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Comité International de coordination pour la sauvegarde et le développement du site historique d'Angkor
International Co-ordinating Committee for the Safeguard and Development of the Historic Site of Angkor

ANGLAIS

COMITE TECHNIQUE

TECHNICAL COMMITTEE

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DEPARTMENT OF FOREIGN AFFAIRS
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PHNOM PENH - 31 MARCH 1998 - COUNCIL OF MINISTERS
 PHNOM PENH - 31 MARCH 1998 - COUNCIL OF MINISTERS

INTRODUCTION

The Third meeting of the **Technical Committee** created by the **International Co-ordinating Committee for the Safeguard and the Development of the Historic Site of Angkor**, co-chaired by France and Japan, and for which UNESCO ensures the secretariat, was held in Phnom Penh on 31 March 1995.

This event, attended by 23 countries and international, including 6 non governmental organizations, is significant of the importance given by the international community to the safeguarding, the protection and the conservation of this monumental site as well as the development of the region and the presentation of its historic and cultural treasures .

The Technical Committee was informed of the work of the Plenary Session of the International Co-ordinating Committee, 2 December 1994.

HE Mr Vann Molyvann presented the various measures taken during the first quarter of 1995, related to the preparatory phase of the Plan of Emergency for Angkor Region and; adopted by the Royal Government. He underlined in particular those related to the reinforcement of the institutional framework for the management of Angkor.

In this respect, the Committee expressed several recommendations concerning the actions to be undertaken for the next WHC in Berlin, for an effective implementation of APSARA, and concerning Heritage Police Unit and the pursuit of the demining activities in the Angkor sites.

The Committee examined the follow-up to on-going activities and studies, executed in the framework of the different sectors of the Emergency Plan. Ar this occasion, the Committee expressed several recommendations concerning the follow-up of the inventory of pieces of art stored in Phnom penh, the mobilization of the contributions for the international work-sites, the development of human resources, and the enforcement of the decisions of the Plenary Session of the ICC.

It examined and assessed new projects of an international nature and ones foreseen under bilateral cooperation to be implemented by members states, international and non governmental organizations.

These 8 projects concern research programme, restoration and preservation and presentation programme of the Monuments of Angkor.

The different delegations present have outlined their projects, and the means which the members countries and international organisations propose to provide.

Finally, this meeting offered the opportunity for countries and organisations to reiterate their determination to assist the Royal Government in the implementation of the Plan of Emergency for the safeguard and development of the site of Angkor and the Siem Reap area.

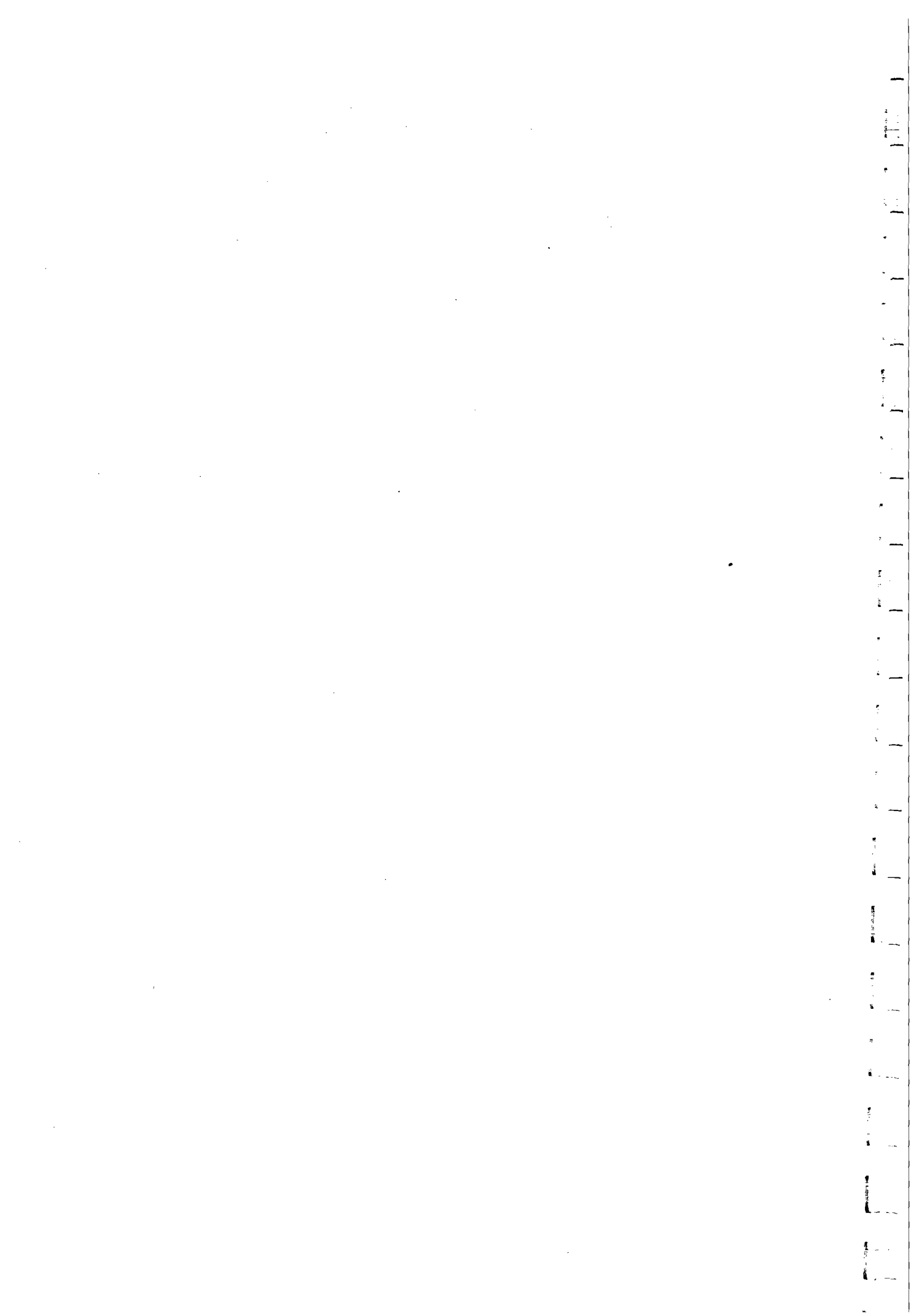


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**INTERNATIONAL CO-ORDINATING COMMITTEE
ON THE SAFEGUARDING AND DEVELOPMENT
OF THE HISTORIC SITE OF ANGKOR**

**FIRST SESSION OF THE TECHNICAL COMMITTEE
(Phnom Penh, 31 March 1995)**

AGENDA

I - Introduction by the Co-Chairmen

II - Introduction by the Representative of the Royal Government of Cambodia

III - Report on the Plenary Session of the ICC

IV - On-going projects and studies and new projects

*** The institutional management framework**

*** Research programme**

*** Restoration, preservation and presentation programme of the Monuments
of Angkor**

*** Development of human resources**

*** Education of Populations**

*** Urban development and tourism**

*** Regional development**

V - Other Assistance proposal

VI - Various matters

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Detailed Agenda

Point I - Introduction by the Co-Chairmen

- Opening statement by each Co-President

Point II - Introduction by the Representative of the Royal Government of Cambodia

- Opening Statement

Point III - Report of the Plenary Session of ICC (2 -12 - 1994)

- Document enclosed (Contributor : M. Azedine Beschouch)

Point IV - On-going projects and studies, and new projects

**** The reinforcement of the institutional framework for the management of Angkor***

a) International institutional framework

- Agreement with UNESCO (document enclosed)
- Agreement with Sophia University (document enclosed)
- Second Regional Conference on International Humanitarian Law -Canberra (document enclosed and oral contribution of Mr Ros Borath)
- Chiang Mai Conference (Thailand) - January 1995 - (Statement given by the Minister of State enclosed)
- World Heritage Committee meeting (18th Session -Phuket) (Statement given by HE Mr Vann Molyvann and extract of the report enclosed ; Oral contributions : the Minister of State and Mr Beschouch)

** Technical Committee Recommendations concerning the actions to be*

b) National institutional framework

- Statement by the Minister of State concerning
 - APSARA
 - Supreme Council of National Culture
 - the draft Law on the Protection of National Cultural Heritage
(co-contributor : Mr Beschaouch UNESCO)

*** *Recommendations of the Technical Committee for an effective implementation of APSARA***

- Prevention of illicit traffic and restitution of works of art
(Contributor : M. E. Clement UNESCO and Mr Ang Choulean)
- Heritage Police Unit
(Contributor : Commissaire P. Chassagne)
- Demining (Contributor : Colonel Billault COFRAS)

*** *Recommendations of the Technical Committee concerning Heritage Police Unit and the pursuit of the demining activities in the Angkor sites.***

*** *Research programme***

a) Reports on on-going projects (oral and/or written contributions)

- Inventory of objects at the Angkor Conservation Office
(Contributors : Mr Jacques Dumarcay EFEO/Mr Ang Choulean)
- Project on Angkor (Contributor :Sophia University)

*** *Recommendations of the Technical Committee concerning the follow-up of the inventory project***

b) New Project

- "From Yasodharapura to Angkor Thom" Research programme

**** Restoration, preservation and presentation programme of the Monuments of Angkor***

a) Information on on-going projects and activities (oral and/or written contributions) - since written reports are distributed to participants, oral contribution should be limited to 3 mns for each contributor

- The Royal visit of His Majesty the King - Opening ceremonies of work-sites at Baphuon and Bayon (Statement made by HE the Ambassador of France, by HE the Ambassador of Japan and by HE the Minister of State and the Message from the Director-General of UNESCO enclosed)
- Restoration work of buildings 25 and 27 in Angkor Conservation Office - Introduction of the Japanese architect in charge of the renovation of buildings funded by the UNESCO Japanese FIT (Contributor : Mr Beschaouch UNESCO)
- The maintenance of the Site and installation of a lightning protection system at Angkor Wat (Contributors : Mr Dumarçay EFEO/ Mr Beschaouch UNESCO)
- Topometric surveillance for the central tower of Angkor Wat Conclusions of the IGN Report - (Contributor : UNESCO)
- Restoration and conservation project for three monuments - Royal Plaza (Prasat Suor Prat), Bayon and Angkor Wat (Contributor : Mr Nakagawa, Director of the Japanese Governmental Mission for the safeguard of Angkor)
- The Terrace of the Leper King (Contributor : Mr Jacques Dumarçay EFEO)
- Banteay Kdei (Contributor : Sophia University)
- Restoration of the Western part of the Causeway Dike of Angkor Wat (Contributors : Mr Ros Borath/Sophia University)
- Preah Khan (Contributor : Mr John Stubbs World Monuments Fund)
- Preah Ko (Contributors : the Representative of the Federal Republic of Germany Royal Angkor Foundation)
- The Royal Palace (Contributor : the Representative of the Republic of Indonesia)
- Restoration of the Temple of Baphuon (Contributor EFEO : M. Jacques Dumarçay)

**** Recommendations of the Technical Committee to mobilize the contributions of other countries and non-governmental organizations for the international work-***

b) New Projects

- Master Plan for the preservation, restoration and presentation of the monuments of Angkor (Contributor : Mr Beschouch UNESCO)

** Opinion of the Technical Committee*

- Project of assistance to the Angkor Conservation Office presented by the World Monuments Fund (Mr John Stubbs)

** Opinion of the Technical Committee*

- Creation of an International scientific and technical Documentation Centre (Contributor : Mr Beschouch UNESCO)

** Opinion of the Technical Committee*

- Project presented by the Angkor Foundation of Russia :
"The CONTACT Method"
(Contributor : Mrs Proskouriakova Angkor Foundation of Russia)

** Opinion of the Technical Committee*

- Project presented by the Angkor Foundation of Russia :
"Climatological and hydrometeorological description of Angkor site and the whole Siem Reap area with the purpose of giving recommendations for conservation and restoration works and for development of the area. Training of the local technicians"
(Contributor : Mrs Proskouriakova Angkor Foundation of Russia)

** Opinion of the Technical Committee*

- Organization of international assistance

- * Protection of persons and property at the worksites at Angkor
(Contributor : Mr Donaldson UNESCO)

- * Harmonization of salaries

** Opinion of the Technical Committee*

c) Information on :

- The Pre Rup restoration project
(Contributor : Mr Beschaouch UNESCO)
- The Colloquium on "The Hydraulic City"
(Contributors : Mr Dupavillon and Mr Beschaouch)
- The Round Table on the Radar Imaging Survey of the Angkor Eco-Site (Contributors : Mr John Stubbs/World Monuments Fund)

*** Development of human resources**

a) information concerning the training of national professionals

- fellowships, theoretical or practical internships -

- GIS training/ZEMP project (Mr Ros Borath)
- Training in Japanese projects
(Contributors : Mr Nakagawa Mission of Japan for the safeguard of Angkor)
- Training at the Faculty of Archaeology
(Contributor : Mr Ang Choulean)
- Restoration training in Indonesia
(Contributor : Member of the Indonesian Delegation)
- International Work-Site school
(Contributors : Mr Dumarçay EFEO/ Mr Beschaouch UNESCO)

*** Recommendations of the Technical Committee**

b) The training component in the projects being implemented : The 1 % for training to be included in the projects (ICC decision - 2 /12/94)

(Contributor : M. Christian Dupavillon)

*** Education of Populations**

a) Information on on-going projects (oral and/or written contributions)

- The Community participation in Protected Areas Project
(Contributors : UNDP/UNV and Mr Ros Borath)

b) The 1% for the development of local populations and the equipping of the villages of the Angkor Park (ICC decision - 2/12/94)

*** *Urban development and Tourism***

a) Information on on-going projects and activities (oral and written contributions)

- Tourism study funded by the Caisse Française de Développement
(Contributors : Mr Fournier
Mr Ros Borath
HE Sam Promnea Under Secretary of State, Ministry
of Tourism)

- Urban development study of Siem Reap funded by the Caisse
Française de Développement
(Contributors : Mr Clement
Mr Ros Borath)

- Identification of an infrastructural and urban management project
concerning the towns of Siem Reap and Phnom Penh funded by the
World Bank (Contributor : the Minister of State)

- Training of tourist guides and presentation of the site for visitors
(Contributor : M. Beschaouch UNESCO)

*** *Recommendations of the Technical Committee***

*** *Regional development***

- Information on the Master Plan Study on Angkor and Siem Reap
Regional Development (JICA)
(Contributor : Mr Katsuhiko Shinohara)

V - Other Assistance Proposals

- Report on the proposals presented at the ICC session of 2 / XII / 1994
(Contributor : M. Beschaouch UNESCO)

VI - Other Matters

- Renovation of the National Museum in Phnom Penh
(Contributors : Delegate of Cambodia
Mr Christian Dupavillon
Mr Azedine Beschouch)
- International Campaign (Contributor : Mr Dupavillon)
- Date of the next meeting of the Technical Committee

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STATEMENT BY THE CO-CHAIRMEN

STATEMENT BY THE JAPANESE CO-CHAIRMAN

Mr. Shigenobu Kato, in the name of the Japanese co-chairmanship, made the following statement :

His Excellency the Minister of State,
Ministers,
Excellencies,
Ladies and Gentlemen,

It is indeed a great honor for me to be here with you today at this third session of the Technical Committee of the International Coordinating Committee on the Safeguarding and Development of the Historic Site of Angkor.

To begin with, allow me to admit that this is the first time for me to be in charge - along with my colleague Mr. Gerard Porcell, Counsellor to the Ambassador of the Republic of France - of the co-chairmanship of this session, and I would like to ask all of you to co-operate with and help me make this meeting a successful one.

I am indeed impressed by the presented reports which testify the remarkable work being undertaken at Angkor by the international community, represented by the participants of this gathering. A tribute must be paid, in the name of the co-chairmanship, to the Royal Government for its efforts to set up a legal framework to ensure the protection, conservation and better presentation of the historic site of Angkor, especially for the creation of the Authority for the Safeguarding and Development of the Region of Angkor (APSARA).

The international community fully recognizes those efforts made by the Royal Government as it meets the required measures recommended by the World Heritage Committee for the protection of the Angkor Monuments registered on the World Heritage List.

Let us not, however, content ourselves with what has been achieved, but look rather to the long path lying ahead for us to tread. The Technical Committee has entered its second year, and while we rejoice that it is running smoothly, we must also realize that, with the increasing number of projects to be discussed, the importance of the Committee's role is also increasing. My country would like to continue its co-operation with the Royal Government of Cambodia, the Government of France and UNESCO as well as other

member countries and observers of the co-ordinating committee to contribute to the effective coordination of many future projects.

Before we proceed to the agenda, I would like to express my thanks to all of you present.

Thank you."

STATEMENT BY THE FRENCH CO-CHAIRMAN

Mr. Gerard Porcell gave the following speech in the name of the French Co-chairmanship:

**"His Excellency the Minister of State
Ministers,
Excellencies,
Dear Colleagues,
Ladies and Gentlemen,**

Three months have elapsed since the second plenary session of the International Co-ordinating Committee on the Safeguarding and Development of the Historic Site of Angkor, a session in which we have all observed satisfactory progress in the different topics that occupy our attention.

I would like to refer to the two major events that marked this last quarter. The first was the signing on February 19 by his Majesty King Sihanouk of Royal Krets #295/11 and 295/12, one modifying the composition and attributes of the Superior Council for National Culture, and the other creating the long awaited Authority for the Safeguarding and Development of the Region of Angkor (APSARA).

Here we can all gauge the progress that has been made with the establishment of the appropriate legal framework referred to by donors and the World Heritage Committee to guarantee the permanent registration of the site which was obtained provisionally in Santa Fe in December 1992.

The five establishments responsible for the management and maintenance of the site which will be placed under the joint supervision of APSARA and concerned Ministries (as specified in Article 2 of Kret 295/12) remain to be created by Anukret.

His Excellency Minister of State, Esteemed Ministers, in the name of the French co-chairmanship, I would like to thank you for your unrelenting effort which allowed us to arrive at this point, and to assure you of our support as you pursue the difficult task of

effectively setting up APSARA and creating the five public establishments provided for in the decree. The Committee is particularly concerned with the successful completion of this next step which should see the nomination of a Director for APSARA by the Co-Prime Ministers.

The co-chairmanship would like to insist on the urgency of the nomination and to suggest that the primary criteria for selecting the person be technical competency.

France, and Japan with her, I am sure, was honored by the presence of His Majesty King Norodom Sihanouk at the opening of the work site at Baphuon and at the presentation of the work site of Bayon's Northern Library. February 21st will mark the history of our international cooperation for Angkor. I would like to ask the Minister of State to transmit our gratitude to His Majesty for his warm words regarding the work of our committee, for these very words are the second major event that took place during the first quarter of 1995.

I would like to remind you that during the December 2nd plenary session some important proposals were adopted. Among the most significant:

- on the one hand, it was decided that 1% of the cost of all implemented projects (whatever their nature) would be reserved for the training of men and women of this country, and another 1% for the development of the population of the Siem Reap/Angkor area. Institutions such as ours generate their own jargon, and I have already heard spoken of the "rule of 1 + 1" on a number of occasions. Allow me to express my hope that the "rule of 1 + 1" will be honestly respected by all and that it will become the golden rule.

- on the other hand, the Committee adopted the principle of the creation of an international fund to be subsidized by the countries and organizations desiring to support large projects in Angkor that bring together international expertise.

These two proposals were unanimously adopted, and constituted without a doubt significant progress towards ensuring, in the future, the reinforcement of the national capacity to participate effectively and concretely in the efforts to safeguard and develop Angkor and to promote the widest possible international participation in these efforts.

