, at least in certain areas.
- The archaeological context of Preah Khan will not be disturbed, except where proper archaeological excavation is conducted by qualified personnel. Special approvals and monitoring conditions will apply to all excavation work at the site.

There is much to be learned from the prior conservation efforts of the EFEO and Conservation d'Angkor at Preah Khan and elsewhere at Angkor. Due to the hiatus in site management over the past twenty years caused by civil strife, appropriate conservation methodologies at Angkor must, in effect, be "re-invented." Time has tested the various solutions used by restorers in the past. In some cases solutions worked well and in some cases they did not. All previous attempts at conservation must be well understood before any new interventions are implemented. WMF values the efforts of its predecessors at Preah Khan and, in most cases, regards the physical evidence of these efforts as worthy of preserving as part of the long history of the site.

Due to the many recent developments in documentation techniques and materials conservation technologies, an expanded array of possible solutions is now available for use in preserving and presenting Preah Khan and other sites at Angkor. All known

conservation methods, both new and traditional, are or will be considered for use in the present conservation plan, which has, as an important component, a field testing program within its project mobilization phase (Mission IV).

## PLAN FRAMEWORK FOR PREAH KAHN

The following list enumerates the principal components of the planning framework for Preah Khan.

### 1. CONTEXT

Location  
Physical Description  
History  
Conservation Background

### 2. SIGNIFICANCE OF PREAH KHAN

Aesthetic  
Architectural  
Archaeological  
Natural  
Historic

### 3. CONSERVATION GUIDELINES

Approach and Objectives  
Procedures  
Historical Research  
Archaeology  
Inventory  
Architectural  
Conservation  
Environment  
Infrastructure  
Presentation

### 4. EXTERNAL REQUIREMENTS

Legal and Planning  
Community  
Users and Visitors

### 5. ADMINISTRATION AND SUPPORT

NHPAC Purview  
Ministry Purview  
Multidisciplinary  
Project Team  
Conservation  
d'Angkor  
Research Center  
Collaborative Programs

### 6. ACTION PLAN 1991-1993

Administration  
Inventory and Planning  
Training  
Computerization  
Emergency  
Intervention  
Fundraising  
Facilities

### 7. LONG TERM STRATEGY

Conservation  
Training  
Management  
Presentation  
Infrastructure Plan  
Cultural Tourism Program  
Planning Framework  
New Development  
Approach Process

### 8. PLAN REVIEW

Review Procedures  
Participation/Representation  
Finance  
Training  
External Requirements  
Conservation Schedule  
Conservation Guidelines  
Collaborative Programs  
Maintenance Schedule

## CHAPTER 4

### 4. INITIATING THE PLAN

#### INITIATING THE PLAN AT PREAH KHAN

Following the completion of the site survey, the subsequent mission is to:

- Inventory
- Site Investigation
- Training Activities at Preah Khan

#### INVENTORY

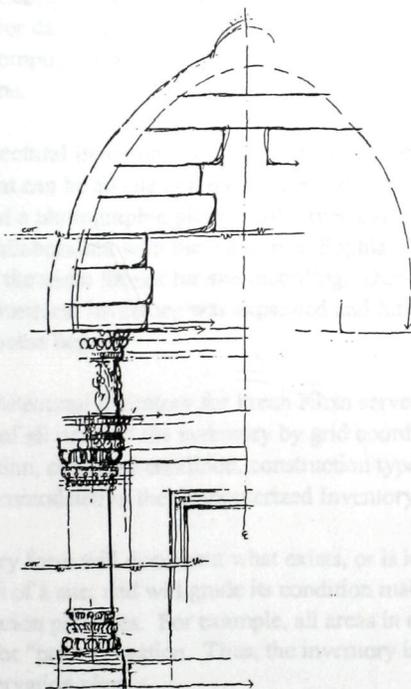
The development of a computerized architectural inventory system and the subsequent

It is planned that by using a computerized inventory system based upon a hierarchical structure, the system will be able to handle a large amount of data. The system will be able to handle a large amount of data. The system will be able to handle a large amount of data. The system will be able to handle a large amount of data.

A Computerized Architectural Inventory System (CAIS) for Preah Khan field use that can be used to inventory the original form design and construction details. Both teams have used the CAIS to inventory the original form design and construction details.

The Computerized Architectural Inventory System (CAIS) for Preah Khan serves as an index for the location of construction details. Data such as an architectural description, construction type and special artistic details can also be accommodated in the CAIS.

The completed inventory system will be used to identify what exists, or is known to have existed, in an area or component of a site. This will be done in order to make it possible to objectively set conservation priorities. For example, all areas in danger of imminent collapse will be noted for conservation. Thus, the inventory is a critical item in the development of a conservation plan.



#### 4. INITIATING THE PLAN AT PREAH KHAN

Following the completion of the Mission II the following activities were identified for the subsequent mission and serve as the action plan for 1992/93.