We are once again gathered in a technical group in this room at the Council of Ministers which the Royal Government kindly put at the disposal of the Committee. We will now go on to an exercise which has become familiar to the participants, based on the agenda so well prepared by the UNESCO secretariat which was recently joined by a permanent agent under French sponsorship.

The agenda has only one defect: it is extremely heavy! Seeing this, the co-chairmanship has had to make a difficult decision: thus presentations and speeches will be timed.

Hoping that this constraint will be accepted by all, we ask for your indulgence and understanding that this is not an authoritarian measure, which would have no business in this setting, but simply a limitation necessary to help us work efficiently. Indeed, the secretariat has asked participants to prepare short and concise documents, which will allow each of us to make a rapid assessment on each of the subjects broached.

Your Excellencies, Ministers, Ladies and Gentlemen, in closing allow me to express my best wishes for the continued health of His Majesty the King, who has had to absent himself for a short period to visit his doctors. May we soon find him back in Phnom Penh on the occasion of the New Year.

Your Excellencies, Ministers, Ladies and Gentlemen, let us get to work without further delay.

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**STATEMENT BY THE HEAD OF DELEGATION
OF THE KINGDOM OF CAMBODIA**

His Excellency Mr Vann Molyvann, Minister of State, made the following statement:

Mister Co-Chairmen,
Excellencies,
Ladies and Gentlemen,

During the second plenary session of the International Co-ordinating Committee which took place December 2nd of last year, I announced three principal points of the Operating Plan for 1995:

- 1) the establishment of APSARA with sufficient financial support.
- 2) the restoration work to be done at the Bayon to be a model of international cooperation.
- 3) the launching of tourism at Siem Reap/Angkor.

Regarding this first point, you are all aware that the text of APSARA was approved by the Council of Ministers during its January 27th plenary session, and ultimately approved by His Majesty the King with his signature on February 19th.

Endowed with a legal framework, APSARA enters its starting phase regarding staff, location and equipment. Allow me to remind you that the Caisse Francaise de Developpement has generously agreed to provide financial support for the establishment of this organization. I would like to solicit the complete support of the International Co-ordinating Committee for its rapid establishment.

Regarding the second point, on February 21st, Their Majesties the King and Queen successively honored, by their very distinguished presence, ceremonies marking the reopening of the worksite at Baphuon and the opening of the worksite of Bayon's Northern Library. The Japanese government team thus launched a vast rehabilitation effort of the famous monument of Jayavarman VII. The Royal Government renewed its hope that a masterplan be designed with a view to perfect coordination and cooperation of the various international teams involved.

Finally, regarding the third point, the schedule of urban and tourism studies has been kept. Thus, the phase one studies submitted for discussion to various ministerial and governmental bodies were approved. At this time, I would like to underline that the

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document entitled "Institutional and Financial Study" (December 1994 version), which was the object of a detailed ministerial debate, was adopted in its entirety. The second phase needs to be finalized as soon as possible in order to define priority projects and launch invitations to bid.

Let me remind you that the projects identified to begin at the end of 1995 for a period of five years include:

- a hotel complex estimated at US\$ 14,973,000
- work to develop the Angkor Park for US\$ 17,887,000
- urban planning work for Siem Reap for US\$ 11,490,000

For a total of US\$ 44,350,000.

Considerable progress has been made since the last time we met. I have no doubt that the concrete undertakings at the worksites beginning the program of conservation, preservation, and promotion of the monuments will vigorously continue in order to develop a controlled form of tourism for Siem Reap/Angkor.

Thank you.

After proceeding with the adoption of the agenda, **Mr. Porcell** invited members to examine the item related to "Summary of the plenary session of the Committee" which took place December 2, 1994, in Phnom Penh.

SUMMARY OF THE PLENARY SESSION OF THE INTERNATIONAL CO-ORDINATING COMMITTEE

After pointing out that the document was a summary of the meeting and not the minutes, **Mr. Beschaouch** asked members present to submit their observations in writing.

He reminded the group that the summary includes an item related to the ad hoc Commission of experts for the Technical Committee and in this regard, he underlined that UNESCO had not requested the ad hoc group, but that its creation responded to an official request by the Committee to allow it to function better.

He concluded his comments by recalling his request that observations and comments regarding this document be put in writing by the members of the Committee and submitted to the secretariat before the end of the present meeting.

NEW AND ON-GOING PROJECTS

I - REINFORCEMENT OF THE INSTITUTIONAL FRAMEWORK FOR MANAGEMENT

A) - INTERNATIONAL INSTITUTIONAL FRAMEWORK

The Minister of State presented a broad outline of the *Agreement concluded between UNESCO and the Royal Government of Cambodia, January 9, 1995*, which sets down the principles, conditions, and mode of operation of the UNESCO Office in Cambodia and of the cooperation programs.

He applauded the signing of a *Convention relative to the Cooperation between the Superior Council for National Culture and the Institute of Asian Cultures of Sophia University* on December 20th, 1994. This convention formalizes relations between the Kingdom of Cambodia and the Sophia IAC in order to establish and develop cooperation in the areas of archaeology, human and social sciences and the conservation of the cultural heritage of Cambodia.

The Minister of State underlined that this convention effectively provides long term assistance as emphasized in the Tokyo Declaration and said that he hoped that it could be developed in the framework of expansive international projects such as that of Bayon.

Mr. Ros Borath, Counselor to the Minister of State, presented the work of the second conference on *International Humanitarian Law* which took place December 12 to 14, 1994, in Canberra, at which the following three requests were presented:

- that all transit countries (notably Thailand, Singapore and Hong Kong) as well as countries that receive illegally exported Khmer artifacts immediately impose a moratorium on illicit traffic of Khmer cultural artifacts;

- that the International Council of Museums invite each of its national committees to implement the above measure worldwide;

- that the World Heritage Committee preside over negotiations between Cambodia and all countries of transit and countries receiving illegally exported Khmer cultural artifacts, so that they can work together to assure the permanent protection of the Cambodian cultural heritage.

In the name of the co-chairmanship, **Mr. Gerard Porcell** applauded Cambodia's participation in such conferences. **The Minister of State** indicated that Cambodia would also participate in a conference which will take place in Italy this June, to study possible amendments to the 1970 Convention concerning measures necessary to forbid and impede the import, export, and transfer of illegal cultural property.

The Minister of State invited the members to refer to documents provided regarding the international conference on "*The Future of Asia's Past*" which took place in Chiang Mai (Thailand) in January 1995.

After underlining the importance of the speech made by His Excellency Mr. Vann Molyvann during a meeting of the World Heritage Committee which took place in Phuket in December 1994, **Mr. Beschaouch** recalled the Committee's desire to see the final condition for the definite registration of Angkor on the World Heritage List fulfilled, in other words the promulgation of the Law on the Protection of the National Cultural Heritage.

He also indicated that the next meeting is scheduled to take place in Berlin in December 1995, and that Cambodia, to participate as a member, needs to be elected during the Convention of Member States which will take place on the occasion of the UNESCO General Conference and therefore needs to be supported by France, Japan, and all the participants.

The Co-chairmen indicated that France and Japan would support Cambodia's candidacy.

The Technical Committee made the following recommendations regarding the item related to the World Heritage Committee:

Recommendations of the Technical Committee:

The Technical Committee recommends that France and Japan, as well as other participating countries, support the candidacy of Cambodia during the elections of members of the World Heritage Committee which will take place during the Convention of Member States, to be held in Paris in October 1995 on the occasion of the UNESCO General Conference.

The Technical Committee recommends that the Law on the Protection of the National Cultural Heritage, the final condition to be fulfilled for the registration of Angkor on the World Heritage List, be promulgated before the next meeting of the World Heritage Committee scheduled in Berlin in mid-December 1995.

B) - NATIONAL INSTITUTIONAL FRAMEWORK

- The Superior Council for National Culture (Kret #0295/11 of February 19, 1995)

After recalling the composition of a Superior Council for National Culture, co-headed by two Prime Ministers, **His Excellency the Minister of State** detailed its role and attributes as stated in article 3. He underlined that it constitutes the only partner organization for the safeguarding and protection of the site.

At this time, the Minister of State inquired whether the activities and actions concerning the National Museum of Phnom Penh could continue to be examined by the Committee although they are not normally part of the mandate of ICC.

In addition, he requested the Ministry of Culture and Fine Arts to put at the disposal of the Superior Council for National Culture an office location for APSARA.

Mr. Gerard Porcell recalled that the Committee continued to consider the National Museum an extension of Angkor and asked that the Royal Authorities inform the co-chairmanship if any decisions to the contrary were made.

Regarding the transfer of documents concerning Angkor to the Superior Council for National Culture, Mr. Porcell observed that article 5 stipulates that: "The Co-chairmen of the Superior Council for National Culture establish a permanent secretariat at the Ministry of Culture and Fine Arts. This secretariat is headed by the Minister of Culture and Fine Arts."

- APSARA - Authority for the Safeguarding and Development of the Region of Angkor

The Minister of State outlined Kret #0295/12 signed by His Majesty the King on February 19, 1995, creating under the name of APSARA a national public establishment endowed with legal responsibility and administrative and financial autonomy which has as mission to design and implement the maintenance and development of tourism in five zones defined by a study of the zoning and environmental management plan of Siem Reap - Angkor, subject of Kret #001 NS of May 28, 1994. To this end and in conjunction with concerned ministries, APSARA will oversee the agencies responsible for the management of the site and the maintenance of the above defined region.

The Minister of State indicated that Mr. Ros Borath and Mr. Ang Choulean were proposed for the posts of Director General of APSARA and Director of the Institute of Khmer Culture respectively. He indicated that the Heritage Police Unit would be placed under the dual supervision of APSARA and the Ministry of Interior.

His Excellency Mr. Vann Molyvann underlined the importance of the assistance of the Caisse Francaise de Developpement for assuring the earliest possible effective establishment of APSARA.

In the name of the co-chairmanship, Mr. Porcell applauded the energy and efforts made by the Royal Government to establish this institution and expressed hope that the Administrative Council of APSARA meet soon in accordance with article 9 of the Kret.

Mr. Hubert Dognin, Director of the Caisse Francaise de Developpement, underlined the importance of supporting the start-up of this new structure. He indicated that this would take the form of legal assistance. This assistance would be provided during the current phase. An endowment of 7 million French Francs would be granted to APSARA to allow it to proceed with recruitment of staff. However, the nomination of a Director General and the preparation of a budget must absolutely be done in advance.

Mr. Dognin recalled that in this matter the actual role of APSARA and the power which it will dispose of will depend on the means given to it, notably the funds which will be attributed to it.

He concluded his comments underlining that the Caisse was prepared to offer its assistance as soon as the necessary measures were taken.

- The project of the Law on the Protection of the National Cultural Heritage

After applauding the Royal Authorities for taking action on the recommendation of the World Heritage Committee regarding the promulgation of a Law on the Protection of the National Cultural Heritage, **Mr. Beschaouch** indicated that a project had been elaborated with the technical assistance of **Mr. Riddha Fraoua**, consultant to UNESCO, and submitted to the Superior Council for National Culture.

The Minister of State expressed his desire that the text be rapidly voted on so that the final condition be fulfilled for the registration of the site of Angkor on the World Heritage List to be completed. He indicated that to this effect the project could shortly be submitted to the Legal Committee.

- The fight against the illicit traffic of works of art and for their return

Mr. Etienne Clement, from UNESCO's International Standards Section, recalled the various activities and measures that have been or are being taken, in Cambodia and abroad, to fight against the illicit traffic of works of art and to assist in their return.

Aside from the adoption of legislation, these measures include:

- the inventory (with photographs) of both cultural objects (in museums and storage) and of monuments (buildings and sites) ;

- increased security measures in museums and warehouses (security systems, guards, staff training);

- protection of monuments and sites (notices, limited access zones);

- education for the general population and for students;

- the police (establishment of an INTERPOL National Central Bureau , training of adequately equipped police officers), customs (training of customs officers at the airport and borders with adequate security equipment);

- tourism measures (information for tourists and visitors, brochures, and notices).

Outside Cambodia, the measures emphasize:

- the reinforcement of cooperation with the other Member States of the 1970 Convention with an aim to curb import of cultural goods coming from Cambodia (eg. with the United States, in view of the fact that the 1970 Convention applies thanks to a U.S law).

- the conclusion of bilateral agreements with states that are not signatories of the Convention;

- dissemination of information on theft and looting of Cambodia's cultural goods for the general public, tour organizers, art merchants, and especially in the ICOM-EFEO-UNESCO publication entitled "One hundred missing items - Looting in Angkor."

- dissemination of information on stolen items through the INTERPOL National Central Bureau ;

- preparation of official requests by Cambodian authorities sent to known possessors of items in order to recover them.

The Minister of State underlined the importance of maintaining close collaboration between the Superior Council for National Culture, UNESCO and ICOM, and indicated that a number of cases were open, notably pieces seized by American customs officials, the head of a statue recovered at the Metropolitan Museum, and a number of items deposited in the National Museum in Bangkok. He hoped that the secretariat would take steps to recover these pieces.

Mr. Prachote Sangkhanukit, Director of the Division of Archaeology, Department of Fine Arts, Thailand, made the following statement:

"The Delegation from the Kingdom of Thailand has the honor to announce to the Committee that during the course of the visit of His Excellency Mr. Hun Sen, the question of the 13 pieces seized by Thai authorities was examined by both Prime Ministers who came to a common understanding. Thai authorities have reiterated their desire to return the pieces to Cambodia. According to Thai law and international custom, Cambodia is invited to provide evidence that the pieces originate in Cambodia. The Cambodian Prime Minister expressed his gratitude to Thailand for seizing the stolen pieces and for indicating its intention to return them to Cambodia."

The Minister of State thanked the Representative of the Royal Thai Delegation.

- Heritage Police Unit

Commissioner Pierre Chassagne highlighted the extremely positive result of the activities of the last few months - 28 cases were handled, 54 arrests made and 83 archaeological pieces were recovered - to which must be added 2 new arrests and 25 additional recovered pieces.

Nevertheless, he regretted that the radio antenna had not been installed yet which greatly limits the effectiveness of the radios (reducing them to 15% capacity). He underlined that the absence of a decree establishing the mandate of the Heritage Police Unit inhibited the recruitment of staff and he hoped that matters between the Ministry of Interior, the Heritage Police Unit and the Provincial Police could be settled.

Finally, he lamented the fact that the Heritage Police does not have enough petrol and reminded everyone that the cost of the petrol is minimal compared to the revenue of the site.

Commissioner Chassagne indicated that INTERPOL had communicated the fact that none of the items presented in the ICOM brochure (some of which had been located in the United Kingdom and the United States) had ever been declared missing by the Cambodian judicial system. On this subject he insisted on the importance of the Ministry of Justice filing complaints thus setting into motion an international process with rogatory commission.

Commissioner Chassagne ended his statement by crediting the various Cambodians responsible for facilitating the creation of the Heritage Police Unit, Mr. Cheso Path and His Excellency the Governor of the Province in particular. He said he hoped the Cambodian authorities would reward staff who completed their duty under difficult conditions.

Mr. Porcell underlined that it was difficult to ask the international community to provide funds for the petrol that the Heritage Police Unit needs for its activities.

Then in the name of the co-chairmanship he emphasized that it was important for the Cambodian authorities to design and put into effect appropriate legal procedures to consider the objects stolen and concealed, and not simply as lost.

In the name of the co-chairmanship he applauded Commissioner Chassagne for his determination which allowed for the creation and start of the Heritage Police Unit.

- Demining

Colonel Billault presented the various activities implemented by COFRAS on the sites as well as within the region. He indicated that in addition to a number of dangerous contraptions, there are approximately one thousand mines located in the area, which is considered relatively few. Even if the temples can be considered cleared, the surrounding brushwood is still dangerous.

The Colonel recalled that only COFRAS is responsible for neutralizing mines, while the other organizations detonate them. He gave the example of the temple of Banteay Srei where 18 mines were found within the enclosure. Detonating them instead of neutralizing them would have caused irreparable damage.

Colonel Billault underlined the necessity of ensuring the continued security of a site prior to demining. Thus at Banteay Samre where the brushwood and the suspicion of the existence of mines ensured relative security, the clearing and demining of the temple, which does not have continued security, resulted in looting.

Colonel Billault recalled that COFRAS does not limit its activities to the monuments alone but extends them to the entire Angkor area, thus directly benefiting the local population.

The Minister of State expressed his hope that the demining activities would continue and requested the European Community Representative to ensure their continued financial support.

Mr. Shinohara, Regional Coordinator, First Division of the Southeast Asia Department of the Japanese Ministry of Foreign Affairs, recalled that at the recent ICORC meeting it was decided that CMAC activities would continue and hoped that these would be coordinated with COFRAS' activities.

Mr. Beschouch indicated that only COFRAS operates in the Angkor area. **Mr. Dupavillon** underlined the importance of the continuation of COFRAS activities to protect the worksites in light of plans to develop them.

Recommendations of the Technical Committee

The Technical Committee recommends the continuation of the activities of the Police Heritage Unit with adequate financing and urges the Ministry of Justice to initiate legal procedures to register objects as stolen and concealed, and not as lost.

The Technical Committee recommended the continuation of demining activities in the Angkor area and the continued assured protection of sites after they have been cleared.

H. Exc. Dr Gauri Shankar Rajhans, Indian Ambassador, had to leave the meeting and made the following statement before doing so :

“Excellencies,

Let me convey my greatfulness to the International Coordinating Committee for giving me this opportunity to present the Government of India’s commitment in restoration of Angkor Wat. We had earlier circulated India’s interest and Archaeological Survey of India’s (ASI) concrete programme (cf. the project presentation format at the earlier meeting of the ICC held on 8th October, 1994.) That format had, in detail, outlined the work description and techniques which ASI plans to undertake.

I would not like to waste the time of this august gathering by going in detail into the technical aspects of our submission. However, I would like to reiterate as per the ASI proposal that the Government of India is interested in completing the work they had earlier undertaken in the second enclosure, conservation of massive plinths of the first enclosure, northern and southern libraries in between these enclosures, southern library between second and third enclosure, re-conditioning of flooring between second and first enclosures, the western causeway on the moat and restoration of the gateway on the northern, southern and eastern sides.

ASI has committed itself to use original materials like sandstone and laterite in their restoration work. Due to paucity of time, ASI has not been able to convey to us the composition of its team to be deputed nor its leader. However, I would like to assure the meeting that this would be soon conveyed to the ICC and to His Excellency Minister Vann Molyvann. The technical dossier of the work to be undertaken and the details of techniques to be used would be provided in near future.

Thank you.”

The Co-chairmen and H. Exc. Mr. Vann Molyvann thanked H. Exc. the Indian Ambassador for his statement.

II - RESEARCH PROGRAM

A) - INFORMATION ON ON-GOING PROJECTS

- Inventory of pieces and artifacts at the Angkor Conservation Office

M. Jacques Dumarçay, EFEO, recalled the main guidelines of the project aimed at establishing a descriptive and computerized inventory of the objects stored at the Angkor Conservation Office. This project, coordinated by Professor Dagens, is managed by Miss Christine Hawixbrock and benefits from alternative assistance by two French researchers. It includes the training in inventory techniques and use of computers for young Cambodian researchers.

Almost all the pieces stored in depot A have for the moment been inventoried and filed. The description of the pieces are made, then they are stored according to their sizes and types.

All small and medium size pieces are stored in the first floor of the building, and the smaller are kept on special shelves or in baskets (16 shelves and 50 baskets have been bought). The pieces stored on the ground are, when necessary, given a concrete socle, built by the laborers attached to the project (270 socles have already been built).

Once stored, the pieces are clearly identified (by number of shelf or basket) and the information is computerized to help identify the pieces when necessary.

The training offered to the three trainees relies on their active participation in the inventory and is completed with French courses at the Siem Reap French Cultural Center. The training in inventory procedures (description methods, technical vocabulary...) and on computers is very practical. The trainees write out descriptive sheets and file them on the computer, with constant assistance. Their knowledge in terms of archaeology, history of art and khmer iconography are also upgraded.

The description and storing of the pieces stored in depot A will be completed by the end of March. The descriptions of 2000 objects stored in depots B and C and in Phnom Penh will then have to be made. A secretary will help with the filing job.

The project also participated in the funding of the photographic laboratory of the Angkor Conservation Office (Luxemburg/UNESCO project). It will use, with specific funding, the expertise of a photographer to carry out a photographic inventory of approximately 30 000 pieces.

Mr. Dumarçay also pointed out that the descriptive sheets of each piece mentions the broken parts to prevent dissimulation in case of theft.

The Minister of State underlined the importance of the continuation of this inventory in Phnom Penh. Mr. Dupavillon, French coordinator for Angkor, assured him that it will continue and pointed out that the project will give way to a scientific publication of photographs.

Recommendation by the Technical Committee

The Technical Committee recommends the continuation of the inventory in Phnom Penh for the pieces stored there, when the on-going work in the Conservation Office will be finished.

- Project on Angkor

Professor Ishizawa, Head of the Sophia University Mission, presented the works carried out by Sophia University.

Since 1980, 4 preliminary missions and 15 scientific missions have been fielded with support from the Council of Ministers of Cambodia, the Superior Council for National Culture and the Ministry of Culture and Fine Arts. Studies are being done in collaboration with the Conservation of the Monuments of Angkor, with authorization by His Majesty the King of Cambodia, and under the control of the Superior Council for National Culture.

The mission has carried out basic studies for the safeguarding and restoration of the monuments of Angkor, socio-cultural researches in the Province of Siem Reap and training of personnel at the Phnom Penh University of Fine Arts, in collaboration with the Superior Council for National Culture and the Ministry of Culture and Fine Arts.

Professor Ishizawa recalled that 19 missions have been fielded to date, to which 160 Japanese professors and experts, 32 Cambodian experts and researchers and 12 international experts and researchers, participated.

He indicated that the Temple of Banteay Kdei had been chosen by the Mission, in agreement with the Superior Council for National Culture and the Ministry of Culture and Fine Arts, to carry out specialized and detailed studies in the areas of architecture, archaeology, geology, stone, civil engineering, environment, hydrography, tropical vegetation and socio-cultural development.

Since four years ago, archaeological excavations are being carried out on Banteay Kdei. They have led to the finding of many vestiges, such as tiles, fragments of pots or ceramics.

The results of these studies are regularly published, with a 10 volume report entitled "Cultural Rebirth of Cambodia", published in Khmer, French, English and Japanese.

Since 1991, a training program destined for the students of the Faculties of Archaeology and of Architecture of the University of Fine Arts has been launched by the mission. During these four years, 16 specialized seminars have been organized by 64 teachers, totaling 53 days of training. Thirty-five teachers have also been able to visit the site of Banteay Kdei.

Professor Ishizawa pointed out that the socio-cultural development project for Banteay Kdei particularly dealt with the issues of environment and of local communities, studied from the point of view of the relationship between the protection of historical monuments and the necessary socio-cultural development of the villagers.

The mission also offered to the University of Fine Arts 780 books, more than 1500 slides and several scientific documents on Angkor and Khmer civilization. Two Toyota landcruisers and two crane-lorries have been offered to the Angkor Conservation Office.

Professor Ishizawa indicated that two khmero-franco-japanese scientific meetings had been organized in Banteay Kdei, in collaboration with EFEO, from March 20-24, 1994 and from March 15-16, 1995.

After having evoked the Cooperation Convention signed on December 20, 1994 between the Superior Council for National Culture and Sophia University, essentially dealing with assistance to the Angkor Conservation Office, restoration of monuments and training of students and stone-cutters, Professor Ishizawa concluded his intervention by recalling the three principles on which rely the activities of the Mission :

- cooperate with the Kingdom of Cambodia and assist in its efforts to ensure its independence.

- maintain close links between the scientific study of monuments and the preservation projects for the sites and monuments of Angkor.

- help in establishing and maintaining a balance between economic development and socio-cultural development of the local communities in the area of Angkor.

The Co-chairmen thanked Professor Ishizawa for this presentation and **Mr. Beschaouch** pointed out the importance of publishing after conducting a reserch .

With the **Minister of State** having asked to have a wide circulation of these works, **Mr. Dupavillon** remarked that APSARA was to take this in charge. **Mr.**

Beschaouch indicated that the publishing of the leaflet "Save Angkor" would continue and that UNESCO would help APSARA in this job.

B) NEW PROJECT

"From Yashodharapura to Angkor Thom" - Research Program

Professor Jacques Gaucher, head of the project, presented the main guidelines of this research program proposed by EFEO.

This project, with an initial duration of two years, will be funded by French funds reaching 2, 127, 500 FF (US\$ 423,000).

This interdisciplinary comparative urban history research program will focus on the site of Angkor Thom, Royal Capital, and is aimed at bringing light upon the concept of the city and more particularly the khmer city. It will deal with both urban research and archaeology. It will study the fortified site of the last great royal creation in Angkor, Angkor Thom, capital of Jayavarman VII, and its close surroundings.

Its main goals are to study :

- the urban history of the creation, the choice of the site, the urban planning at the time of Jayavarman VII, the structures of the fortified city, the types of occupation (populations, spatial distribution of the functions and of the communities), urban life (organization of time, of urban events, of the economy, activities, etc.).

- the modalities of articulation between the last stage of the Capital and the previous historic periods

- the knowledge concerning the natural framework of the initial site

- the integration of the city (urban-rural continuum) in its territorial context

- the comparison between angkorian urbanism and contemporary urban organizations.

In the first phase, the cartographic and archaeological investigations will focus on the southern part of the city, between the northern part of the Royal Plaza and the enclosure wall of Angkor Thom. Archaeologically speaking, a series of excavations will take place in the Royal Palace and the southern quarters of Angkor Thom.

The project will have two phases, one aimed at collecting all existing documentation and surveying the site with a stratigraphic point of view. The second phase

will give way to the implementation of extensive excavations in several sectors according to an appropriate methodology.

The Royal Palace has been excavated on several occasions, the first excavations being done by H. Marchal in 1916-1917 and the last ones by B.P. Groslier in 1958. These works have shown that the site was permanently occupied between the Xth and XVth centuries. It is therefore an ideal site for the setting up of a stratigraphic scale of excavations which is currently lacking and which will be useful to all teams that will excavate the site.

The following sites have been identified :

- the Royal Palace and immediate surroundings
- the Royal Plaza of Angkor Thom, in coordination with the Japanese mission that carries out works on the Prasat Suor Prat and the North-Eastern part of the Plaza
- the districts of Angkor Thom
- the structuring canals of the city of Angkor Thom, with, if the state of conservation of the monuments allow, a partial and homogeneous restoration of these canals, possibly their filling up with water. This would be a new and remarkable contribution to the better presentation of monuments such as the Bayon and to the recreation of an urban environment close to what had been conceived by the khmer architects.
- the enclosure system, with a clearance job and drillings to have a precise survey.

Professor Gaucher pointed out that, along with the archaeological excavations, a complete graphic documentation on the site would be created :

- elaboration of an atlas of the monuments of Angkor Thom
- the setting up of a global Plan of archaeological urbanism for the city of Angkor Thom, that will help elaborate several historical maps of the site.

Two training domains will be set up, in archaeology and archaeography. A group of students recruited in the Faculties of Archaeology and Architecture of the Royal University of Fine Arts, will be trained, in agreement with the Royal Authorities, in archaeological investigations. These trainings will be organized by French experts, and some students will benefit from scholarships to France on precise subjects in accordance with the needs of Cambodian research.

The following trainings are foreseen :

- theoretical courses in Khmer archaeology and architecture
- techniques of archivist
- practical internships dealing with techniques of archaeological excavations, archaeographic techniques, drawing of archaeological objects, topographic surveys, architectural surveys, stratigraphic drawings with techniques of photogrammetry, study and practice of restoration of ceramics.

Professor Gaucher concluded his intervention by indicating that the proposed research program and archaeological investigations should last five years and will require, if it is approved, the demining of the site.

The Minister of State expressed satisfaction over this research program and wished that it become a link between the researchers and experts of the various teams working on the site of Angkor Thom. He also wished that a greater attention be paid to the coordination between this research program and the tourism development projects, so that the transportation facilities that are planned do not destroy the vestiges.

The Minister of State insisted on the necessity of coordinating this program and the researches carried out by the Japanese Mission in the framework of the projects conducted by the Government of Japan on the Bayon and the Prasat Suor Prat. **Mr. Shinohara** replied that the Minister's advice would be respected in terms of coordination of the works.

Mr. Beschaouch underlined the quality of this project that will allow a historical study rooted in the results of archaeological excavations.

Professor Gaucher recalled that this project was open to international coordination and **Doctor Elizabeth Moore** declared her interest in participating.

Advice from the Technical Committee

The Technical Committee is in favor of the implementation of the research program "From Yasodharapura to Angkor Thom" presented by EFEO.

III - PROGRAM OF PRESERVATION, RESTORATION AND BETTER PRESENTATION FOR THE MONUMENTS OF ANGKOR

A) INFORMATION ON THE ON-GOING PROJECTS

- Visit by His Majesty the King - Inauguration of the restoration work-sites of Baphuon and of Bayon

H. Exc. the Minister of State underlined the importance of the Royal visit that proves His Majesty's interest in the international campaign for the safeguarding of Angkor. He indicated that the members of the Committee had a copy of the speeches given on the occasion of the ceremonies in their file.

- Renovation of the buildings n°25 and 27 of the Angkor Conservation Office

Mr. Beschaouch recalled that the Committee had had to examine the project of renovation of the buildings of the Angkor Conservation Office and that this project, approved by the Royal Authorities on February 18, 1994, particularly dealt with the renovation of buildings n°25 and 27.

The maximum duration of the project is 6 months and it will be funded by UNESCO/Japanese Funds-in-Trust, for an amount of 157,300 US\$. In the framework of the technical assistance provided to the Angkor Conservation Office, its goal is to rehabilitate, under the guidance of the architect Mr. Tatsuya Ichikawa, the two main buildings of the Angkor Conservaton Office :

- building n°25 which shelters the administrative offices

- building n°27 which is destined for the International Scientific and Technical Documentation Center and the premises of APSARA in Siem Reap.

Mr. Beschaouch introduced **Mr. Ichikawa** and pointed out that the work had started with building n°27 that the Royal Authorities had reserved for the International Scientific and Technical Documentation Center, and that the invitation to tender is on-going. When the work on this building is completed, it will be temporarily occupied by the administrative staff of the Conservation, until work is also completed on building n°25.

- Maintenance of the site and installation of a lightning protection device at Angkor Vat

With a US\$96,825 budget, funded from UNESCO/French Funds-in-Trust, this project of maintenance of the site has been carried out by EFEO from October 15, 1993 to February 15, 1995, and was aimed at ensuring the clearing and regular maintenance of the monuments and their surroundings to prevent further damage by the vegetation, and to facilitate access for the tourists.

The clearance job was also necessary to implement activities of research and restoration by providing a proper and permanent access to the monuments.

The clearance work has dealt with the monuments located along the "Petit Circuit" and those inside Angkor Thom.

The implementation of the project of maintenance of the sites has allowed to set up a permanent work-team and a long term planification of the works to be carried out. The setting up of this team has led to reorganizing the framework of intervention of the three organizations working on the site. The job has been distributed as follows :

- ILO has taken in charge the clearing of the surroundings of the monuments, of the causeways, moats and ponds and of all the large areas

- EFEO took in charge the clearing of the structures and of the inside of the monuments

- the Angkor Conservation Office staff then ensured the daily maintenance of the cleared sites.

This cooperation has led to a good control of the development of the vegetation, it has allowed a rationalization of the work and the promotion of the specificities of each team.

EFEO recruited 50 laborers in the villages of Angkor Krao, Angkor Thom and Phum Thmey. They have been split in two teams, managed by two people designated for each team and responsible for distributing the work on the sites.

They worked 6 days a week, excluding Sundays, from 7 AM to 2 PM with a 30 minute break for lunch. The workers were paid a 2,500 riel daily salary and the team leaders 3,500. They were also paid on Sundays, public holidays, received a new year bonus and medical care in case of illness.

Mr. Dupavillon indicated that this clearance of the sites project would continue with UNESCO/French Funds-in-Trust.

Concerning the *installation of a lightning protection device at Angkor Vat*, **Mr. Dumarçay** indicated that the offered proposal was not totally satisfying and that extra information had been requested.

The Minister of State having recalled that it is an old project and that the work should be carried out before the coming rainy season, **Mr. Beschaouch** pointed out that if no satisfying proposal was presented in a few days, another company would be approached.

- Topometric surveillance network at Angkor Vat

Mr. Beschaouch recalled the deformations reported on the outer sandstone facing of the central tower in Angkor Vat. No precise geometric data allowed a diagnosis of the origin and evolution of the deformation. A team of two engineers, one French surveyor from the Institut Geographique National (IGN) and three Cambodian technicians trained on the spot carried out work at the end of 1993 in order to set up a topometric surveillance network for the central tower of Angkor Vat and to train the local technicians in the basic calculation methods.

He specified that this surveillance network, funded by UNESCO/French Funds-in-Trust, should allow the measurement of all deformation in the central tower. Discreet but lasting bench-marks have been put in place in the stonework of the second enclosure and of the central tower of the temple. The 101 bronze bench-marks sealed into the doorways and masonry will reveal any deformation of the monument. To detect any horizontal (planimetric) deformation, 76 other bronze bench-marks have been placed in the pediments, galleries and masonry. These bench-marks will serve as reference points for the extensive calculations that will be made as part of the second project.

Mr. Beschaouch indicated that **Mr. Plek Ly**, a geometrician from EFEO, assisted by **Mr. Uong Savana** and **Mr. Ban Keo**, has carried out, from November 26 to December 21, a complete survey of the 101 altimetric bench-marks of the network. They have recorded low amplitude movements, but a relative movement (1,5mm) has been recorded between the bench-marks of the first enclosure, that will be verified during the next operation. It has also been noticed that 3 bench-marks have been damaged and that 3 have disappeared.

The Minister of State remarked that surveillance networks could be installed on all monuments and asked the Japanese Government to consider this, in particular for the Bayon.

Mr. Beschaouch recalled that the figures given were not definitive and that IGN would hand in its conclusion after further study. Concerning the installation of a similar device on the Bayon, he proposed to ask for an offer.

- Project of restoration and conservation of three monuments

Professor Takeshi Nakagawa, Head of the Japanese Governmental Mission for the Safeguarding of Angkor, recalled that the fifth mission (November 1994 to January 1995) and the sixth mission (February 1995 to March 1995) had taken place as planned in the 4 year program which was presented during the meeting of the Technical Committee (October 1994 meeting) and which the ICC had officially approved in its December 2 1994 meeting.

The fifth mission has allowed experts in architecture, measurement and geology to carry out surveys and studies. It has also allowed for training of 5 students from the Faculty of Archaeology and 5 students from the Faculty of Architecture of the University of Fine Arts of Phnom Penh.

Apart from the above mentioned experts, the fifth mission has also brought together experts in archaeology, scientific conservation and stone engineering. An on-site training has also been organized for 5 students from the Faculty of Archaeology and 5 from the Faculty of Architecture.

The results of the fourth, fifth and sixth missions will be published in the annual report at the end of July 1995.

Concerning architectural studies, the following studies have been carried out :

- measures of the plans, elevations, sections of towers N1 and N4 of the Prasat Suor Prat;

- numbering and survey of the stones scattered around towers N1 and N4 and survey of their positions;

- measure of the plan of the cruciform terrace facing the Northern Kleang;

- study of the restoration of the towers after a detailed study of the vestiges of the anterooms of the towers that show remains of old modifications;

- measure of the plan, elevation, section and interior sides of the Bayon's Northern Library (80% of the works carried out);

- setting up of an automatic recording of the structural movements in 5 spots (2 in the Prasat Suor Prat and 3 in the Bayon) and of wind measurement at the highest point of the Southern Library of the Bayon. These works have been carried out in collaboration with the geotechnical and environmental department and the collection of data is on-going.

We continued excavations in basically the same areas as those in the fourth mission, although this time we extended the Trench A toward the north and the Trench C toward the west. In addition, we set up five new trenches (D,E,F,G and H), in order to investigate the structure of the stepped wall of the northern pond; of the projecting terrace in front of N3; of the southern end of the northern part of the terrace; and of the lower area adjunct to the west of the north group terrace (Figure 1). A series of intensive analyses of excavated materials are in progress. In the next mission, it is necessary to further extend our excavations in order to better understand how the structures mentioned above were built.

Concerning the geotechnical, geological and environmental studies, an electrical study has been carried out, from November 15 to 23 1994, along 8 lines to determine the electrical characteristics of the soil and to verify the utility of the boring of the geological structures of the soil method before drilling. The Wenner method is used (distance of 0,5 to 60 m).

Two lines have been studied in Phnom Bakheng to determine the resistance of the rock. They show, on each line, different values of the apparent resistance of the rock. A very high resistance, of several thousand ohm per meter has been recorded along the path at the foot of the hill. Another resistance, around 100 ohm/m has been recorded near the Phnom Bakheng, along the main road going from Angkor Vat to the Bayon. The main reason for this difference seems linked to the amount of water in the soil. Hydrometric conditions have an influence on the rock. The line at the foot of the hill being located higher than that along the road, it must benefit from drier conditions.

Other lines exist in Angkor, the Bayon, the Royal Plaza, Banteay Kdei and Siem Reap. Based on a model of analysis by horizontal layers, the recorded data show three types of layers:

- the higher layer, of low resistance, about 20 to 80 ohm/m, covered by a dry layer with a high resistance of thousands of ohm/m, is considered as clay.

- the second layer, that shows a standard resistance of 250-400 ohm/m corresponds to a layer of sand.

- the bottom layer, with a 100-200 ohm/m resistance, is considered as muddy sand or rock.

Conclusions:

The apparent resistance varies between 10 and 1000 ohm/m and three types of layers have been identified. The low resistance reflects the richness of fine tenors, high tenor in water, high tenor in ions of the sandstone. It is difficult to identify the geological formation of the bottom resistance that can correspond either to sandstone rich in ion, or to sand with a high tenor in clay.

Concerning the borings in the Bayon, in order to carry out geological and geotechnical studies, two borings have been done as follows:

BY1A (95) 40 m - penetration test every 0,5 m
BY1A (95) 60 m with drilling

The first drilling has been carried out in order to determine the solidity and hydrometric conditions of the soil. The rock becomes hard around 50m. The penetration test allows to reach the number (N) of thrust for each 30 cms of penetration of the boring (head weight, 63,5 kgs and hight, 75 cms).

0.0 - 2.4m : mainly sandy gravel, brown, with medium density (N=10-20)

2.4 - 6.2m : sandy clay, yellow and consistant (N=10)

6.2 - 9.0m : grey-yellow sand of medium density (N=15-20)

9.0 - 11.0m : yellow-brown sandy clay with strong consistence (N=16-20)

11.0 - 19.4m : grey-yellow sand of medium density (N=20-46)

19.4 - 31.0m : grey-brown sandy clay with very strong consistence (N=20-30)

31.0 - 36.0m : grey-brown hard sandy clay

36.0 - 60.0m : sandstone

Professor Nakagawa pointed out that borings were planned in other spots in Angkor Vat and the Royal Plaza, at the end of May 1995.