##### INVENTORY

The development of an architectural inventory system was begun in March 1991 by the WMF team and should be essentially completed during the 1992/93 missions.

It is planned that by using a customized database, information can be organized into a hierarchy based upon subject and importance, stored and then retrieved in a variety of ways. The system facilitates the control of archival documentation, photographic catalogues, project scheduling, financial accounting and other aspects of project management. Options for data correlation will become more diverse as the inventory records grow. As the computer program is PC based, it can be used on a variety of IBM-compatible systems.

A Computerized Architectural Inventory form has been developed specifically for Preah Khan field use that can be adapted easily for use at other similar projects. The original form design and a photographic glossary of terms and conditions were prepared by WMF in collaboration with the team from Sophia University, Tokyo. Both teams have tested the same format for site recording. During the 1992 mission, the Computerized Architectural Inventory was expanded and further tested, and the actual site inventory process begun.

The Computerized Architectural Inventory for Preah Khan serves as an index permitting the location of all items in the inventory by grid coordinates. Data such as an architectural description, structural condition, construction type and special artistic details can also be accommodated in the Computerized Inventory.

The completed inventory form will document what exists, or is known to have existed, at an area or component of a site, and will grade its condition making it possible to objectively set conservation priorities. For example, all areas in danger of imminent collapse will be noted for "priority" action. Thus, the inventory is a critical item in the development of a conservation plan.

The inventory is designed to be updated at any time and should prove to be an invaluable tool even beyond the conservation intervention phase. The Preah Khan computerized inventory is designed for easy access, modification and quantitative analysis. Certain types of information can also be depicted graphically.

## **SITE INVESTIGATION**

During the second mission several activities relating to the grounds of Preah Khan were carried out. The activities outlined below will be further developed in subsequent missions.

### **Cutting of Undergrowth**

The mature forest's encroachment upon the buildings of Preah Khan is remarkable. Large ficus trees have a gnarled and firm grasp on many of the stone structures. Few locations are without evidence of vine or root intrusion. Under WMF team supervision, Khmer workers from the Conservation d'Angkor have cleared extensive areas of undergrowth, primarily within Enclosures I and II. This has afforded access to previously impassable areas.

### **Spot Archaeological Investigations**

To verify methods of original drainage, the WMF architects and archaeologists exposed stone channels and drains revealing techniques of water collection and drainage from buildings and courtyards. During this process, with the help of Sophia University's geologist, soil strata were identified, establishing the extent of the topsoil that has accumulated over the centuries. Various stone building elements were noticed, embedded in these layers .

### **Future Site Investigations**

To date, various physical investigations at Preah Khan have revealed much new information. Continued investigations through 1993 and beyond will include:

- clearing overgrowth,
- sample archaeological tests,
- identifying archaeological strata,
- locating unrecorded structures,

- examining alterations and failures, and
- identifying and preparing project profiles.

## **TRAINING ACTIVITIES AT PREAH KHAN**

### **Initial Program Objectives**

Preah Khan Missions II and III were conceived in part to begin to train selected young Cambodians in the discipline of architectural conservation. It is hoped that some of these individuals will eventually assume the role of Angkor conservators and site managers.

### **Mission II On-Site Training Activities**

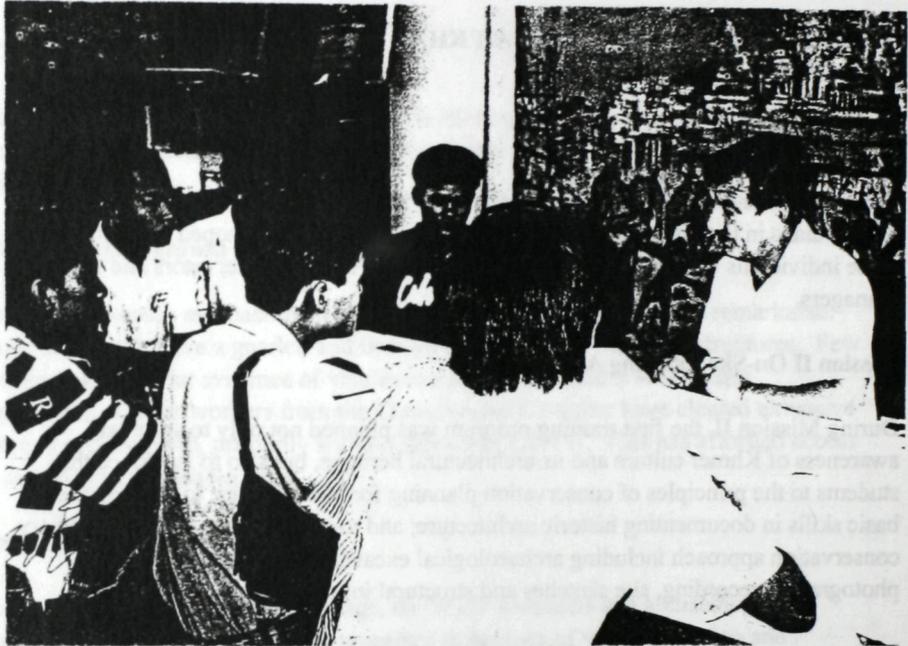
During Mission II, the first training program was planned not only to stimulate awareness of Khmer culture and its architectural heritage, but also to introduce the students to the principles of conservation planning for historic sites; to develop their basic skills in documenting historic architecture; and to introduce the multidisciplinary conservation approach including archaeological excavation, inventory methods, photographic recording, site sketches and structural investigation.