He concluded his intervention by underlining that past and present socio-economic knowledge was crucial for the mission, and that the Governmental Mission would be glad to cooperate with all other researchers.

Mr. Tomoda, architect member of the Governmental Mission, indicated :

“Concerning the problem of structural movement of the monuments which was pointed out by H. Exc.the Minister of State, we recognize the importance of studying foundation problems as one of the main causes of deterioration.

Since the fourth JSA mission, which took place last summer, geotechnical engineering study has been an essential part of various researches conducted by each mission. For instance, some automatic recording devices for measuring the seasonal movement of the underground water level and that of surface ground were installed at the Prasat Suor Prat. Now we are preparing to install similar devices around the Bayon, and

there we are also going to attach some gauges to measure the displacement or inclination of superstructure automatically. For the moment, these devices are going to be set up only at the Northern and Southern Libraries, but we are planning to set up such devices on the central mass of the Bayon in order to study the present condition and deterioration mechanism of the monument as a whole.”

The Co-chairmen thanked the representatives of the Japanese Governmental Mission for the Safeguarding of Angkor for these interesting details.

- The Terrace of the Leper King

Mr. Dumarcay indicated that, concerning the restoration of the Northern half of the external wall, the wall dismantled 25 years ago was almost totally raised at the end of 1994, and that the last upper courses had been raised in February 1995. Six heads have been raised after having been identified. This operation allows one to know the exact level of the upper terrace of the second state wall. This difficult work has helped training qualified and competent work-teams.

Concerning the restoration of the Southern part of the external wall, works are under way. The two parts of the external wall are joined together after 25 years of separation. In February 1995 the last superior courses of the eastern side were raised and the 6 following sides were set up with more than two meters of height. All the necessary links with the drains of the internal wall have been joined and the pavement of half of the Southern side has been done.

Concerning the restoration of the Southern half of the internal wall, Mr. Dumarcay indicated that, at the end of 1994, the last part was being dismantled in its Western end, with particular attention given on the dismantling of the original drain. The last blocks of the last side of the internal wall and the end of the laterite foundation of the external wall have been left in place. The area close to the Northern entrance of the Terrace of the Elephants has been cleared. It is being excavated in order to find an eventual link between the two terraces. This area had already been excavated in 1923 by H. Marchal, and the analysis of vestiges show the beginning of an angle turn of the internal wall towards the West. These indications will be analyzed in order to rediscover the original plan. The “libage” of the external wall stops suddenly and has to be studied further. In the North-Western angle, the filling shows special stratigraphies and analysis is being carried out to determine if there are hollows for wooden posts. Furthermore, vestiges of an ancient laterite wall in the back have been found. The ceramics found in the area show that these could be the remains of a first state of the Terrace of the Leper King in the XIth century.

These excavations bring new light upon the history of the Terrace and of the whole Royal Plaza area. The techniques of restoration allow investigations in the inside of the monument and provide new historical knowledge. This underlines the close links, in

Angkor, between archaeology and architecture and the necessity of developing research and restorations together.

The internal structural reinforcement is one of the key elements in ensuring the stability of the whole monument. It must contain the thrust of the filling, collect and drain the infiltrating water and avoid the rising of the water level by capillarity. Because of different constraints, the reinforcement of the external and internal walls are different. A watercoating (Weatherkote Type 3) has been placed to avoid infiltration. In the lower parts, a dry drain has been installed to push the waters towards the general drainage system. Currently, the foundation stone has been built until the middle of the Northern side with a coating on the whole height, and the filling of its internal side is underway. The 6 first courses of the Northern side have been put in place and the sides A to I have been rebuilt.

In order to hide the concrete coating and to show the original volume, B.P. Groslier had built a laterite wall on the upper parts of the Northern half of the internal wall. Two teams of laborers are continuing the job on the parts of the Southern half that have been rebuilt.

Mr. Dumarcay underlined the importance of the discovery of a drain and of late arrangements. He specified that the works of restoration of the Terrace of the Leper King should be completed by the end of the year and would give way to a publication.

- Banteay Kdei

Professor Ishizawa, of the Sophia University Mission, recalled that, between February 20 and March 21 1995, several studies had been carried out:

Professor Nakao carried out archaeological excavations in order to investigate the sediment layers in the Southern part of the Hall of Columns where two buildings were constructed : the actual small laterite building and in the past a wooden house for which the hole of its foundation pillar has been found. These excavations have also allowed to discover several ancient pieces (green round tiles belonging to the ancient house, fragments of potteries and ceramics).

They have also allowed to confirm the strengthening of the basis with sand, to gather the objects discovered during the excavations and to analyze them.

With the help of the National Heritage Institute of Nara and of the Cultural Affairs Agency of Tokyo, the first magnetic and electric explorations of the soil in the dry season have been done in the North-Eastern angle of the Temple.

Concerning the architectural and survey studies that he carried out himself, **Professor Katagiri** pointed out that:

- 5 levelling land-marks with concrete poles had been established in the East to West access way and 30 other plastic bench-marks, 50 cm deep. Five EFEO bench marks were in the enclosure of Banteay Kdei.

- A layout plan and a map for the levelling had been established.

- The method of grid-division for the Eastern door of the Tower had been applied.

- The 25 dangerous sectors had been reinforced with wooden poles.

- The inventory of the pieces needing restoration had been done and the restoration methods used at the time of EFEO had been studied.

Several other studies have been carried out in the same period:

Professor Moriai, in the framework of a soil and geological study, carried out underground plottings 40 meters deep and even 100 meters in two spots, one near the Eastern door, the other near the Northern door of Banteay Kdei for the study of underground water reserves and of the structure of the soil during the dry season. This has proved that in Banteay Kdei, the first ground water is 5-7 meters deep and the second ground water, 40-50 meters deep.

Also, thousands of samples have been collected for analysis and study of the geological structure. A study of the buildings and the ground, to examine the relationship between the ground and its unequal sinking, has also been carried out.

Doctor Lao Kim Leang, in the framework of an ecological and environmental study, has carried out an analysis of the quality of water from the wells and from the Siem Reap river. This study allows a follow up since 1989. He also carried out a study on the conditions of living of the inhabitants and of the environmental problems (vegetation and deforestation).

Professor Ishizawa also pointed out that the cleaning work at Banteay Kdei had been carried out in collaboration with the Conservation Office from February 27 to March 21 1995.

Professor Ishizawa concluded his statement on the on-going works at Banteay Kdei by evoking the Scientific Days that have been held with EFEO in the middle of March with the participation of 17 French and Japanese researchers. He also indicated that the architecture team will prolong its mission from March 22 to June 21 1995 in Siem Reap in order to establish a layout plan, a levelling map and the method of grid division on the Northern door of the tower of Banteay Kdei.

H. Exc. Mr Son Soubert, Second Vice- President of the National Assembly, underlined the interest of unity in the work and in the methods used and wished that

countries or institutions that begin restoration of a monument, could dedicate themselves totally to it. He recalled that monuments such as the Baphuon or the Terrace of the Leper King respected a rule of unicity. He also recalled that in terms of research and archaeological studies, there were methods to respect.

H. Exc. the Minister of State agreed with these words and wished that the same methods be kept. He underlined the results of this research that is continuing.

Mr. Beschaouch underlined that in terms of archaeological research, there was only one method and that all participants must rely on it.

- Restoration of Angkor Vat's causeway dike (Western part)

Mr. Ros Borath, Counsellor of the Minister of State, underlined that this was the first restoration work site in which the Royal Government of Cambodia intervened with staff from the Angkor Conservation Office and that it would be carried out with assistance from Sophia University.

Professor Ishizawa recalled the principles of this restoration that is aimed at recreating the original form of the part restored, by using ancient architectural techniques.

When executing the works, the original form and the ancient construction techniques will not be changed. If it appears necessary to use modern techniques or additional materials for the restoration of some parts, they will have to be distinct from the parts restored with traditional methods and materials.

The work will consist of restoration (with the necessary additional pieces of stone) of the sandstone, laterite and stone parts of the surface and of the laterite wall of the causeway (including the central terrace) in order to guarantee durability for more than 100 years.

On the basis of the results of the study carried out in December 1993, a study has been conducted from April 29 to May 7 1994. It has allowed for precise measurement of the Western entrance (surface and vertical plan of the Northern side), to verify the internal structure of the causeway and to carry out studies in masonry techniques.

Verifications, which must be continued, have been implemented between August and September 1994. These dealt with the capacity of resistance of the ground (inside the causeway and the lowest part of the causeway), the nature of the ground (natural or filling-up) as well as the archaeological study of the lowest part of the causeway (how was this part built when it was originally constructed ?).

The work will be organized according to the following process:

- establishment of plans;
- definition of concrete principles for the works;
- definition of the field in work-zones;
- drawing of the budget.

The approximate financial estimation (amount to be confirmed according to data that will be obtained) covers the building materials - sandstone (a total surface of 1250 sq. meters), laterite, blocs of laterite (the laterite wall represents 770 sq. meters), sand, gravel and earth - as well as the work force for the construction works (except other various works and the materials).

Professor Ishizawa underlined that the reconstruction works must not be based on suppositions but on concrete existing elements. The use of cement will be limited as much as possible and the tools will be built in the Angkor Conservation Office. Masonry internships will be organized to raise the technical level of specialized workers. These works will be done with human force except for some cases in which mechanical force will be necessary (transport and lifting of blocks).

After having indicated that it will be necessary, in order to stop further decaying of the stone, to study the utility of using reinforcing substances, Professor Ishizawa presented the planned organization of restoration works.

The works will be carried out in three years and the field divided into three zones.

Building materials and work force will be provided by the Cambodians.

The studies, elaboration, technical advice and supervision of the works will be done jointly with staff from the Angkor Conservation Office and from the Sophia University mission that will also try to find the appropriate fundings.

Professor Ishizawa recalled that the works will help rediscover and develop traditional techniques and will provide young Cambodian technicians with training opportunities.

He pointed out that the project should help develop professional training.

He also insisted on the symbolic aspect of this project that is aimed at having Cambodians restore Angkor Vat, the monument that represents the unity of the Cambodian people.

Professor Ishizawa recalled the assistance proposal presented by the Japanese experts and indicated that the retained proposal was the most appropriate as:

- the Cambodian workers and technicians could carry out the works under supervision by the Angkor Conservation Office;

- the works will allow young Cambodian technicians and craftsmen to enrich their technical knowledge and will provide them with training opportunities;

- this worksite, that will help rediscover traditional techniques, will lead to a renewal of the Angkorian civilization and contribute to the restoration of the self-confidence of the Cambodian people.

The Minister of State underlined that these were the first works carried out by Cambodians and according to traditional techniques. He also pointed out the important training aspect of this project.

- Preah Khan

Mr. John Stubbs, Program Director at the World Monuments Fund, presented the guidelines of the project conducted by **Dr John Sanday:**

“The World Monuments Fund’s team carried out a three week mission in January 1995 during which the work to be done has been planned. Two sites was identified for the accomplishment of architectural consolidation works:

- North-Western Portico of Gopura East IV

- Part of the structures of the Hall of Dancers.

The surveys for this Hall have been done and a group of students is currently drawing the plan of sections and elevations. A survey is also being done for the 72 sandstone Garudas that are placed around the enclosure wall.

The clearing of brushwoods around Neak Pean has continued and a group of students is surveying the site.

In the framework of its activities, the WMF has also organized a visit of the work for its Board of Directors and the donors.

Several of them have also participated in the Chiang Mai Conference during which Mr. Sanday presented the WMF work at Preah Khan.

The mission led by Mr. J. Sanday included Mr. Gavrilovic (structural consolidation), Mr. Lee Sarring (archeological surveys), Mr Yismut (environment) and Ms Singer (stone conservation).

Mr. J. Stubbs, Program Director, accompanied this mission that also included 6 students -- 5 architects, Mr Lek Sareth, Mr Var Maurin, Mr Chhoun Soma, Mr Sam Khimheng and Miss Cheam Phally, as well as an engineer, Mr. Neth Ollyna.

These students assisted the experts in the studies and researches carried out on the North-Western Portico, Gopura East IV and in the preparation of the documents for the Hall of Dancers.

Thanks to ILO and the demining group, the Eastern entrance road has been opened and it is now possible to come into Preah Khan by the East and to see without danger the beginning of the Preah Khan Baray. The WMF team has also cleared the Procession way and delimited an axial path on the East. The jetty has also been cleaned which will allow the carrying out of archaeological research in this sector.

Thanks to a donation by the Pacific Asia Travel Foundation, the WMF has built a small visitor center. Built with traditional materials, this Center informs the visitors about the on-going work.

A leaflet on the Preah Khan environment has been prepared by a Cambodian member of the team, expert in forest and environment. This leaflet is free.

Considering the decay on the North-Western Portico of Gopura East IV, emergency consolidation work is being carried out.

The surveys and detailed plans of the Hall of Dancers are under way and some restoration work has already started with techniques presented in earlier reports.

The reconstruction of the collapsed part of the enclosure wall is being examined to determine the necessary techniques.

Apart from the maintenance work for which a weed-killer has been tested, clearance work on the site of Neak Pean has started.

The WMF is also very concerned with the building of toilets at the end of the Western axial entrance to Preah Khan, and has informed UNESCO and the Royal Authorities of this apparent non-respect of the rules protecting the site. The utility of this service is not contested but it would be better to build them in a more discreet manner.

H. Exc. Mr. Son Soubert wished to be given some details on the restoration techniques used, particularly on the use of sandstone as some stones seem to have been cut.

Mr. Beschaouch regretted that the stones had been cut and put back in place. He also pointed out to the representative of the WMF the security problems concerning parts

of this work site as the reinforcement of some fragile structures do not seem strong enough.

Mr. Stubbs recalled that the propping up was temporary and said that he will ask Mr. Sanday to provide the members of the Committee with all necessary details during the next meeting of the Committee.

On the Minister of State's request, Mr. Stubbs recalled the WMF project for security at *Banteay Srei* and indicated that a complete proposal will be submitted shortly.

- Preah Ko

Mr. Janos Jelen, Head of the Board of Directors of the Royal Angkor Foundation, recalled the works accomplished during the first phase and underlined the crucial input of digitalization.

Mr. Jelen handed over to the co-chairmanship a summarized presentation of the works accomplished, thanks to funding by the Federal Republic of Germany, during the 1993-1994 and 1994-1995 campaigns (this document and the one dealing with the archaeological research conducted by **Dr Elizabeth Moore** is annexed to this report).

H. Exc. the Minister of State recalled that the project had been approved by the SNC, and thought that it should be enlarged as the planned fundings were not sufficient to ensure the reinforcement of the brick support of the masonry on which the stuccos have been affixed.

In this respect, the Minister of State recalled his wish of global projects for the monuments with orders of priority to prevent "bit by bit" approaches. Concerning the planned archaeological studies on pre-Angkorian periods before Roluos, it would be useful to make sure that they take into account, in the next phases, the whole of the monument and reach, at Preah Ko, a level similar to what is requested for other monuments.

Mr. Jelen recalled that this was, from the beginning, an emergency intervention on the stuccos and underlined that it was not possible to consider fixing the stuccos without taking into account the whole structure.

After having pointed out the complexity of this monument which necessitates caution, he recalled that this project was in its second phase and said he hoped that there will be enough funds. In this respect, he pointed out that six pillars were close to ruin and that a priority must be determined between the fixing of the stuccos and the restoration of the structure.

Mr. Beschaouch underlined that no project document had been presented according to the format for the current phase and recalled that it should be presented to the Committee before the beginning of the work.

Mr. Jelen indicated that it will be shortly handed over to the Committee.

Concerning the importance of the work that had to be done at Preah Ko, Mr. Beschaouch considered that the following must be recommended :

- the enlargement of the project so that an approach of all the needs in terms of restoration and conservation of this monument be taken into account;

- an extension to other expertise to take in charge the works that the existing team could not carry out.

Recommendation of the Committee

The Committee recommends that the project document dealing with the current phase of the works on Preah Ko be presented according to the format.

The Committee recommends that a global project for the conservation, restoration and development of the Temple of Preah Ko be prepared and presented.

- Royal Palace

H. Exc. Mr. Taufik Rachmann Soedarbo, Indonesian Ambassador, recalled the main guidelines of the project of restoration of the South-Eastern door of the Royal Palace.

According to the statement made during the Tokyo Conference, the Republic of Indonesia confirmed its assistance proposal to the safeguarding and restoration of the site of Angkor by proposing a restoration project for the South-Eastern door of the Royal Palace.

At the end of the preparatory mission that was fielded in August-September 1994, a report presenting the results of the studies carried out and the main guidelines of the restoration-training project, that the Indonesian Government proposes, has been handed to the Royal Authorities, to the Co-chairmen and to UNESCO.

This project foresees an initial training phase, in Indonesia, for 2 or 3 technicians. This theoretical and practical training will allow these technicians to be integrated in the restoration team and to fully participate in this anastylosis project, scheduled over 12 months.

The project proposal, with an estimated cost of US\$ 145,000, foresees the fielding of a 24 member team.

Apart from the recollection of documents (surveys, maps,...), a system of classification of the stones, studies of the soil, installation of a camp, of workshops, etc., the following activities will be included:

- a complete dismantling of the structure;
- the construction of a concrete flagstone;
- the setting up of a waterproof layer;
- activities of stone conservation: cleaning, repairing, consolidation;
- anastylosis of some blocks;
- reconstruction with a concrete reinforcement;
- a system to fix the stones and reinforce their cohesion;
- the replacement of missing stones by new ones, geometrically cut and marked in such a way as to distinguish them from the original ones;
- the reconstruction of the roof.

This is a three-phase project:

- preparatory work (equipment, materials, research, documentation, measurement and surveys, installation of a camp and of various workshops and a place to store the stones, finding of the new necessary blocks, a system of classification of the stones, etc...)
- restoration work using anastylosis (dismantling, conservation of the stone, flagstone, reinforcement, waterproofness, rebuilding)
- finalization (drainage, cleaning up)

H. Exc. the Ambassador indicated that part of the Indonesian experts will arrive in the middle of April to prepare the work-site and finalize the project on the field. He pointed out that the work-site would be officially opened on May 15, 1995, in the presence of the Director for Cultural Affairs.

The Minister of State and the Co-chairmen thanked H. Exc. the Indonesian Ambassador and expressed satisfaction in view of the opening of this new restoration work-site in the near future.

- Restoration of the Temple of Baphuon

Mr. Dumarcay, Project Manager, recalled the moving ceremony when His Majesty the King inaugurated the work on February 21 1995. He then outlined this project undertaken by EFEO.

The Baphuon project was for a long time the largest one undertaken by EFEO in Cambodia. The work started with simple propping work in 1930, and it was not until 1960 that B.P. Groslier undertook a systematic restoration based on a well prepared plan.

Due to a number of collapses, the structure was completely dislodged and Mr. Groslier conceived the idea of an internal support wall which would absorb all strain, yet remain hidden behind the facing which would no longer be under pressure.

By its simplicity of concept, this technique facilitated a rapid reconstruction of most of the foundation of the first floor and of the first level of the foundation of the second floor of the northern and eastern sides.

The current work is in fact simply the continuation in broad terms of this same project with certain modifications, some due to circumstances and some as a result of a new approach to the restoration of the monument.

The construction of Baphuon was completed in 1060. The monument was designated for the cult of Siva and housed a linga, expression of the creative force of the god and by extension of the king who was to some extent his manifestation.