Lectures, meetings and informal discussions with a group of twenty-four trainees occurred throughout a period of fourteen days. The WMF team was responsible for the intensive training of eight people, consisting of a dean of the University of Beaux Arts, five architecture and archaeology students and two employees of Conservation d'Angkor.

The majority of training was conducted on site at Preah Khan. WMF team members each led discussions with the students on site, covering topics such as roof structures, archaeology, landscape and natural environment, spatial analysis and history.

The humid and hot weather, site facilities (or lack thereof), levels of knowledge and language abilities were important factors in the selection of an approach and schedule. The more taxing physical work would be accomplished in the cooler hours of the morning. Afternoons were often spent drawing and writing in the studio of Conservation d'Angkor. Specific studio activities included demonstrations of useful drawing techniques, the use of the computer, translating field notes and working on drawings for a proposed exhibition. Small groups of two to three students proved best suited for this task-oriented work.

The participants produced measured drawings of specific areas of the Preah Khan complex as a learning exercise. A principal objective of this exercise was to inspire participants and to cultivate their enthusiasm for conserving Angkor. After a few days, it was evident that the



Training at the Studio of Conservation d'Angkor

proposed work schedule could be accelerated and expanded to address survey issues such as spatial analysis, construction details, and inventory form completion.

The course participants agreed that as part of their training, they would prepare drawings which could be used in an exhibition on Angkor to be organized in Phnom Penh. The longitudinal plan along the east-west axis of Preah Khan was developed which demonstrated the extent and complexity of the site. The production of these drawings proved to be a valuable experience for all persons working at Preah Khan, both students and teachers alike. The quality of the drawings reflects the pride and interest the students had in the project.

Drawings and associated material prepared by the students for the exhibition are listed below:

- Site Plan of Preah Khan
- Spatial Plan: East-West Axis

- Spatial Section: East-West Axis
- Processional Plan
- Processional Elevations: North and South
- Linga Post: Plan, East Elevation and North Elevation
- Field Inventory Forms (in Khmer and English)
- Twelve Black and White Photographs (A3 format)

### **Mission III On-Site Training Activities**

Following the success of WMF's first on-site training program at Preah Khan during the March 1991 mission, a request was forwarded to the UBA through the Ministry of Culture for the same group of students to again join the WMF team in March 1992 and to continue their training. Three students from the original group were able to rejoin the mission - the original team leader and two from the Conservation d'Angkor. Four new architectural students and one new archaeological student joined the team during the second year. All students participating in the March 1992 mission stated a keen interest in completing a specialized course in architectural conservation if the University will recognize it as part of their formal training.

Although their time with WMF Mission III was limited to ten days, the students participated actively in the survey work undertaken on the East Gopura of Enclosure III, where they received instruction on measuring and drawing plans, sections and elevations of the structures as base drawings for the conservation program which is planned. The students were also instructed on the history of Preah Khan and were asked to participate in discussions on the principles and procedures for conserving Preah Khan as a partial ruin. (See "Field Documentation Systems" in the Appendix to *Report III* for a description of the methodology taught and the work undertaken.) All twenty-six students joined the WMF team for the last two days of their program after the departure of the Sophia University team during which time they were, as a group, analyzing the historical development of Preah Khan and discussing the development of an overall conservation program. The students spent one day preparing freehand sketches of various elements of the site, which have been used to illustrate this report.

### **WMF's Proposals for Assistance in Training**

**Professional Staff** A primary intention of the Preah Khan project is to assist in the training of competent administrative and technical staff to initially undertake the protection, conservation and maintenance of Preah Khan. In time these staff members can work elsewhere at the Historic City of Angkor.

**On Site Training** The future staff of the office of the Conservation d'Angkor are to be found in the Departments of Architecture and Archaeology at the University of Beaux Arts, Phnom Penh. A recent questionnaire in the Department of Architecture has identified a group of fifty students who have professed an interest in following a specialized course in Architectural Conservation. Seven students from this group have asked to participate in the Preah Khan Conservation Project. It is hoped that this student team can be assigned to the WMF project office at Conservation d'Angkor for further specialized on-site training in conservation methodology and technology.