In the course of time, Buddhism became the dominant religion in Cambodia. Thus at the end of the 15th Century and at the beginning of the 16th Century a large labor campaign was organized which profoundly altered the monuments of Angkor and of Baphuon in particular. This last, which was not in good condition -- a large number of the coronation bands had collapsed -- was converted for use by the Buddhist cult and the second level of the foundation of the second story was transformed along the western facade into a colossal reclining Buddha over sixty meters long.

In the original restoration project conceived by B.P. Groslier, the Buddha would not have been preserved for reasons which today no longer seem relevant (a drastic alteration of the architecture of the 11th century which loses the unfolding beauty of horizontal lines on three sides).

In the actual project, the reclining Buddha will be restored, emptied of its core, covered with a lighter facing, replaced by a reinforced concrete shell which will allow enough space on the inside to reconstruct the 11th century gallery.

Thus not only will the history of Cambodian architecture be illustrated, but also its religious evolution .

Mr. Dumarcaay underlined that the reconstruction required a lot of precision because the architect will in no manner be guided by the structure. The IGN was requested to conduct a photogrammetric study of the reclining Buddha. The photographs were taken from February 6-11 1995, and the final study should be submitted during the month of May 1995.

These works were completed with data taken by the EFEO bureau of graphics in Siem Reap and will be conveyed to a well-known reinforced concrete engineer, most likely Japanese, who will calculate the measurements of the structure that needs to be put in place.

In addition to the measurements of the reclining Buddha that were taken, IGN constructed a polygon on the first level of the monument which will allow the operation to take place with even more precision.

With regard to the "champ de dépose", Mr. Dumarçay described the abandoned state it had been found in which resulted in requesting the assistance of a firm, Studio Cerezales, specialized in this type of management.

After conclusive testing in 1994, on-site operations began and a large computer center was set up in Siem Reap which his Majesty King Norodom Varman honored with a visit.

Studio Cerezales has already completed a typological inventory of the settling profiles of all the foundation stones, thus providing a record of profiles that is easy to access on the work site.

Thanks to a computer graphics program, similar profiles can be compared and the selection of stones for a profile has been accelerated. We have carried out a precise survey of the "champ de dépose" and established a system of coordinates, which allows for rapid location of the stones.

Work on the site started in the area where the stones from the collapse of the North-Eastern corner were piled up, dating from 1943. The selection of forms resulted in the discovery of a number of foundation stones on the second level of the second storey.

Initial results, and especially the speed with which the results were obtained (Mr. Cerezales has only been on location since February 1995) is a promising sign for the identification process.

With regard to work being done on the monument itself, work was started on the Southern facade of the Eastern side (second level, floor two). The worksite has been completely reorganized and necessary equipment has been put into place (e.g. an 18.5 meter crane with a 20 meter arm).

After dismantling the foundation stones, which were placed in 1970, and cleaning the supporting wall, the process of replacing the blocks was able to begin. This work, which should take 4 months, will be continued on the eastern side and around the southern side. Upon completion, the reconstruction of the second storey entrance pavilion (on the Eastern side) will be undertaken which will allow for the preparation of teams to rebuild the structure.

Mr. Dumarcaey concluded his statement indicating that as soon as a second crane is obtained and the EFEO and IGN drawings can be verified, the reclining Buddha will be dismantled and the stones will be sorted. This work, which will be done by the Studio Cerezales for the most part, will enable the reconstruction of a large part of the superstructures of the galleries of the first storey of the foundation. Thus, at the next Committee meeting it will be possible to present a complete project for the reconstruction of the reclining Buddha and views of the rebuilt structures concealing the reinforced concrete of the Eastern side (visible today).

B) - NEW PROJECTS

- Masterplan for the Preservation, Restoration and Development of the Monuments of Angkor

Regarding the recommendations of the Royal Government to include each of the large priority activities of the Emergency Plan in a masterplan, **Mr. Beschaouch** indicated that it would be possible to put together a Masterplan of the Preservation and Restoration of the Monuments, based on available existing reports, similarly to what has been initiated by UNESCO for Borobudur and Nubia.

He indicated that a list would be put together and proposals presented during the October meeting of the Committee. Mr. Lemarchand will be the coordinator for this project funded by UNESCO.

The Minister of State indicated his hope that the plan would be put together on schedule.

Opinion of the Technical Committee

The Committee favors the elaboration of a Masterplan of the Preservation, Restoration and Development of the Monuments of Angkor which will be presented at the next meeting of the Committee in October 1995.

- Angkor Conservation Office Assistance Project

Mr. John Stubbs, WMF, outlined the assistance proposed by the World Monuments Fund and by Dr. John Sanday on an earlier occasion to revitalize the Angkor Conservation Office.

Mr. Beschaouch underlined that offers of assistance were welcome, and that the initial budget for that project was U.S.\$70,000. WMF was offering to finance

U.S.\$26,000 and so it was necessary to find funding for the remaining amount. In this respect, he inquired whether WMF would object to other donors being involved.

In addition, **Mr. Beschaouch** pointed out that the support proposed by WMF was mainly for the purchase of equipment and inquired whether the equipment would revert to the Angkor Conservation Office or whether it would be merely deposited with them while remaining the property of WMF.

His Excellency the Minister of State thought that this proposal should be reviewed and set into operation to take into account the establishment of APSARA and invited WMF to contact the APSARA representative when he is selected..

- International Scientific and Technical Documentation Center

Mr. Beschaouch recalled that the Safeguarding of the site of Angkor requires the coordination of activities but also the establishment of a structure which allows participants to access scientific and technical documentation, worksite equipment, specialized personnel, and basic supplies.

The creation of an International Center responds to the following objectives:

- to design, develop and manage a depository of technical and scientific documentation on Angkor and the region;
- to provide access to documentation to researchers, experts, institutions, national and international organizations, and governmental and non-governmental international agencies involved in the safeguarding of national and cultural heritage of Angkor and the region;
- to offer experts scientific, technical and human resources to respond to the needs of the plan to safeguard the site and the region;
- to organize seminars, colloquia, and conferences;
- to train specialized personnel in the areas of documentation, computer programming, and the preservation of monuments and sites all the while organizing programs for study, research and worksite restoration;
- to publish a newsletter with updates on current work being done at Angkor, in Siem Reap and in the region, with general news about the site and the region, as well as to publish educational and cultural brochures and organize a program of cultural activities.

For the creation of this Center an appeal must be made for the participation of national authorities as well as the international community in the areas of documentation as well as technology.

The duration of the implementation of this project is estimated at three years to open the Center, including training of specialized personnel and the organization of the different units.

Established in the heart of the Conservation of Angkor, this Scientific and Technical Documentation Center should bring together the entire collection of documents, old and new, on Angkor and Siem Reap. The Center will provide national and international specialists with available information on conservation and preservation as well as the services of a Technical Unit and Photographic Laboratory, thus contributing to the research and safeguarding activities of the monuments of Angkor.

The Center will be installed in building no.27, which has been put at its disposal by the Royal Authorities and which is in the process of being restored with funding from Japan. The location of the technical unit has yet to be specified.

The Center will be comprised of five units: an administrative unit and four technical units.

With regard to the *documentation*, most of the existing documentation is currently at the EFEO office in Paris and covers the period from 1908 to 1973.

Thanks to Japanese sponsorship, a portion of this documentation is available on microfilm at the National Museum of Phnom Penh, where EFEO publications and the Ecole Française d'Extreme Orient Bulletins are also located.

The photographic inventory of items that have been catalogued could be completed with the photographs available at the National Museum of Phnom Penh.

A CD-ROM of old photographs would allow researchers and experts working on the site to access to available photographic documentation of the Angkor/Siem Reap sites.

Very few documents currently exist in Phnom Penh on restoration work that has been done since 1986 and few are accessible. However, a few copies of numerous audiovisual recordings made over the last few years do exist.

The *Geographic Information System (GIS/SIG)* is equipped with data from the ZEMP project which is regularly updated. Since November 1994 Cambodians have been receiving training on the GIS. The Geographic Information System should thus soon be operational for the Center.

The Photography Unit, which is operational thanks to funding from Luxembourg, will proceed with the archiving of data since 1986 and will be at the disposal of experts working on the sites.

None of the structures of the *Technical Unit* established between 1960 and 1970 continue to exist. The laboratory which was built in the EFEO enclosure has disappeared. Given the importance of ongoing and planned work, it is essential to plan for and set up a Technical Unit within the Angkor Conservation Office, within the framework of the International Documentation Center.

This Unit will train Cambodian specialists and provide technical assistance in documentation, science and technology to the different technicians and specialists, both national and international, working on the sites.

Taking into consideration the current state of scientific information on the conservation of construction materials, it seems useful to include in the workplan of the Technical Unit a research and training program with the aim to propose preventive and curative measures and a selection of products notably for the destruction of vegetation, and the consolidation and restoration of stone, brick and laterite.

These programs could equally cover aspects concerning construction material - identification and analysis, situation of the quarries, research on various types of mortar used, adaptability of new materials -- structure and stability.

To this effect, the various work, studies, and research done since 1975 and currently ongoing by specialists in the field will be taken into consideration.

A laboratory mainly dedicated to geophysical aspects could be opened up for all national and international technicians.

Research results and studies undertaken by the Technical Unit will be an integral part of the International Center and will facilitate the work of everyone who is participating in the work of safeguarding the monuments, thus ensuring the necessary transmission of information.

To summarize, the International and Technical Documentation Center aims to create four operational units with trained / specialized staff:

- 1) *A Documentation Unit* which would be staffed with a librarian document specialist, an assistant librarian, a computer programmer, and a library archivist, and which will provide scientific, technical and computer documentation as well as audiovisual archives and documents on Angkor and the region. The Center will network with other documentation centers such as ICOMOS, ICCROM, ICOM.

This Unit should equally have a library / data collection section on Cambodia and Khmer culture, a scientific and technical section relating to research and studies on the site and the region, a computer information section facilitating access to historical, scientific and technical information, and disposing of a standardized data base including everything that concerns the inventory and engineering of the structures, and finally a section of photographic archives and audio-visual documents which will be responsible for collecting old documentation up till 1986 as well as films and videos produced on Angkor.

2) - *A GIS/SIG Unit* which could be staffed with a GIS/SIG geography-cartography specialist, a GIS/SIG computer operator and a coder, and a GIS/SIG data specialist. The Unit would provide access to spatial graphic (or non graphic) data on Angkor and Siem Reap.

These two units will be responsible for the training of document inventory technicians, librarians, and computer data specialist in the framework of international exchange programs.

A newsletter will be regularly published by the Center to keep people informed of the works and research activities being done in Angkor and educational publications will also be produced.

3) - *A Photography Unit* which could be staffed with a photographer, an assistant photographer, and a laboratory technician. In addition to photography and lab development activities, this Unit will serve as a photo library, collect aerial and satellite photos, and archive photos taken since 1986. The Unit staff will be at the disposal of the Angkor Conservation Office and of experts to take pictures of the monuments and sites before and during restoration work. This Unit will also be responsible for making duplicates of old photographs, starting with the monuments that are currently being restored. In addition, this Unit will undertake the job of taking pictures for photogrammetric reconstruction and surveys.

4) - *The Technical Unit* will be staffed with 1 engineer, 1 architect, 2 technicians and 1 chemist, and will include a laboratory and a geophysical workshop, as well as restoration, carving, polishing, and molding workshops. Specialized personnel will be trained to track the monuments and conduct necessary analyses according to elaborated technical and scientific recommendations.

A training program will be established as well as a data bank on construction materials, technology and conservation, causes of damage and precautions.

With an aim to train senior managerial staff and experts and to offer Cambodian and international worksite professionals technical recommendations and scientific data to respond to urgent issues or more general ones (materials, methods, preventive and curative treatments, cleaning methods), this Unit will be divided into four sub-units:

- a research laboratory for analysis, research and control of materials, treatment products and methods of application. The laboratory will be responsible for the supervision and follow up of the application of treatments. It should focus on additional geographic and petrographic research as well as a study of materials (ground, masonry work and foundation of superstructures). In this section vegetation could be studied, in collaboration with the Provincial Department, in order to propose preventive and curative treatments and/or a methodology to destroy the vegetation encroaching the monuments.

- a geotechnical workshop bringing together all available geotechnical data of the sites.

- a sculpture, artifact and pottery restoration workshop.

- a workshop dedicated to copying lapidary inscriptions at the Conservation Office or on site, allowing the Documentation Unit to enrich its information base.

- a workshop to refine molding and reproduction techniques in order to avoid damaging the stone so that important sculptures (some of which are being altered) can be measured.

UNESCO reiterated its support for the project by the provision of financial and technical assistance. UNESCO will provide a technical advisor to the Center to assist Authorities with the different activities of the Units. UNESCO will assist with the training of personnel and will provide the support of its offices in Cambodia. Bilingual (French/English) international experts with knowledge of Cambodia will participate in the initial phase and will be progressively replaced with newly trained nationals within the scope of the project. They will work together closely with the Institute of Khmer Studies, libraries and documentation centers, as well as with international scientific institutions in order to avoid duplication of efforts. Khmer translation of technical documentation will equally be contemplated.

The Center will also have close relations with national and international institutions, both public and private, concerned with the safeguarding of Angkor and able to bring their assistance to this multi-disciplinary project.

Opinion of the Technical Committee

The Technical Committee favors the general scope of the creation of an International Documentation Center and invites UNESCO to pursue fund raising efforts for its effective establishment.

- The CONTACT Method

This project presented by the Royal Foundation for Angkor aims to conserve buildings and restore wall carvings and art objects made of stone, wood, and ceramic according to the method known as CONTACT.

- Hydrological and Climatic Description of Angkor

This project aims to produce a climatic and climatological description of Angkor and the region surrounding Siem Reap in order to give recommendations for:

- the restoration of palaces, basins and parks;
- all the teams engaged in restoration and conservation work;
- reconstruction of the airport and efficient charting of flights
- air, road, and water transport;
- fishing and agriculture

Mrs. Tatiana Proskouriakova, President of the Royal Foundation for Angkor of Russia, made the following statement:

"Mr. Chairmen,
Excellencies,
Ladies and Gentlemen:

First of all I should like to thank the Co-chairman of the International Co-ordinating Committee from Japan and the Co-chairman from France for their invitation.

After the inter-governmental conference which took place on October 12 and 13 1993 in Tokyo on "Safeguard and Development of the Historic Site of Angkor", and with the help and direct participation of the Russian National Commission for UNESCO, of the Academy of Architecture and of the Russian Ministry of Culture, the "Foundation for Angkor" was established in Moscow.

Our main directions are:

- research on the history of civilization of Angkor;
- scientific research on the history and the theory of architecture of Angkor;
- research on the questions of safeguarding the monuments of Angkor;
- the study of the ancient Khmer language.

This is what we can do:

- scientific research;

- design of a reconstruction project of the monuments (or parts of them);
- provide expertise on reconstruction plans, projects, and restoration works;
- graphics and technical documentation analysis. For example: calculation of the original sizes of missing parts of the monuments or towers or the base part of the tower using principles of proportion and the system of modules used by medieval Khmer architects.

We stress that the research activities must be continued as many groups of monuments still retain some of the secrets of harmony of architectural composition to this day.

The system of modules and the proportions of "gold section" of the medieval Cambodian architecture open a new era in the history of culture of South-East Asia. Previously this concept was valid only for Western architecture, but now is true for Eastern architecture as well.

I think that the Angkor heritage has contributed greatly to the theory and history of the architecture of the world.

We hope that our research may be interesting to you and will successfully cooperate in the future to the benefit of the world culture.

Thank you for your attention."

Mr. Guennadi Chevelev, Counsellor to the Embassy of Russia, specified:

"We estimate that Mrs. Tatiana Proskouriakova's project, presented by Russia during the meeting of the Technical Committee on October 8 1994, and accepted by the Committee as assistance from the Russian Foundation (of which Dr. Proskouriakova assumes the presidency) must be considered a continuing project.

For this reason we propose to the Committee to integrate this project into research activities on the monuments of Angkor, as well as into the various expert restoration activities in order to avoid distorting ancient architectural construction concepts.

This continuity marks our attachment to the heritage and the work of our compatriot, V. Goloubev, who worked with UNESCO.

With regard to the two other projects presented today, I would like to specify that they were designed with the creation of work teams and creative groups in mind in cooperation and with the direct participation of trained Cambodians who have completed their studies in Russian, be it in Cambodia or in Russia.

We have no doubt of the qualifications and efficiency of our experts, which is widely recognized, to manage these projects and are sure that they will assume the duties successfully.

One of the experts has directed Cambodian hydrometeorological training in Phnom Penh for 5 years and is committed to the protection of Angkor.

The experience in applying the CONTACT method to monuments and works of art in the extreme climatic conditions of Russia prove the effectiveness of the method.

One issue which concerns us, is the inability of "Russian Foundation for Angkor " to find funding for its activities. Nevertheless we hope members of the Committee who have already indicated their interest in these projects will find ways to integrate them into current programs concerning the safeguarding of the monuments of Angkor and of Cambodia's cultural artifacts.

The Russian projects, notably those of the "Angkor Foundation ," do not involve specific monuments as the Japanese, French and other projects do. Our experts have elaborated offers for services in the hope that they will be well received by others participating in the safeguarding and development of the Angkor site who may contribute concretely to their fulfillment.

With this in mind, we hope that countries and organizations interested in the cooperation and assistance that the Russian experts can offer contact our delegation as soon as possible, specifically Mrs. Tatiana Proskouriakova who will remain in the country a few more days.

In closing, I would like to inform you that Russia and the "Angkor Foundation" are designing a number of hydrogeological, epigraphic, and ancient Khmer projects which will be presented to you in the future.

Thank you for your attention.

His Excellency the Minister of State thanked Mrs. Proskouriakova and Mr. Chevelev for their statements and recalled the quality of the Russian experts who know Cambodia well. He highlighted the interest in international professional participation. In this respect, he evoked the United Nations Volunteer (UNV) project.

Mr. Beschaouch proposed that a UNDP/UNV project be elaborated which integrates the themes presented by the Russian Federation and the "Angkor Foundation for Russia", and which could employ Russian experts as Volunteers.

Opinion of the Committee

The Committee proposes to submit to UNDP/UNV the idea of developing a UNDP/UNV project centered on the themes presented by the Federation of Russia and

the "Angkor Foundation of Russia" in which Russian experts could be recruited as volunteers .

- Organization of international action

Mr. John Donaldson, Office of International Standards and Legal Affairs, UNESCO, recalled that given the number of works that are either under way or planned for Angkor, the question arises as to how to ensure *the protection of people (visitors, employees and workers) and of equipment* on the different work sites.

The question can be more specifically addressed by finding out which is the most efficient way to ensure that construction companies who are contracted to do the work assume this responsibility. In effect, companies usually cover hazards on the sites. In civil construction contract language, the companies are usually identified as the "entrepreneur."

Mr. Donaldson specified that international practice in this matter is reflected in the civil purchase order contracts adopted by the Federation of Engineering Experts.

Risks which can normally be placed under the responsibility of the entrepreneur are those that are caused by or linked to works, such as accidents, damages and losses undergone by equipment or people, including the public and the monuments themselves (security of people and equipment, protection of the environment, maintenance of proper working conditions, responsibility for rectification of losses or damages, with the exception of disasters).

The entrepreneur is not only required to assume these responsibilities, but must carry adequate insurance, including covering the cost of works and equipment. In addition, the company is required to carry third party insurance, including the equipment of the Contracting Agency - in this case the Kingdom of Cambodia).