**Formal Training Abroad for Professional Staff** After the students have completed their required university courses and two years of on-site training, it is hoped that they will be offered further specialized training courses in conservation abroad.

### **Conservation Work Force**

**On Site Training** The *Preah Khan Conservation Project* will provide good all-around site training for the conservation work force. Initially the members of the work force will need to reaffirm their former skills and regain their confidence. Later they will be trained in the latest conservation technology. It is hoped that specialist craftsmen from neighboring countries may come to provide training on site in specialized technology.

**Visiting Consultants** As part of the brief mission for all WMF consultants, they will be required to provide formal and informal training to the students and craftsmen working at Preah Khan. Each team member will be expected to participate in a course of formal lectures at the University and to carry out workshops on site with the students and/or craftsmen on research and conservation technologies.

## APPENDICES

### APPENDIX A

#### MISSION TEAMS

Following completion of the State of Cambodia, and three technical teams to assist the Cultural Ministry in the possible and to help in the Angkor

#### First Mission - 1989

Personnel The team for the conservation and the development

John Sanday, restoration

Dr. Cornelle Jost, epigraphy (CNRS)

Dominique Lajoux, epigraphy

Dr. Claude Jacquot, epigraphy

The team was augmented by

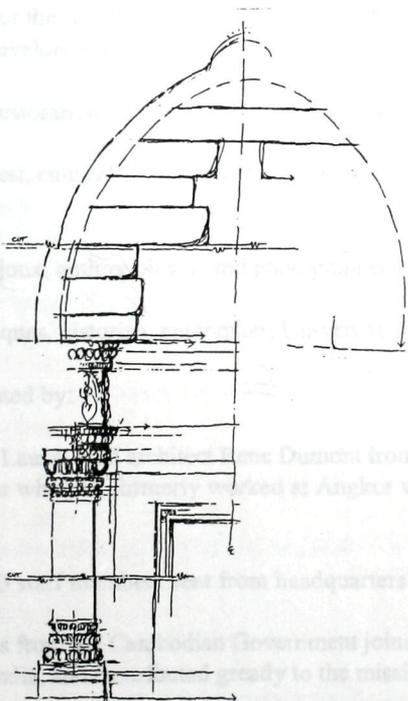
Engineer Jean-Louis Dumont from the Association des Amis d'Angkor who was already based at Angkor with the SFED in the 1960s.

Two UNESCO experts from headquarters as observers.

The following officials from the Cambodian Government joined the team while the mission was in Cambodia already to the mission's success:

Rich Kao, Assistant Director, Department of Conservation, for Historic Monuments, Museums and Tourism

- A. Mission Teams and Reports
- B. Itineraries and Programs
- C. Contacts in Cambodia
- D. Names of the Kings
- E. Architectural Nomenclature
- F. Bibliography on Preah Khan



## APPENDIX A

### MISSION TEAMS AND REPORTS

Following communications with the Ministry of Foreign Affairs, Government of the State of Cambodia and UNESCO, the World Monuments Fund has, by mid-1992, sent three technical missions to Angkor. The purpose of these missions has been both to assist the Cultural Heritage Sector of the Cambodian Government in any way possible and to help reestablish a program to conserve and present the Historic City of Angkor.

#### First Mission - 1989

**Personnel** The team for the first mission consisted of specialists in architectural conservation and the development of cultural heritage sites:

- John Sanday, restoration architect - Consultant to World Monuments Fund
- Dr. Comeille Jest, cultural adviser; Centre National de Recherche Scientifique (CNRS)
- Dominique Lajoux, anthropologist and photographer (CNRS)
- Dr. Claude Jacques, historian, epigrapher; University of Paris

The team was augmented by:

- Engineer Jean Launay and architect Rene Dumont from the Association des Amis d'Angkor who had formerly worked at Angkor with the EFEO in the 1960s.
- Two UNESCO staff members sent from headquarters as observers.

The following officials from the Cambodian Government joined the team while the mission was in Cambodia, and contributed greatly to the mission's success:

- Pich Keo, Assistant Director, Department of Conservation, for Historic Monuments, Museums and Tourism

- Seung Kong, Director of the Bureau of Foreign Affairs

The staff at World Monuments Fund headquarters was actively involved in providing the essential administrative support and research assistance in the preparation of the draft Mission Report, 1990 - *The Conservation and Presentation of the Angkor Sanctuary, Cambodia*.

## **Second Mission - 1991**

**Personnel** The World Monuments Fund's second mission was in collaboration with Sophia University, Tokyo. WMF expanded its team to include the following team members:

- Robertson Collins - Pacific Asia Tourist Association - Cultural Tourism Division
- Lori Anglin, Scott Cunliffe - Cultural Management Consultants
- Bruno Bruguier and Christine Hawixbrock - EFEO
- Véronique Dauge - UNESCO Headquarters
- John Sanday, consultant to World Monuments Fund, who led the team with Corneille Jest, CNRS, assistant coordinator.

Professor Yoshiaki Ishizawa led the team from Sophia University which provided specialists in architectural history, geology, botany and archaeology.

**Project Reports** Arising from the second mission, the following documents were compiled:

- Anglin, Cunliffe - *Preah Khan Mission Report: Inventory and Training*.
- Collins - *Cultural Tourism Concept Paper* (summarized in *Angkor Considerations Report*).
- Bruguier - *Preah Khan, Rapport de la Mission*.
- Hawixbrock - *Preah Khan, Rapport d'Activité*.

These documents are on file at the World Monuments Fund headquarters in New York, USA.

## **APPENDIX B**

### **ITINERARIES AND PROGRAMS**

#### **First Mission - December 1989**

The mission was fortunate in having the opportunity to visit twenty-four of the major sites at the Historic City of Angkor. The mission was also able to visit the Khmer sites of Prasat Neang Kmau in the vicinity of the present capital Phnom Penh and Udong, the former capital. After leaving Cambodia some members of the team visited several Khmer sites near Surin in the Northeast Thailand which served as a basis for valuable comparisons, especially since several sites, such as Phnom Rung, had been recently restored. The group also visited Ayuthia, the former capital of Thailand. Each of these sites provided insight into the potential threats posed by the development of tourism to significant archaeological sites in the region.

The following was the First Mission's itinerary:

#### **1st December 1989 - Friday**

- Site visit to the Genocide Museum in Phnom Penh
- Meeting with Mr. Sok An, the Vice Minister for Foreign Affairs.
- Visit to the Museum of Art and Archaeology.
- Meeting with Minister of Information and Culture, Mr. Chen Peong and the Vice Minister in charge of Museums, Mr. Chey So Phea.

#### **2nd December 1989 - Saturday**

- Leave Phnom Penh by air for Siem Riep/Angkor
- Site visit to Baphuon
- Site visit to Angkor Wat

#### **3rd December 1989 - Sunday**

- Site visit to the Roluos group of monuments - Pra Ko Temple - Bakong temple complex - Lolei complex
- Second site visit to Baphuon

4th December 1989 - Monday

- Third site visit to Baphuon with the French team
- Site visit to the Royal Palace enclosure at Phimeanakas
- Site visit to Thommanon and Chausay Tevada
- Site visit to Ta Prohm
- Site visit to Wat Athva, south of Siem Riep

5th December 1989 - Tuesday

- Site visit to Prasat Kravan
- Site visit to Bat Chum
- Site visit Banteay Kdei
- Site visit to Pre Rup

6th December 1989 - Wednesday

- Site visit to Preah Khan (Angkor)
- Second site visit to Angkor Wat

7th December 1989 - Thursday

- Site visit to East Mebon - Eastern Baray
- Site visit Takeo
- Site visit to Bayon
- Meeting with Indian team at Conservation d'Angkor

8th December 1989 - Friday

- Site visit to Baksei Chamrong
- Second visit to Preah Khan
- Third visit to Angkor Wat
- Meet the Indian team

9th December 1989 - Saturday

- Meeting with the staff of Conservation d'Angkor
- Site visit to the Terrace des Elephants
- Afternoon return by air to Phnom Penh

10th December 1989 - Sunday

- Site visit to Prasat Neang Kmou (north Phnom Penh)
- Site visit to Ta Prohm, Bati
- Lunch with the Minister of Culture, Mr. Chen Peong
- Meeting Vice Minister Foreign Affairs, Mr. Sok An

11th December 1989 - Monday

- Meeting with the Minister of Culture and visit to the University of Beaux Arts for a cultural performance
- Meeting at the National Library with Judy Ledgerwood, Library Conservation Program - (Cornell University)
- Group discussion with the Vice Minister of Culture, the Vice Minister of Foreign Affairs and members from the Departments of Architecture, Archaeology, Museums and Conservation.

12th December 1989 - Tuesday

- Site visit to former capital of Cambodia, Udong
- Meeting with His Excellency, the Ambassador from Poland

13th December 1989 - Wednesday

- Meeting with the Honorable Prime Minister Hun Sen and members of the Prime Minister's cabinet
- Site visit to the Royal Palace in Phnom Penh
- Second meeting with the National Museum to study documentation on Angkor
- Meeting at the Faculties of Architecture and Archaeology. Student presentation
- Friendship dinner with the Minister of Culture, Mr Chen Peong and various members of the Ministries of Culture, Education and Foreign Affairs

The itinerary in Thailand was as follows:

15th December 1989 - Friday

- Meeting at the UNESCO Regional Office, Bangkok, with members of UNESCO staff and Japanese delegation from Sofia University to discuss the proposed forthcoming Angkor Round Table Meeting.