Accidents and physical injury undergone by workers must also be covered by the Entrepreneur.

The Entrepreneur is required to furnish proof of insurance coverage before any work starts and that the insurance company must be approved by the Contracting Agency.

In cases where there is no specialized insurance company in Cambodia, insurance policies can be obtained from large international firms.

In case an Entrepreneur does not carry adequate insurance, the Contracting Agency will have authority to obtain insurance and deduct the costs of the insurance premium from the Entrepreneur's fee.

Mr. Donaldson underlined that the outcome of this model of international contract is that the risks and damages to people and goods (except those caused by the Contracting Agency or by disasters) can be made the responsibility of the Entrepreneur.

If the Contracting Agency is the Royal Government of Cambodia, it will suffice to include the appropriate clauses in the contract between the Entrepreneur and the Government.

In cases when the contract with the Entrepreneur is negotiated by a Contracting Agency other than the Government, the Government must require that the Contracting Agency include the necessary clauses in its contract with the Entrepreneur. Since the Entrepreneur can only work in Cambodia with permission from the national authorities, it is they who can enforce these conditions. To this effect clear notification of the Entrepreneur's obligation to assume liability should take place at the beginning of any negotiation, and the authorities should be associated to the establishment of a contract to ensure that all required precautions are taken. Thus it would be wise to monitor works which are about to start and renegotiate, if necessary, contracts currently in effect.

Mr. Porcell underlined additional difficulties caused by the lack of existing legislation in Cambodia on insurance and on problems of management of disagreements. Mr. Donaldson recalled that international companies could handle the disagreements, and evoked the role of international organizations regarding liabilities.

After His Excellency the Minister of State referred to the Convention concluded between UNESCO and Cambodia, Mr. Donaldson specified that this Accord only relates to works done by UNESCO and its subcontractors. UNESCO requires basic coverage as required by the authorities in its requests for bids to subcontractors.

Mr. Beschaouch underlined the role of APSARA and the close cooperation that will be necessary.

He recalled that UNESCO needed to complete the file **check** on the *organization of international action* of the elements concerning *security on the work site*.

Regarding the *standardization of salaries*, Mr. Beschaouch indicated that the issue was raised of elaborating a salary scale. The scale could include 3 or 4 professional categories with fixed salaries according to competence and required skills. To this effect, APSARA could prepare the salary scale which would be circulated to participating organizations every year.

- Technical Reports / General Recommendations

Mr. Beschaouch summarized the Angkor ad hoc Commission mission which took place in November 1994. He reminded participants that the Commission had been put together by UNESCO at the request of the Committee.

The Commission, made up of 3 internationally renowned experts, visited worksites of ongoing or planned activities with representatives of the projects.

Thus, the Baphuon file was examined as a priority and remarks communicated to Mr. Dumarçay.

Regarding the ongoing work at Prasat Suor Prat, the Northern Library of Bayon, and the Northern Library of Angkor Wat, the experts applauded the relevance of planned interventions.

The restoration project presented by Indonesia was examined with Mr. Samidi who indicated that he welcomed and would take note of their technical comments.

The absence of the technical file for the Indian project was regretted.

Mr. Beschaouch recalled that the mission consisted of site visits and that the ad hoc Commission had not provided written comments. He specified that internal procedures regarding the role and mode of function of the ad hoc Commission for Angkor would be submitted to the Co-chairmen.

C) - UPDATES:

- Pre Rup Restoration Project

Mr. Beschaouch indicated that the project was being elaborated with financing from Italy, the Netherlands, NFUAJ, and the World Heritage Foundation.

- Colloquium on the Hydraulic City

Mr. Dupavillion indicated that the Colloquium organized by EFEO under the patronage of UNESCO and the Royal Government of Cambodia would take place from June 28 to July 1 1995, at Angkor.

The main themes are the following:

- The hydraulic system: archaeological studies

- Economic and social consequences of rehabilitating the hydraulic system;
- The rehabilitation of the hydraulic system and its impact on the sites and monuments;

The Colloquium will bring together around 40 specialists:

- Archaeologists and historians;
- Specialists in hydraulics, hydrology, and hydrogeology;
- Specialists in the environment and studies of countryside (humid areas);
- Economists, engineers, urban planners, developers;
- Specialists in the stability and engineering of monuments;
- Monument conservationists and architects.

Mr. Dupavillon specified that the colloquium would include a site visit, workshops, plenary sessions, and that the objective is to come to conclusions to determine whether it is desirable or not to contemplate partial restoration of the hydraulic system.

- Round Table on the Radar Imaging Survey of the Angkor Eco-site

Mr. John Stubbs, WMF, informed the Committee of the results of photographs taken from space in August and October by the NASA space shuttle. The richness of the results have led the World Monuments Fund and the Royal Angkor Foundation to organize a round table discussion at the University of Princeton in February 1995 to bring together specialists from various fields, notably Mrs. Minja Yang of UNESCO's World Heritage Center, to discuss the utilization of space imaging to develop non-damaging archaeology.

A copy of the report of the round table was distributed to participants who were able to examine a NASA space image.

Mr. Stubbs hoped that given the importance of the information provided by this space imagery, a specialized working group could be started.

Mr. Beschaouch recalled the interest in being able to use two methods of space imaging: NASA and SPOT.

Ms. Elizabeth Moore underlined the interest in working with two types of polarization.

His Excellency the Minister of State thanked Mr. Stubbs for the information and asked that he convey his thanks to Mrs. Bonnie Burnham. He underlined the interest in Cambodian participation in this type of meeting and recommended that the Committee be represented and that Mr. Beschaouch be invited.

Mr. Stubbs and Mr. Jelen gave **His Excellency the Minister of State** in addition to the images, a CD-ROM of Angkor with information on Internet and NASA's GPL.

The Co-chairmen presented their thanks with those of **His Excellency the Minister of State**.

IV - DEVELOPMENT OF HUMAN RESOURCES

A) INFORMATION ON THE VARIOUS INTERNSHIPS AND TRAININGS ORGANIZED

- GIS/Zemp project training

Mr. Ros Borath, Counselor to the Minister of State, recalled that 11 trainees, 5 from Phnom Penh and 6 from Siem Reap, were trained for 6 months. The trainees only have 4 computers and only one is equipped with Intergraph. This brings about some organization problems.

H. Exc. Mr. Vann Molyvann indicated that the trainer's contract would be extended until mid-June and pointed out that GIS/SIG would be transferred to the premises of building 27 as soon as the renovation is completed.

The Minister of State wished that the complementary equipment be quickly bought to set up two units: one in Siem Reap, and one in Phnom Penh. He underlined the importance of the premises which need good electrical equipment and an effective air-conditioning system.

Mr. Beschaouch underlined that the zoning plan was a project of the Royal Government which should be finished shortly. The report that is currently being read by the Authorities will be, when its final version is accepted translated into English, French and Khmer.

- Trainings organized in the framework of the projects conducted by the Japanese mission for the Safeguarding of Angkor

Professor Nakagawa, Head of the Japanese governmental mission for the Safeguarding of Angkor, made the following statement:

"Thank you Mr. Co-chairmen,

I would like to explain the training program conducted by the Japanese government team for the safeguarding of Angkor (JSA).

The first program was organized during the period of the fourth mission last summer and since then the training program has become an indispensable part of each mission's activities.

So far, students from the Faculties of Archaeology and Architecture, Royal University of Fine Arts, Phnom Penh, have been provided the program in every JSA mission period. The program is focused on on-site field training. For example the students of archaeology begin with how to set up measuring equipment, and followed by this are actual excavation methods, recording of exposed soil layers, classification of excavated artifacts, inventory making, etc.. One Japanese expert is attached to each trainee and needless to say, oral lectures are also provided to make the trainee aware of the importance of each step of these works.

Although training is limited to archaeology and architecture for the moment, we plan to extend to other fields of study, like geotechnical engineering or preservation sciences.

We expect a lot from these trainings, in order to facilitate technical transfer and formation of young Cambodian experts, who will take a growing part in the conservation and preservation of our common heritage, the monuments of Angkor.

Thank you."

- Restoration Training in Indonesia

H. Exc. Mr. Taufic Rachman Soedarbo, Indonesian Ambassador, recalled that training in the framework of the restoration project of the South-Eastern door of the Royal Palace was being organized for three Cambodian trainees.

This training in restoration and conservation techniques takes place from January 17 to April 7, 1995, in Jakarta, Borobudur, Prambanan and Trowulan.

It includes theoretical training (25%) in:

- cultural management;
- protection;
- preservation;
- South-East Asian archaeology.

and practical training (75%) in particular in terms of:

- conservation and restoration of monuments;
- laboratory and study of the climate;
- topometry, maps and drawing;

- system of filing of the stones;
- conservation of the stone;
- anastylosis;
- dismantling of the Temple;
- rebuilding of the Temple;
- comparative study of the conservation of bricks.

The Indonesian Ambassador indicated that these trainings that are also opportunities for discussions on general problems of conservation and restoration have allowed the trainees to visit many sites and to participate in the International Conference of experts in Borobudur between January 23 and 28, 1995.

H. Exc. Mr. Soedarbo concluded his presentation by pointing out that this training in Indonesia will be completed by an on-site training, the trainees being associated in the restoration work of the South-Eastern door of the Royal Palace in order to guarantee good transfer of knowledge.

- Training in the Faculty of Archaeology

Mr. Ang Choulean, Professor at the School of Archaeology, Counselor to the Minister of State, recalled the program to reorganize the curriculum of studies at the Faculty of Archaeology, presented during the October meeting of the Committee.

He underlined the difficulties at the Faculty to provide training as there is not enough funding to organize courses with foreign teachers. He pointed out that Mr. and Mrs. Filiosa have announced in December that they will come and provide the Sanskrit lessons that are currently lacking.

Mr. Beschaouch, after having recalled the Japanese effort in terms of teacher funding offered in 1993 and 1994, pointed out that the continuation of the funding for 1995/1996 was possible, but that the Japanese Government wished to make sure that the program corresponded to what was desired.

- The International work-site school

Mr. Dumarcay, EFEO, recalled that this work-site school has been organized following the request of the Royal Government.

The main theme of the program, linked with the launching of the works on the Baphuon, was "the restoration of a monument and its environment." The EFEO benefited from the collaboration of the University of Paris III and Orstom.

Sixteen Cambodian students from the two Faculties have been selected by the Deans and UNESCO (9 students from the Faculty of Archaeology and 8 from the Faculty of Architecture).

After an introduction course by Mr. Beschaouch, UNESCO, on the problems linked to the restoration of a monument and its environment, the training program was organized as follows:

- from February 22 to 25, the various aspects of Khmer architecture were explained during three very detailed visits to EFEO's work-sites in Angkor, under the guidance of Mr. Dumarcaay (Baphuon with Mr. Royere and the Terrace of the Leper King with Mr. Pottier).

Particular attention was brought upon the problem of architectural surveys (Mr. Papelard) and the management of a "champ de dépose" (Mr. Cerezales).

- the second session was led by Prof. Dagens, University of Paris III, in the morning, and Mr. Dupon, Orstrom, in the afternoon.

Professor Dagens focused on what is known of Khmer monuments and how they must be described, and Mr. Bruguier, the history of techniques.

Ms. Hawixbrock spoke on iconography and architecture and Mr. Ang Choulean on the transition from temple to monastery.

The teachers of Orstrom dealt with environmental questions, Mr.F. Molle giving basic information on hydrology and Mr. Beaudou on podology.

Mrs. Semah showed through her specialty, palynology, that archaeology was a multi-disciplinary science. In the end, Mr. Dupon, in a broad introduction to cartography, the problems of interpretation of pictures, and of teledetection, explained that the idea of space is sometimes linked to its representation on a given scale.

- in the third session the students debated and summarized what they had learned during these days.

Mr.Dumarcaay concluded his statement by underlining that this work-site school has allowed discussions on many problems, quickly, but in such a way that the students have had a global perspective on the problems of restoration of architectural works.

He underlined the motivation of the trainees and warmly thanked Mr. Ang Choulean for his competence in the translation.

The representative from SPAFA, Mr. Chareonwongsa, made the following statement:

"As a SEAMEO Regional Center for Archaeology and Fine Arts, of which the Kingdom of Cambodia holds a country-membership status in collaboration and cooperation with eight other member-countries, SPAFA, since its establishment over 20 years ago, has been regularly conducting academic activities such as training, seminars,

workshops, and other related programs in the field of archaeology, visual arts, and performing arts.

In the field of archaeology, the Center has carried out programs on underwater archaeology, museology, conservation of sites and objects, as well as on management-related activities. Just this mid-month, a month - long training course on cultural tourism was concluded and unfortunately without Cambodian participation, despite the invitation to join. Within the next three months, two other related programs, one a workshop on cultural resource management to be held in Singapore tentatively, and the other a workshop on cultural tourism and its impact, to be held in Lao PDR, both activities of which Cambodia will again be invited to participate in, as it has been regularly done.

By the middle of this year, SPAFA, with the collaboration of CIDA, has allocated a slot for a study tour to Canada for a Cambodian participant on the topic of historic park management - a topic much related to this meeting's agenda. The two other Indo-Chinese countries, Lao PDR and the Socialist Republic of Vietnam have already accepted their study tour slots and are taking the opportunity for their countries' benefit. All that needs to be done is for an official delegate to fill in an application form now and everything will work to the advantage of this country.

SPAFA, by virtue of the Governing Board's mandate, has programmed a month-long training course specific for participants from the Indo-Chinese member countries on Basic Laboratory Conservation Techniques, slated for conduct at the SPAFA Headquarters building in Bangkok. The mechanics of this activity is in the process of development and the Ministries involved will be duly notified in the near future.

Through the French Government's assistance, a colloquium on museology will be held at the Mahidol University from July 3 to 5 this year, to which the Indo-Chinese countries will surely receive invitations to participate.

In conclusion, SEAMEO-SPAFA would like to suggest that the Cambodian people, through their Education Ministry, identify their needs in the realm of Archaeology by themselves, and SPAFA, with all the other assisting agencies and institutions, will then be able to effectively assist the known needs. Otherwise, it is a big guessing game for the Center, and as it has mostly been the case, the allocated slot for the Cambodian people has been left unused, and the opportunity wasted. Our hope is our Southeast Asian neighbour's hope, and their dream, our objective".

H. Exc. the Minister of State, Mr. Vann Molyvann, warmly thanked the representative of SPAFA in the name of the Superior Council for National Culture and expressed satisfaction concerning the renewal of training.

Professor Ishizawa recalled that from February 20 to 26 Sophia University has organized intensive courses for approximately 250 students from the Faculty of

Architecture. These courses have been provided by Professor Shigeeda in the framework of the 15th mission.

Practical exercises have also been organized in Banteay Kdei from February 26 to March 21 for 10 students from the Faculties of Archaeology and Architecture. During this same mission, professional and practical exercises have been organized by Mr. Kosugi, from March 12 to 21, for 5 Cambodian stone-cutters.

Professor Ishizawa also recalled the technical training offered to 2 trainees at the National Heritage Institute of Nara, from October to December 1994.

In the name of the co-chairmanship, Mr. Kato thanked the various participants.

B) THE TRAINING ELEMENT IN THE IMPLEMENTED PROJECTS: THE 1% FOR THE TRAINING THAT MUST BE RESERVED IN ALL PROJECTS.

Mr. Dupavillon recalled that this decision had been unanimously adopted during the plenary session of the International Coordinating Committee that was held on December 2, 1994. He underlined the role of APSARA in the implementation of the decision.

He also wished that a summary of the various work-site schools be prepared so that proposals to strengthen their efficiency are made.

V - EDUCATION OF POPULATIONS

A) - INFORMATION ON ON-GOING PROJECTS

- Community participation project in protected zones

Mr. Hargreaves, United Nations Volunteers Programme Manager, after reminding the participants that this project had been approved during the October committee session, stated that it had been signed by the Royal Authorities on January 12 1995, and communicated to the United Nations Volunteers headquarters for final approval.

He underlined that, in order not to lose time, the recruiting procedure of volunteers taking part in the project had been implemented. Two international United Nations volunteers have been selected, 1 from Australia, and 1 from the Philippines, who will start work on April 15 1995. The third job of this international project would be filled in the following six months after the beginning of the project.

The first National United Nations Volunteer has already been selected and other jobs are actually being filled.

He also specified that at the same time, UNESCO was working on putting together the funding for a study from Parks Canada who will be mandated to define, for selected villages, the extent of degradations of the environment and identify practices of villagers which have a positive or a negative impact on the environment. The results from this study will serve as a basis for the work plan of the United Nations Volunteers environmentalists.

Mr. Beschouch underlined the importance of Parks Canada and thanked Canada for its support through the Parks Agency.

After **H. Exc. the Minister of State** stated his wish that APSARA be added on the list of agencies mandated for implementation, Mr. Beschouch indicated that it had already been taken into consideration.

B) - THE 1 % TO BE FORESEEN IN EACH OF THE PROJECTS TO ALLOW THE DEVELOPMENT OF THE POPULATIONS AND THE EQUIPPING OF THE PARK'S VILLAGES

Mr. Dupavillon recalled that the objective of this decision, voted unanimously by the ICC on 2 of December 1994, was to raise the interest of the population including religious communities, to protect and preserve the site and to associate it with economic development. Mr. Dupavillon underlined that it was indispensable to recognize the population in such ways as to better serve and fulfill its needs. He indicated that a survey would be conducted with this goal in mind.

VI - URBAN DEVELOPMENT AND TOURISM

INFORMATION ON ON-GOING PROJECTS

- Touristic Study funded by the French Development Bank

Mr. Fournier, manager of the project, reminded the participants of the main guidelines of this study on tourism development, funded by the FDB and implemented by LEISURE/SCORE/GIE NEW CITIES.

His priorities were all of the following :

- economic (indirect cash contribution and taxes from such a potentially major tourist attraction as Angkor-Siem Reap) ;
- cultural (archeological and ecological welfare of Angkor, including the Tonle Sap);

- social (balancing development as to avoid traumas, social and economical, and disfunctions that would put the Cambodian economy at risk) ;
- moral (success of such a development operation serving as a model associated to an archeological and cultural safeguarding action).

His strategic axes are as follows :

- to develop a high quality oriented tourism in Angkor-Siem Reap;
- to create conditions for the development of a real international patrimonial capital city, in coherence and harmony;
- to control the influx of tourism towards Siem Reap and control the influx of visitors to the Angkor Park;
- to make the cash returns of this touristic activity benefit the public and private sector;
- to create the necessary conditions for complete supervision by the Cambodian Government as far as development and touristic exploitation of Angkor is concerned;
- to give to a sole institution the mission to develop and manage Angkor.

Mr. Fournier underlined that a touristic influx of an amplitude of 1 million visitors (on an average three-day visit) had been retained as a work frame for year 2004 and it was realistic to take, in such a perspective, all necessary dispositions and precautions to ensure the safeguarding of the site.

Regarding this, 7 principles have been laid out:

- to prolong the average length of stay by offering a more complete and diversified range of poles of interest and relevant activities (touristic clientele more diversified with very different motivations and tastes);
- to forbid or limit as of now certain practices in such a way to control properly the influx of visitors to the park;
- to spread the visitors in time-wise zones;
- to spread the visitors on the whole surface of the Angkor-Siem Reap site (new logics added to the touristic circuit);
- to organize the creation of as many jobs as possible for the local and the Cambodian people;
- to propose diversified services corresponding to the potential customers of Angkor;
- to impose certain constraints to the privately-owned businesses in such a way to ensure a certain coherence to the touristic site of Siem Reap.

Mr. Fournier recalled that the different types of tourists are more and more diversified with different motivations, and thus greatly justified the creation of a Tourist information center which should be:

- a way to control the influx of visitors into the Park;
- a well marked place for the entry to the park site;
- an information both for a more complete and meaningful visit, and at the same time more respectful of the site grounds;
- a starting point for internal transportation;
- a center for interpretation and illustration of Angkor;
- an alternative site for leisure adding some value to the visit.

- Urban development of Siem Reap-Study funded by the French Development Bank

Mr. Pierre Clement, Manager of the Project, funded by the FDB and implemented by ARTE/BCEOM, reminded the participants that it was set up as an extension of the zoning plan and was taking into account the touristic development impact on urban planning.

Regarding this matter, a certain number of propositions have been submitted in such a way to:

- respect the quality of the site;
- give the most careful attention to protect the site;
- preserve the west of the city;
- develop the urbanization in the south-east sector to take into consideration the foreseen influx of population;
- plan the setting up of a hotel sector which should be located within the north-east of the city.

Mr. Clement pointed out that the project was entering a second phase and that the Royal Government's proposals were being expected.

His Excellency the Minister of State reminded the participants that the responsible organizations of these two projects had been selected following a bid in which many people participated.

He specified that the Royal Government was examining the different proposals which were submitted to him and the concept of the hotel city would probably be shortly launched so as to dispose of 3 hotels with 400 rooms in the next 2 years and a reception capacity of 800 rooms in the city. The Minister of State underlined the existing water problem for the hotel complex as well as for the city itself.

His Excellency Mr. Vann Molyvann underlined that the touristic development model of Bali had been taken into reference with the creation, next to the airport, of a new touristic city in such a way to protect the ancient city and avoid pollution, and sexual and speculative tourism.

His Excellency Mr. Son Soubert underlined the pressures brought about by the influx of people, pressures already existing in Angkor Wat. He insisted on the necessity to plan different access from the north-east or from the west rather than towards the south.

(Synthesis documents of the two projects funded by the French Development Bank which were distributed at the beginning of the conference to the participants, are not included in the minutes because of their volume. They can be consulted at the Permanent Secretariat Office of UNESCO).

- Identification of an infrastructure project and urban management for Siem Reap and Phnom Penh , funded by the World Bank.

His Excellency the Minister of State reminded the participants that the implementation of urban infrastructures was mandatory. He pointed out that it implied funding reimbursable on a long term basis attached with a low interest rate, for which the involvement of institutions such as the French Development Bank and the World Bank were necessary, private investors preferring operations with high returns and on a mid-term basis, such as funding of hotels.

The Minister of State said that the French Development Bank was helping the government in its search for funding and pointed out that the World Bank had expressed its interest in the infrastructure project and urban planning.

- Training guides and presentation of the site to the visitors

Mr. Beschaouch presented the main lines of the *training program* which will be conducted by the Ministry of Tourism with the support of UNESCO, thanks to the funds provided by AMEX, *for the training of 150 guides* of the Siem Reap region. This training, of a three-month duration, will comprise of the teaching of foreign languages and training in archeology, tourism, geography, history, culture, civilizations and arts, economy and politics, environment, law and travel in general (tourism and social insurance) and emergency.

Apart from theoretical training, this very complete program elaborated by the Ministry of Tourism, also includes internships of a two-week duration with travel agencies.

Given by Cambodian teachers, and a few international experts, this training, which will be implemented during the months of June, July and August 1995, will be the object of an evaluation report in October.

His Excellency Mr. Sam Promonea, Under-Secretary of Tourism, underlined the importance of this training program which should allow an up-grading of the guides' knowledge.

As it concerns *the presentation of the site to the visitors*, Mr. Beschouch recalled that the site of Angkor was an archeological site registered on the World Heritage List. He added that it was indicated that the facilities and touristic constructions and installations were implemented with a permanent link with experts. He mentioned, regarding this, the construction of small toilets in places such as in Preah Khan, at a site that presents problems from an archeological point of view.

H. Exc. the Minister of State evoked the example of the meeting at Chiang Mai, during which pictures had been presented to the organizers of the meeting.

The Representative from the Ministry of Tourism, **His Excellency Mr Sam Promonea** added that discussions had taken place with the construction of toilets with the Angkor Conservation Office and a French expert. He pointed out that H.Exc. Mr Michel Tranet of the Ministry of Culture and Fine Arts had estimated that they were not of too much encumbrance.

The Minister of State stated that all installations would have to be submitted to a construction permit and expressed the hope that the Planning Committee for Regional Development would be informed about the situation.

His Excellency Mr. Son Soubert underlined the necessity to respect the principle that any construction should have a special permission, and that archeologists had to inspect the location to determine if the site contains artifacts.

Mr. Kato, talking in the name of the co-chairmanship, underlined that great care should be given to this site registered on the World Heritage List.

Recommendation from the Technical Committee

The Technical Committee recalls that Angkor is a World Heritage site and that its presentation should respect certain rules, and recommends that the facilities and installations for the visitors should be done with the support of experts.

VII - REGIONAL DEVELOPMENT

- Information on the Integrated Development Plan in Angkor and within the Siem Reap region

Mr. Shinohara confirmed the commitment of the Japanese Government to the realization of the study of the Master Plan and also confirmed that JICA would send a mission to continue discussions with the Royal Government on the modalities of implementation of this study.

CONTRIBUTION PROPOSALS

- Information on the proposals presented during the 2nd of December meeting of the International Coordinating Committee

Mr. Beschaouch reminded the participants of the different propositions of contributions announced during the meeting of the committee.

Thus:

His Excellency the Ambassador of the German Federal Republic underlined that his government was offering the Royal Foundation for Angkor a funding for the restoration campaign of Preah Ko (2nd stage).

Mr. Beschaouch recalled that the technical file concerning work should be submitted to the Technical Committee.

His Excellency the Ambassador of India expressed the hope that his government finish the restoration work of the Angkor Wat Temple in conformity with the proposed project presented by the Archeological Survey of India. Mr. Beschaouch indicated that the technical file should be presented soon.

The Representative from the European Community Commission recalled the announcement made during the Tokyo Conference of the management of the Master Plan in cooperation with JICA and the French Development Bank, and mentioned that the Commission would wish to extend its support, especially in forest conservation and the training of trades related to tourism.

Mr. Beschaouch proposed that a letter be addressed to the Representative from the European Community Commission so that the Committee remains informed of these projects.

The Representative from the People's Republic of China expressed the interest shown by a team of specialists on the Silver Pagoda restoration project.

Mr. Beschaouch proposed that, in order to allow the Committee to examine, during its next meeting modalities to implement an international program concerning the Silver Pagoda, a letter should be addressed to Her Excellency the Ambassador of China, to be informed of the nature of the proposed contribution.

These proposals having been accepted, the Secretariat will soon submit these projects for the signatures of the two Co-chairmen.

VARIOUS MATTERS

- Renovation work at the National Museum of Phnom Penh

This question being impossible to be treated in the absence of the Representative from Australia and of Mr. Pich Keo, Director of the National Museum, the Technical Committee expressed the wish that a complete report be asked of the Director on the works done as well as the technical problems to be resolved. A letter will be addressed concerning this matter to His Excellency the Minister of Culture and Fine Arts.

Regarding the *ad Hoc experts commission* mandated to take care of the conservation, the restoration and the preservation of the National Museum collections, on which the Ministry of Culture and Fine Arts has officially agreed, a mission will be soon organized to study problems related to the restoration of works of art.

- The International Campaign

Mr. Dupavillon indicated that an information session would be organized on this matter during the next Technical Committee meeting.

- Date of the next Technical Committee Meeting

Regarding the importance of current projects on the site, it was decided to do as much as possible to hold the next Technical Committee meeting in Siem Reap.

The proposed dates are as follows:

- October 6th and 7th 1995 if the meeting takes place in Siem Reap, 6th of October being reserved for a visit of the site, and 7th for the meeting.
- October 6th if the meeting is held in Phnom Penh.

Mr. Shigenobu Kato, in the name of the co-chairmanship, thanked the Cambodian Delegation and all the participants of the third meeting of the Technical Committee for their cooperation and the richness of their contribution. He closed the meeting by congratulating the interpreters and the secretariat.

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ANNEXES

**COMITE INTERNATIONAL DE COORDINATION
SUR LA SAUVEGARDE ET ET LE DEVELOPPEMENT
DU SITE HISTORIQUE D'ANGKOR**

**INTERNATIONAL CO-ORDINATING COMMITTEE
ON THE SAFEGUARDING AND DEVELOPMENT
OF THE HISTORIC SITE OF ANGKOR**

**Troisième session du Comité technique
Third session of the Technical Committee**

Phnom Penh, 31 mars 1995
Phnom Penh, 31 March 1995

**Liste des Participants
List of Participants**

**REPUBLIQUE FEDERALE D'ALLEMAGNE
FEDERAL REPUBLIC OF GERMANY**

S. Exc. M. Wiprecht von Treskow

**Ambassadeur extraordinaire et plénipotentiaire
Ambassador Extraordinary and Plenipotentiary**

**BELGIQUE
BELGIUM**

M. Rudi Veestraeten

**Deuxième Secrétaire
Second Secretary**

**ROYAUME DU CAMBODGE
KINGDOM OF CAMBODIA**

S. Exc. M. Son Soubert

**Deuxième Vice-Président
de l'Assemblée Nationale
Second Vice-President of National Assembly**

M. Son Chhay

**Membre du Parlement, Secrétaire de la
Commission Culture et Education de
l'Assemblée Nationale
Member of Parliament, Secretary of the**

DELEGATION DU ROYAUME DU CAMBODGE

S. Exc. M. Vann Molyvann	Ministre d'Etat, Vice-Président du Conseil Supérieur de la Culture Nationale Chef de la Délégation Minister of State, Vice-President of the Superior Council of National Culture Head of Delegation
S. Exc. M. Chin Kimsreng	Sous-Secrétaire d'Etat aux Travaux Publics et aux Transports Under-Secretary for Public Works and Transport
S. Exc. M. Chhay Tân	Sous-Secrétaire d'Etat à l'Economie et aux Finances Under Secretary for Economy and Finance
S. Exc. M. Sam Promonea	Sous-Secrétaire d'Etat au Tourisme Under-Secretary of Tourism
M. Hem Yim Eng	Ministère des Travaux Publics et des Transports Ministry of Public Works and Transports
M. Sik Bun Hok	Directeur du Cabinet du Ministre de la Culture et des Beaux-Arts Director of the Cabinet of the Minister of Culture and Fine Arts
M. Mar Sophay	Directeur du Département du contrôle, Ministère de l'Environnement Director of the Department of control, Ministry of Environment
M. Ouk Sisovann	Secrétaire particulier du Ministre de l'Environnement Particular Secretary of the Minister of Environment
M. Meas Sambath	Sous-Chef de Département, Ministère du Plan Under-Chief of Department, Ministry of Plan
M. Seung Kong	Directeur du Cabinet du Ministre d'Etat Director of the Cabinet of the Minister of State
M. Tan Phong	Conseiller Counsellor
M. Ang Chouléan	Conseiller du Ministre d'Etat Adviser of the Minister of State
M. Ros Borath	Conseiller du Ministre d'Etat Adviser of the Minister of State

**CANADA
CANADA**

Ms Carolyn Cork

**Centre International de Recherche canadien
pour le Développement, Ambassade du Canada
International Development Research Centre**

**REPUBLIQUE POPULAIRE DE CHINE
PEOPLE'S REPUBLIC OF CHINA**

M. Xiao Zheng Rong

**Conseiller
Counsellor**

**REPUBLIQUE FRANCAISE
REPUBLIC OF FRANCE**

M. Gérard Porcell

**Conseiller de l'Ambassadeur pour les questions
de Coopération culturelle et technique
Counsellor of the Ambassador for Technical and
Cultural Affairs**

M. Christian Dupavillon

**Chargé de mission interministérielle
Official Interministerial Representative**

M. Alain Freynet

**Conseiller culturel
Cultural Counsellor**

M. Hubert Dognin

**Directeur, Caisse Française de Développement
Director, French Bank for Development**

M. François Lagier

**Caisse Française de Développement
French Bank for Development**

Commissaire Pierre Chassagne

**Délégué du SCTIP
SCTIP Delegate**

M. Jacques Dumarçay

**Architecte, Directeur de projet, EFEO
Architect, Director of Project, EFEO**

M. Bruno Bruguiet

EFEO

M. Jacques Gaucher

EFEO

M. Pierre Clement

**Architecte Urbaniste
Architect Urbanist**

M. Jacques Fournier

**Chef du projet Tourisme
Team leader of the Tourism Project**

M. Sébastien Cavalier

Chargé de mission

M. Jean-Michel Belhomme

**Ingénieur
Engineer**

M. Gérard Larose

**Conseiller géographe
Geographic Adviser**

M. Didier Moulin

Consultant

REPUBLIQUE DE HONGRIE

**INDE
INDIA**

S. Exc. Dr. Gauri Shankar Rajhans

**Ambassadeur extraordinaire et plénipotentiaire
Ambassador Extraordinary and Plenipotentiary**

M. N. K. Saxena

**Premier Secrétaire
First Secretary**

**REPUBLIQUE D'INDONESIE
REPUBLIC OF INDONESIA**

S. Exc. M. Taufik Rachman Soedarbo

**Ambassadeur extraordinaire et plénipotentiaire
Ambassador Extraordinary and Plenipotentiary**

M. Rusmaldi Dawanie

**Deuxième Secrétaire
Second Secretary**

**JAPON
JAPAN**

M. Shigenobu Kato

**Ministre-Conseiller
Minister-Counsellor**

M. Katsuhiko Shinohara

**Coordinateur régional
Première Division de l'Asie du Sud-Est
Ministère des Affaires Etrangères
Regional Co-ordinator
First Southeast Asia Division
Ministry of Foreign Affairs**

M. Takeshi Nakagawa

**Professeur, Université de Waseda
Directeur de la Mission gouvernementale pour la
sauvegarde d'Angkor
Professor, Waseda University
Director of the Governmental Mission for the
Safeguarding of Angkor**

Melle Michiko Kara

**Première Division des Affaires culturelles
Ministère des Affaires Etrangères
First Cultural Affairs Division
Ministry of Foreign Affairs**

M. Masaki Kawaguchi

**Troisième Secrétaire
Third Secretary**

M. Yuji Makabe

**Attaché
Attache**

M. Masahiko Tomoda

**Architecte
Architect**

M. Joji Kanda

**Ambassade du Japon
Embassy of Japan**

**REPUBLIQUE DEMOCRATIQUE POPULAIRE LAO
LAO PEOPLE'S DEMOCRATIC REPUBLIC**

M. Somphone Sichaleune

Deuxième Secrétaire

**REPUBLIQUE DE POLOGNE
REPUBLIC OF POLAND**

M. Grzegorz Przysiezny

**Conseiller
Counsellor**

**PHILIPPINES
PHILIPPINES**

M. Napoléon B. Domingo

**Responsable administratif
Administrative Officer**

**FEDERATION DE RUSSIE
RUSSIAN FEDERATION**

M. Guennadi Chevelev

**Conseiller
Counsellor**

M. Oleg Kharlachine

**Troisième Secrétaire
Third Secretary**

Mrs Tatiana Proskouriakova

**Fondation Angkor de la Russie
Angkor Foundation of Russia**

M. Long Seam

**Fondation Angkor de la Russie
Angkor Foundation of Russia**

**ROYAUME DE THAILANDE
KINGDOM OF THAILAND**

M. Prachote Sangkhanukit

**Directeur de la Division archéologique,
Département des Beaux-Arts
Director of Archaeology Division, Department of
Fine Arts**

Mrs Rewadee Skulpanich

**Chef de la Section légale, Département des
Beaux-Arts
Chief of Legal Section, Department of Fine Arts**

Mrs Penpan Jarernporn

**Chef du Bureau des Relations extérieures,
Département des Beaux-Arts
Chief of External Relation Office, Department of
Fine Arts**

M. Niran Boonjit

**Service des traités et des affaires légales
Department of Treaties and Legal Affairs**

M. Rusm Jalichandra

**Département de l'Information
Department of Information**

M. Cherdkiath Atthakor

**Deuxième Secrétaire
Second Secretary**

**ETATS-UNIS D'AMERIQUE
UNITED STATES OF AMERICA**

M. Frank Huffman

**Directeur de l'USIS
Director USIS**

**REPUBLIQUE SOCIALISTE DU VIET NAM
SOCIALIST REPUBLIC OF VIET NAM**

M. Doan Duy Thé

**Conseiller
Counsellor**

**COMMISSION DES COMMUNAUTES EUROPEENNES
COMMISSION OF THE EUROPEAN COMMUNITIES**

M. Patrick Trolliet

**Directeur du Bureau
Head of the Office**

**BANQUE ASIATIQUE DE DEVELOPPEMENT
THE ASIAN DEVELOPMENT BANK**

M. Malik Uroog

**Responsable principal des programmes
économiques
Senior Programme Economics**

**PNUD/VNU
UNDP/UNV**

M. Philippe Devaud

**Responsable de programme
Programme Officer**

M. Keith Hargreaves

**Responsable du Programme des VNU
UNV/Programme Manager**

M. Te Duong Tara

**Assistant de programme
Programme Assistant**

**SPAFA
SPAFA**

M. Pisit Chareonwongsa

**Spécialiste senior en archéologie
Senior Spécialiste in Archaeology**

M. Robert Groves

**UNESCO
UNESCO**

M. Khamliène Nhouyvanisvong

**Représentant personnel du Directeur général
au Cambodge
Personal Representative of the Director-General**

M. Etienne Clément

**Section des Normes internationales
International Standard Section**

M. John Willson Donaldson

**Division des normes internationales
International Standard Division**

Mme Emiko Murai

**Spécialiste de programme
Programme Specialist**

Melle Kuniko Mori

**Spécialiste Culture
Culture Programme Officer**

**SECRETARIAT DU COMITE
SECRETARIAT OF THE COMMITTEE**

M. Azedine Beschouch

**Représentant spécial du Directeur général
pour Angkor
Special Representative of the Director-General
for Angkor**

Mme Monique-Edwin Massoni

**Secrétaire du Comité
Secretary of the Committee**

LISTE PROVISOIRE DES OBSERVATEURS

TENTATIVE LIST OF OBSERVERS

COFRAS Déminage

Colonel Billault

**Chef du Détachement
Brigade Chief**

**INSTITUTE OF ASIAN CULTURES
SOPHIA UNIVERSITY**

M. Yoshiaki Ishizawa

**Professeur, Chef de la Mission
Professor, Team Leader of the Mission**

M. Masao Katagiri

**Architecte
Architect**

IUCN (International Union for the Conservation of Nature and Natural Resources)

M. David Ashwell

**Représentant au Cambodge
Representative in Cambodia**

LIGUE FRANCAISE DE L'ENSEIGNEMENT

M. Charles Maisonnave-Coutérou

**Chargé de Mission
Chargé de Mission**

ROYAL ANGKOR FONDATION

M. Janos Jelen

**Directeur du Conseil d'Administration
Chairman of the Board of Trustees**

Dr Elisabeth Moore

**Archéologue
Archaeologist**

WORLD MONUMENTS FUND

M. John Stubbs

**Directeur de Programme
Programme Director**

Prehistory Project
Dr. Elizabeth Moore
SOAS, University of London
Royal Angkor Foundation (Budapest) [RAF]

The Prehistory Project of Dr. Elizabeth Moore, was begun with ground truthing in December 1994. Mounded sites were checked against the following images: 1945 Williams-Hunt Collection, 1954 French Indochine cover, 1992 Finnish cover supplied to the UNESCO ZEMP, and SPOT panchromatic and colour (courtesy C.Jacques, EPHE). The research was made possible by funding from the School of Oriental and African Studies (SOAS), University of London, and the Royal Angkor Foundation (Budapest) [RAF].