17th December 1989 - Sunday

- Site visit to the ancient capital of Ayuthia

19th December 1989 - Tuesday

- Site visit to Phnomrung Buriram with Director of Archaeology, Dr. Nikom Musikgama
- Site visit to Muang Tam, Buriram with the Director of Archaeology, Dr. Nikom Musikgama.

20th December 1989 - Wednesday

- Site visit to several of the smaller Khmer sites located close to Surin

## Second Mission - March 1991

### Joint Sophia/WMF Mission

As it was the purpose of the second mission, conducted between March 8th - 30th 1991, to determine the parameters for the Preah Khan pilot conservation project, the temple site was the focus of activities. This second mission was project specific and its activities were centered upon beginning an inventory of the site and facilitating training sessions. Training of the university students was undertaken in collaboration with the Sophia team.

A summary of the Sophia/WMF cooperative initiatives is found in Section 4 of this Report, "Initiating the Plan."

## APPENDIX C

### CONTACTS IN CAMBODIA

#### First Mission

During the first mission, extensive contact was made with members of the Cambodian Government, both on-site at Angkor as well as in the various ministry offices in Phnom Penh. Prime Minister Hun Sen was especially interested in the outcome of the first mission and a meeting was arranged to enable the team to brief him on their findings. Meetings were also held in the presence of the Minister of Culture and Information, Chen Peong; the mission's host, Vice Minister for Foreign Affairs, Sok An as well as with the members of the Ministry of Education.

The team was accompanied at all times during both missions by members of the Department of Conservation who assisted with their historical and technical knowledge of the Khmer sites in Cambodia. The following is a list of the people with whom the WMF team met during the first mission.

The President of the Council of Ministers	Prime Minister Hun Sen
Cabinet of the President - Council of Ministers	Vice Minister Cham Prasat
Ministry of Foreign Affairs	Vice Minister Sok An
President of UNESCO National Commission	Vice Minister Long Visalo
Ministry of Information and Culture	Minister Chen Peong Secretary Tu Koeun
- Department of Conservation and Historic Monuments	Vice Minister Chey Sophea Director Ouk Chea
- Conservation d'Angkor	Director Um Vong
- National Museum Phnom Penh	Director Ouk Sun Heng
Ministry of Education	Vice Minister Mon Chim Huy Secretary Im Sethy
- Department of External Relations	Director Seung Kong

The University of Beaux Arts Phnom Penh

- Dean of Faculty of Archaeology
- Dean of Faculty of Architecture
- Dean of Faculty of Plastic Art

Chuch Poern  
Hor Lat  
Hem Bun Tong

Province of Siem Reap

Governor Leng Vy

## **Second Mission**

During the second mission, the Mission had initial discussions with its host, the Vice Minister for Foreign Affairs, Mr. Sok An; and with the Minister of Culture and Information as well as the Director of Conservation, Mr. Ouk Chea and his staff in Phnom Penh and in Siem Reap. The mission also met with faculty members from the University of Beaux Arts, including Prof. Hor Lat, (Architecture); Prof. Couch Phoeurn (Archaeology); and Prof. Hem Bun Tong (Plastic Arts). Mr. Richard Engelhart, UNESCO Liason Officer in Cambodia was present in Siem Reap and Phnom Penh for the duration of the mission.

Discussions were held formally and informally with the following members of the Cambodian Government:

Sok An, Vice Minister, Ministry of Foreign Affairs

Hor Nam Bora, Chief EEC Division

Tan Vun Yaung, Department of Europe

Hang Chuon, Minister, Ministry of Information and Culture

Ouk Chea, Director, Department of Conservation

Ouk Chan, Deputy Director, Department of Conservation

Pich Keo, Assistant Director, Department of Conservation

Udang Von, Conservator, Conservation d'Angkor

Leng Vy, Governor, Province of Siem Reap

## List of Faculty

The following members of faculty actively participated in the training sessions and contributed to the development of the research and analysis for this report.

Chuch Poern, Dean of Archaeology

Hor Lat, Dean of Architecture

Hem Bun Tong, Dean of Plastic Arts

Kun Sorith, Department of Architecture

## List of Students - General Training Program

The following students participated in the collaborative WMF and Sophia University on-site training program in Angkor:

### Department of Archaeology

Long Bunnasiriwath

Ly Vanna

Chan Bhakti

Ky Yalip

Kim Suthin

Nuon Nareth

Seng Soth

Vann Narith

Chhan Chamroen

### Department of Architecture

Meng Heang

Chap Rathmony

Nou Stasatya

Chhom Setha

Chea Chanathbras

Chay Praing Souann

Nang Soth Samphear

Prak Bothavie

Bun Ly

Chamrrun Katika

Lek Sareth

Sy Rathmony

Tith Khemara

En Sarin

### **List of Students - Preah Khan Team**

The following students worked with the World Monuments Fund team to prepare information on the 1991 Preah Khan Report:

Vong Sareth, Conservation d'Angkor  
Kong Sam Sera, Conservation d'Angkor  
Lek Sareth, Department of Architecture  
Sy Rathmony, Department of Architecture  
Tith Khemara, Department of Architecture  
En Sarin, Department of Architecture  
Chan Chamroen, Department of Architecture

## APPENDIX D

### TRANSLATIONS OF THE NAMES OF KINGS AT ANGKOR

Bhadravarman	"The man protected by luck"
Bhavavarman	"The man protected by Bhava" (literally "the life," another name for Siva)
Dharanindravarman	"The man protected by Indra (the lord) of the earth (dharani)"
Harivarman	"The man protected by Hari (literally "the wild beast," another name for Indra or Vishnu)
Harshavarman	"The man protected by luck"
Indravarman	"The man protected by Indra"
Jayavarman	"The man protected by victory"
Mahendravarma	"The man protected by the great (maha) Indra"
Narasimhavarman	"The man protected by the Man (nara) lion (simha)," another name for Vishnu
Rajendravarman	"The man protected by king (raja) Indra"
Rudravarman	"The man protected by Rudra (i.e. The Terrible," a name of Siva)
Sambhuvarman	"The man protected by Sambhu," a name for Siva, Vishnu, Indra and Brahma
Suryavarman	"The man protected by Surya (sun)"
Udayadityavarman	"The man protected by the rising (udaya) sun (aditya)"

## APPENDIX E

### ARCHITECTURAL NOMENCLATURE

The following is a list of the principal terms referred to in the various architectural descriptions of Preah Khan:

*Apsaras*: Celestial dancers who entertain the gods and are the sensual rewards of kings and heroes who die bravely. In Khmer mythology they were elevated alone to special importance in temple decoration.

*Baluster*: A circular post or pillar, used in a barred window or as the upright of a balustrade.

*Baray*: An artificial lake or reservoir.

*Bas Relief*: The exteriors of many sandstone structures were decorated with bas reliefs of symbolic *Devatas*, *Apsaras*, and *Kudu* (false windows). It was normal for such structures to be built from roughly dressed stone blocks that, once in place, were carved in bas relief. It is for this reason that the stone colors and textures sometimes vary between individual sculptures and that works of art such as the devata are not part of a logical layout of stone blocks.

*Causeway*: The grand access route built out of laterite and sandstone that crosses the moat at the North, South, East and West entrances. The causeway is paved with stone slabs and the balustrades are Nagas held by Devas and Asuras in the "churning of the sea of milk" attitude.

*Cell*: A small enclosed space often attached to a larger structure and housing a divinity.

*Chapel*: A small single structure with an east facing vestibule. A chapel may house a personal divinity and often has an inscription on the right hand door jamb identifying the donor of the structure and/or the divinity being honored.

*Colonette*: A small, usually decorative column in Khmer architecture which stands at either side of a doorway.

*Composite Vault*: A single span vault consisting of a high vault of exposed

stone corbelling springing from dressed and decorated vault segments. Such vaults as found at Preah Khan are of later construction and were created in order to raise corridor heights. Also called a *cloister vault*.

*Corbel*: A deeply embedded load-bearing stone projecting from a wall.

*Corbelled Arch*, or , *Corbel Arch*: A false arch formed by stones projecting approximately one third of their length from opposite walls.

*Corridor*: An enclosed passageway linking two spaces together. The corridors at Preah Khan are axial with the loftiest being of the composite vault type.

*Coursed Stonework*: Stone blocks laid in consistent horizontal courses as often seen in the use of laterite stone construction.

*Crude Vault*: A corbelled vault created with rough hewn or undressed stones. These vaults were most likely hidden above panelled wooden ceilings.

*Dressed Vault*: A semicircular or quarter vault created with a smooth or decorated finish intended to be visible. The remains of quarter or side vaults at Preah Khan are often inscribed with circular motifs and show evidence of painted finishes.

*Dvarapala*: A temple guardian, normally sculpted as a watchman at a door.

*Enclosure Wall*: Walls which define the perimeter of various parts of the complex. Preah Khan is divided by four concentric enclosures. The outermost Enclosure Wall IV defines the limitations of the extended precinct of Preah Khan and encloses an area of approximately 56 hectares. Enclosure Wall III delineates an area of approximately 6 hectares which contains the religious buildings. Enclosure Wall II represents an alteration during the first reconstruction phase (1192?) which created a circumambulatory around Enclosure Wall I. The perimeter wall of the central Buddhist group of temples and shrines forms Enclosure Wall I, which has, on its inner face, an additional circumambulatory passage.

*Fronton*: The triangular vertical face used decoratively above a lintel or over a portico or other entrance.

*Gallery*: A colonnaded open space, often covered by side vaults forming an enclosure wall or a gopura complex. See also *Hall*.

*Garuda*: A mythical bird-man, the vehicle of Vishnu.

*Gopura*: A gateway. Generally refers to the large processional gateways passing through enclosure walls. There are usually three access points through a gopura, the main central passageway and two flanking gates. Guardian divinities were placed in the central space and the exterior openings are generally flanked by over life size guardian sculptures.

*Hall*: A large open space usually colonnaded and roofed with a *composite vault*. Preah Khan's "Hall of Dancers" is an example, named because of the finely carved long span lintels depicting dancing *apsaras* over the four main doors. Halls are always located on principal axes and are usually adjacent to entrances.

*Keyed Stonework*: Keyed stonework is a distinctive sandstone wall construction at Angkor. Laid with no mortar, each stone is carefully dressed to fit adjacent stones. In long stretches of wall, stone joints will sometimes be closed and locked together by a wedge shaped key stone or tie.

*Laterite*: A red, porous, iron-bearing rock that is easy to quarry but hard when dried.

*Library (Bibliotheque)*: A single vaulted structure often adjacent to the main axial passageway and oriented towards the main temple within a religious complex. They are often high vaulted structures with a ventilation port. It has been suggested that these structures were probably small shrines used to house the sacred flame (*Agni Sala*) and not necessarily as repositories for written records.

*Linga*: The stylized image of a phallus, representing the essence of the god Siva.

*Lintel*: A load-bearing or decorative block spanning a doorway across the two pillars.

*Naga*: A many-headed serpent with numerous mythological connections associated with water, fertility, rainbows and creatin.

*Pavilion*: A single large structure of distinct form, usually physically independent of other structures. The two storied pavilion in the northeast quadrant of Preah Khan is a unique example.

*Pilaster*: A pillar with square or rectangular sections that is actually engaged in the wall so that it becomes a projection.

*Portico*: A roofed space, open on three sides, providing access to an entrance, as in a gopura.

*Processional Posts*: Carved stone stelae forming the processional entrance to a causeway. Part of a formal approach to principal entrances at Preah Khan there are two rows of two meter high sandstone posts which are symbolic of lanterns. They are carved with *garuda* motives at the lower portion and had Buddhist images above. At Preah Khan these Buddhist images were defaced at the beginning of the 13th century.

*Quincunx*: An arrangement of five things in which four occupy the corners and the fifth the center.

*Scribed Walls*: After walls, windows and doors were constructed, the rooms of shrines or temples were sometimes decorated by inscribing patterns of floral or vegetal designs, or sometimes, even images of divinities. Jambs to doors and windows are often decorated in a similar way.

*Stele*: An upright slab bearing an inscription.

*Tank*: A large open pool, often lined with dressed stone to collect and contain water within the confines of the temple complex.

*Terrace*: A raised platform in stone often used as part of the entrance sequence to a temple building. At Preah Khan terraces bordered with balustrades using the Naga motif are encountered as one approaches the temple from the north, south, east and west. Accessible from below by a broad staircase, the raised level indicates the beginning of the religious zone of the complex.

*Vault*: An arch extended in depth. A structurally functional arched ceiling and/or a roof in stone. Vault construction at Angkor is of the corbelled type.

*Vestibule*: An enclosed space with raised thresholds on axis with a principal shrine. Often on the left side door jamb, on entering a vestibule, there will be an inscription of authorship and dedication.

## APPENDIX F

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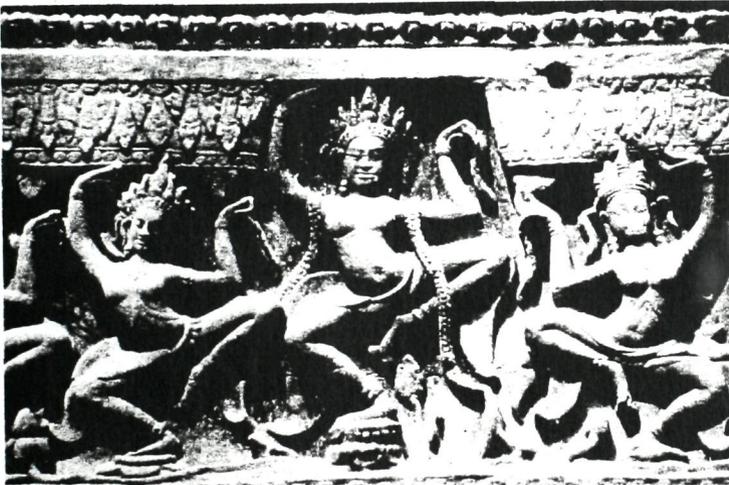
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Lintel Carving, Apsara Motif at Preah Khan (1992)