Three aspects of the Prehistory Project are planned for 1995, subject to approval from the ICC. These are:

1. Site distribution, location and morphology: Use of the NASA SIR-C/X-SAR radar and other forms of remote sensing for continued study of the overall distribution, location, mound height and contours, of 68 prehistoric mounds in the Angkor region, previously divided into the Lovea (Puok), Siem Reap, and Roluos groups.
2. Comparative hydrological analysis: Using a combination of remote sensing and ground survey, comparison of the differing existence and/or survival of earthworks and moats of mounded sites along the ancient river course of the Puok valley, the old Stung Siem Reap, and the Roluos River. Promising sites include Phum Reul, Phum Trei Nhor, Phum Romiet, Phum Lovea, Phum Khlát, Phum Bam Penh Reach, Phum O Spean Dek, and Phum Stung.
3. Prehistoric-historic interface at Hariharālaya: Using a combination of remote sensing and ground survey, detailed study of the relationship of Phum Stung to the Indratataka, and the postulated existence of a settlement in this area prior to the founding of 'Hariharālaya' in the 9th century AD. The purpose of this aspect is to understand the adaptational, particularly hydrological, shifts that accompanied the moment of change when temple building commenced.

The historic component of the programme would begin with the survey and mapping of the 400 x 500 metre enclosure of Preah Ko, to document both historical structures and earlier, possibly prehistoric, cultural layers. Further expansion would take in relating prehistoric mounds, temple and water features found to the east and west of Preah Ko, and north-to-south from the Indratataka *baray* in the north to the site of Trapeang Phong in the south. Prei Monti presents useful comparative material in the positioning of the temple and the terrain of its moated enclosure.

The temple of Preah Ko is of particular interest in an investigation of the prehistoric-historic interface for its proximity to the Indratataka and Phum Stung, the excellent preservation of its moat, its ancestral dedication, and as a starting point for investigating locational preferences of the prehistoric period which were later 'marked' with temple structures. Within the historic period, it presents an urban zone of relatively short occupation, and in that sense a prototype for the intense and longer chronological layering of features at Angkor. This is particularly the case in the relationship of rivers, dikes, and canals to tanks, *barays* and temple features.

NASA/RAF/WMF Radar Imaging Research Project

*National Aeronautics and Space Administration (Pasadena) [NASA]
Royal Angkor Foundation (Budapest) [RAF]
World Monuments Fund (New York) [WMF]*

Background

On 30 September 1994, with the permission of the government of Cambodia, an image of Angkor was acquired by the NASA SIR-C/X-SAR [Spaceborne Imaging Radar-C/X-Band Synthetic Aperture Radar], as part of NASA's Mission to Planet Earth. The radars illuminate the earth with microwaves in three wavelengths which may be transmitted and received using both horizontal and vertical polarizations. In addition, the new technology of interferometry allows three-dimensional images to be processed, generating digital elevation computer models. The goal of the NASA project is to give scientists clearer insights into those environmental changes which are caused by nature and those changes which are induced by human activity.

Potential of radar imagery at Angkor

At Angkor, the landscape was profoundly changed by human activity between the 9th and 13th century AD. The intense activity of these six hundred years, however, was preceded by a long period of human occupation. During both the prehistoric and historic eras on the Angkor Plain, water was the most critical natural resource. Water was fundamental in ritual, urban, and agricultural alteration, and in achieving a harmonious balance of natural and manmade elements at Angkor.

The NASA radar is ideal for investigating cycles of hydrological use and change at Angkor. The microwaves not only measure the reflectivity of water, but record a "double bounce" effect when they deflect from a horizontal body of water (such as a *baray*) to a vertical feature (such as trees). This is just one example of the potential methods for manipulating the NASA radar data to understand, and preserve, the waters of Angkor.

RAF & WMF cooperation on NASA project

The ongoing projects of the RAF and the WMF at Preah Ko and Prah Khan offer an ideal comparison for initial use of the NASA radar at Angkor.

1. *Baray*. They represent the first and last known great *baray* at Angkor: the Indratataka and the Northern *Baray*.
2. **Urban areas and rivers**. The two sites contain the first and last urban precincts to be built during the height of the Angkorean empire.

The city of Hariharālaya and that of Prah Khan have been little studied but in both cases a populated zone is clearly defined on the NASA image. At Hariharālaya, this extends south to Trapeang Phong, east to the Roluos River, and west to the canal of O Spean Dek. At Prah Khan, the NASA image reveals a gridded area reaching far north from the temple site into the critical area of the course of the ancient Stung Siem Reap.

Thus study of the urban areas links fundamentally with the two main river systems exploited at Angkor: the Stung Rolous and Stung Siem Reap.

3. Ritual, kingship, and transformation of the terrain. Preah Ko and Prah Khan also present an ideal ritual and royal comparison.

Although ancestral dedication is key to both sites, one is Saivite and the other Mahayana Buddhist. Both may have sheltered monastic communities. Hariharālaya was the first city of the *devarajas*, with Preah Ko the final resting place of Jayavarman II. Prah Khan the creation of the last great ruler of Angkor, Jayavarman VII, and like Preah Ko dedicated to his ancestors.

Yet to be assessed, however, are the cycles of change that took place. If Preah Ko marks 'beginnings', and Prah Khan 'endings', how did Khmer methods of water management and land transformation evolve during this time.

The NASA radar's tremendous volume of data, and the many ways it can be processed, offers a means of comparing these two sites, not only visually, but statistically and conceptually.

Project intentions and Access

An overview of the data that NASA has provided to the WMF/RAF consortium to date, and possibilities for its use is described in the accompanying volume entitled, *Radar Imaging of the Angkor Eco-Site, Report of the First Scientific Roundtable*, Princeton, New Jersey, February 1-2, 1995. Reference is made especially to Chapter 3: Future Plans and Directions.

WMF/RAF Radar Imaging Research Project is specifically designed to serve as 'pilot' or 'demonstration' project and is open to participation by all other researchers working at Angkor who may be able to benefit from the new investigative method.

The WMF/RAF collaborative is anxious to install the NASA/JPL radar imaging data in the country and made publicly accessible as soon as the appropriate computer hardware systems are in place, at an appropriate research facility in Cambodia (such as the Conservation d'Angkor or at APSARA).

Preah Ko Project
Royal Angkor Foundation (Budapest) [RAF]

The Royal Angkor Foundation completed its second season at Preah Ko at the end of March 1995 funded by the Federal Republic of Germany. During both seasons, training of Khmer counterparts was conducted. This focused on techniques relating to the brick, stucco and stone components of Preah Ko. For example, in the 1993-94 season this included lectures and practical work on stone types, quarrying and carving, and conservation. In 1994-95 training topics included preparation of mortars, re-jointing of old detached brickwork, insertion of bricks and micro-pointing.

1994-95

The second phase of the Preah Ko Project principally involved the structural consolidation of the towers. This involved many of the stone elements. However, attention was also given to protection of stuccoes during the structural interventions, and work continued on the brick, notably removal of the cement and brick which had been applied to the base of the *dvarapalas*. Finally, an archaeological component was added to the project.

Stone treatment

The stone consultant for the project: a) consolidated stone elements which will be used in the structural consolidation of the towers; b) consolidated broken sculptural elements; and c) tested products to be used in later phases.

Damaged stone blocks on the base plinths of the western row of towers were examined and, where necessary, removed. This is the first step in the effective protection of the base of the towers from further water infiltration which has proved to be a principal cause of decay.

In the course of this operation a study was made of the original levels of the platform, both centre and edges. This is an essential beginning to control of the run-off and evacuation of water from the platform.

The consolidation of the stone plinths and foundations, and control of water infiltration and run-off, are key to the effective conservation of the towers at Preah Ko.

Stone to be repaired was first washed. For this the following materials were tried: de-ionised water, ammonium carbonate, ammonium carbonate (30%) with EDTA (25%), trielene, acetic acid at 5%, plus low pressure micro-sanding. The stone was then: 1. treated with 2 % Neo-Desogen; 2. weak or incoherent surfaces were treated with Paraloid B72 at 5% in paint thinner in order to strengthen the surface and the subsequently bonding; 3. bonded with Araldite epoxy resin HY 554 with micronised silica as a thixotropic agent; 4. stainless steel or fibreglass dowels were inserted to further strengthen the bond, in a manner to be invisible when the operation is completed.

In cases where bonding was involved, the same techniques were applied to repairing stones and carvings. New techniques were tried for the pointing of cracks and micro-cracks, with stone dust, ethyl silicate and micronised silica. Previously stone dust and lime had been used.

The removal of the base blocks also facilitated the digging of a trench between the tree west of the Central West tower. The tree root was fully exposed, and treated with imazapyr. The step and door jambs of the Central West [CW] tower, west facade, was consolidated and repositioned. It is planned to remove and consolidate the door lintel.

Scaffolding was erected on the CE and CW towers. Temporary shoring applied to the west doorway of the CW tower, west door and southwest corner, and to a total of 9 pilasters.

Stucco treatment

Fragile areas were protected, which might otherwise be harmed during structural intervention of the towers. Additionally, a protection system is being studied and developed. Where possible, stucco fragments found on-site were repositioned on the towers. Areas, such as the CE and CW tower, where cohesion was lacking, were consolidated by impregnating with ethylsilicate. Work was completed on the north doorway of the Central West tower with positive results, and an important fragment was re-adhered to the west pilaster, north facade, of the North West tower.

Brick treatment

Plant eradication continued, along with filling of small spaces in the brickwork. Limited pointing and micro-pointing was carried out, and bricks lacking cohesion were tested for consolidation. Brick and cement which had previously been applied at the base of stone *dvarapalas* was removed and replaced with new brickwork. Cleaning of bricks was concluded successfully with no damage to the underlying material through meticulous use of precision apparatus.

Site aesthetics

Tourist routes and signs were erected. Landscape work was carried out by the ILO on vegetation in and around the precincts, revealing the ground plan with greater clarity. The third phase of the project will incorporate further aspects of the aesthetics of the site, and a full scale maintenance plan to follow completion of the conservation work.

Documentation

Documentation of the monument by J. Vajda includes a complete set of photogrammetrically rendered elevations, plans and sections, the first ever prepared for Preah Ko. For the stone work, working drawings have been prepared of each individual carved stone element, which will result in some 200-250 finished drawings. A 2nd phase final report on the stone work is being prepared along with graphic documentation.

Archaeology

Surface survey was carried out within the moated area of Preah Ko by E. Moore, who also began initial investigations of the 'Hariharālaya city precinct' to the east and west

of the Preah Ko site. The work is a methodological and geographical expansion of the Preah Ko project. Documentation includes: 1. *Preah Ko and the city of Hariharâlaya*, to be published by Silpakorn University, Bangkok, in a publication to honour the 72nd birthday of H.S.H. Prince Subhadradis Diskul; 2. 1:10,000 scale map of 'Hariharâlaya' drawn from enlarged 1992 aerial cover; 3. Image archive, under direction of B. Márkus: a) aerial photographs: 1945 Williams-Hunt Collection; 1954 French Indochine; 1992 Finnish cover; b) 1992 SPOT colour and panchromatic images; 1994 NASA SIR/C-X-SAR radar image.

1993-94

Emergency intervention

Emergency consolidation of stucco and stone elements was carried out on all 6 towers, as well as surface treatment of brickwork. It was vital to stabilize the stucco before strengthening the brick towers. Had repairs to the towers been attempted first, the stuccoes would have fallen.

Clearing of tower superstructures saw debris removed and large amount of vegetation destroyed, halting further root-induced damage to the upper towers.

Study and testing was begun of not only surface consolidants but also on a total of 240 samples of stucco, stone, and brick: to understand their composition, invasive elements, and potential interaction with the range of tested surface consolidants.

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The temple of Préah Kô and the city of Hariharâlaya

"...confronted again with the mind of man, making ever new sense of the world by dwelling in its particulars with a view to their comprehension." Polyani (1966:56)

Introduction

In 802 AD, with the consecration of Jayavarman II as *Devarâja*, a 'new sense of the world' was inaugurated on the Angkor Plain. In the ceremony on Mahendraparvata (Phnom Kulên) he was crowned both *cakravartin*, 'universal emperor', and *Devarâja*, 'god who is king', thus becoming supreme ruler in both the universe of men and that of the gods.¹ He does not appear to have founded a royal city on the mountain. It was on the floodplain, at Hariharâlaya, that the power of the new doctrine was to be demonstrated in the first city of the *Devarâja*.²

Hariharâlaya, twelve kilometres southeast of Angkor, was the main centre of Khmer kingship for only a short time.³ Early in the reign of Yasovarman I (889-910 AD), power shifted to Angkor. There it remained for several hundred years, leaving a concentrated zone of temples, reservoirs, moats, and dikes. In contrast, Hariharâlaya preserves the first, perhaps simpler, urban efforts of *Devarâja* rule.

Simple or complex, the mechanisms of urbanization remained consistently angular, and dominated by water: temples surrounded by rectangular moats; *barays* forming east-to-west blocks; linear dikes and moats linking the various sites. Water was essential, for it was the paramount expression of the spiritual, ancestral patrimony of the land. This all-embracing honouring was complemented by dedication of temple shrines to specific forebearers, described through the medium of Hindu iconography. The essence of the

¹ Jacques 1992:3,4

² Although the laterite pyramid of Rong Cen (Krus Prai Aram Rong) may have been the centre of Mahendraparvata (Boulbet & Dagens 1972:42, Jacques 1992:5), this and other structures are markers of sacred mountain places rather than a urban precinct.

It is not clear how long Jayavarman II remained on Phnom Kulên, although both he and his successor Jayavarman III (854-877 AD) are thought to have died there. It is not until the reign of Indravarman (877-889 AD) that dated constructions are known: the Indratatâka (877 AD), Préah Kô (879 AD), and Bakong (881 AD).

³ Hariharâlaya appears to be the only city name of the Khmer formed with the suffix *-âlaya*, meaning 'residence' or 'house'. It is seen in Thailand as *Mahâvidyâlaya*, 'university'. The more usual designations for a city are *pura*, or else *nagara*. Hariharâlaya therefore may suggest it was originally more the name of a temple than that of a city. (C. Jacques, personal communication, 1995)

Devarāja lay in the power to control and harmonize the living presence of known ancestors with the collective ancestral forces of land and water. These two aspects can be seen in the use of water, the dedication of temples and the overall urban design of Hariharālaya.

The three main temples of Hariharālaya are aligned north-to-south below the Indratatāka: Préah Kô, Bakong, and Prei Monti.⁴ The arrangement is not replicated elsewhere, although this conclusion may be altered with the detection of as yet unknown city layouts, or conceptually disassembling the intricate chronology of Angkor.⁵ The Indratatāka *baray*, source of sacred waters and ancestral spirits, forms a barrage to collect and control the waters of the Rolûos and other streams to the north. It shelters Préah Kô with its six towers dedicated to male and female ancestors, an intimate chapel of the king. Behind Préah Kô lies what may have been the royal habitation area. This design is mirrored in the seemingly earlier enclosure of Prei Monti to the south. Between Préah Kô and Prei Monti lies Bakong.⁶ Of these temples, that of Préah Kô is of particular interest as its dedications define its fundamentally important role at Hariharālaya, that of ancestral veneration.

The temple of Préah Kô

The name "Préah Kô", or 'sacred cow' refers to the three statues of Shiva's bull *Nandin* which are facing the east facade of the temple platform at courtyard level. In the Préah Kô inscriptions, the honorific names of the ancestors to whom they were dedicated, were given, but not the name of the temple. The first appearance of *Nandin* as a sculpture in the round is said to be at Préah Kô.⁷ However, many other temples of this period, such

⁴ The map of Hariharālaya also shows several prehistoric mounds in the region. The prehistoric-historic interface, while outside the scope of the present paper, is also part of the author's research on the area.

⁵ This is one application being developed by the author in conjunction with the NASA/RAF/WMF SIR-C/X-SAR Project - the National Aeronautics and Space Administration (Pasadena) [NASA], Royal Angkor Foundation (Budapest) [RAF], and World Monuments Fund (New York) [WMF], [Spaceborne Imaging Radar-C/X-Band Synthetic Aperture Radar], part of NASA's Mission to Planet Earth.

⁶ It is difficult to label it the 'first' temple mountain, given the existence of Ak Yum, and perhaps others terraced pyramids. However, its stone construction is unique, as are the brick towers which encircle the base of Bakong. Unlike the specifically inscribed temples of Préah Kô, the overall dedicatory sense of Bakong's brick towers remains uncertain. The similarities are strong enough, however, to conclude a similar pattern of ancestral dedication.

⁷ Briggs 1951:101. Their legs are folded under, and they are shown with a neck which is "short and stout, and a well-developed hump. (Coral 1933:114-5) The name Prei Monti ("la forêt du palais") also appears to be recent, derived from local legend. (Jacques 1988:44)

as Bakong, also have statues of *Nandin*. Publications earlier this century refer to the temple as 'Bàkô' or 'Bakou', having the same meaning but a different transcription of the Khmer script.⁸

The temple of Préah Kô consists of six brick towers or *prasats* situated on a platform which is somewhat longer north-to-south than east-to-west (30 x 24 metres).⁹ The towers are arranged in two rows of three towers each, with those on the east larger than those on the west.¹⁰ The towers of the east row, from north-to-south are dedicated under vocables of Shiva to: Rudravarman, Indravarman I's maternal grandfather (Rudresvara); Jayavarman II (Paramesvara); and Prithivindravarman, the father of Indravarman I (Prithivindresvara). The north-to-south towers of the west row are dedicated under vocables of Gauri, wife of Shiva to: the wife of Rudravarman (Narendradevi); the wife of Jayavarman II (Dharanindradevi); and the wife of Prithivindravarman (Prithivindradevi).¹¹

The platform upon which the towers sit is 1.5 metres from ground level, faced with sandstone around a brick and mud-based mortar fill. The present paving on the platform averages about fifteen centimetres in thickness.¹² Although opinions on brick construction methods vary, it is thought that the tight fit of the bricks was achieved by soaking them in water, and then rubbing them together, perhaps with lime putty. A lime-based mortar was used to bind the brickwork of the tower foundations.¹³

The brickwork of Préah Kô has been compared to that of Cham brick sanctuaries of the same period. As in Cambodia, various descriptions have been given:

"Recently, Tran Ky Phuong of the Cham Museum Da Nang has identified the resin of the plant *Dipterocarpus alatus Roxb.* as a possible substitute for mortar. (1988:19) This resin, when mixed with powdered

⁸ Barth & Bergaigne 1885:117, following Aymonier (*Journal Asiatique*, 1883). Doudart de Lagrée called it Preakon (Prea Kou).

⁹ Pichard 1994

¹⁰ Briggs 1951:101 after Parmentier (1919) and Marchal (1937)

¹¹ Little work has been done on the relationship of lintel iconography to the main dedication of each shrine. It is notable, however, that here, and elsewhere, while the inscriptions dedicate the foundation to Shiva, many lintels bear motifs associated with Vishnu, often Garuda. (V. Degroot, personal communication, 1995)

¹² Lujan & Prantera 1994:item17

¹³ Lujan & Prantera 1994:items18,21

mollusc shell is still used today as a waterproof sealant of fishing vessels and with the addition of crushed brick forms a powerful adhesive."¹⁴

The central east tower [CE] is set back somewhat from the northeast [NE] and southeast [SE] ones. The other irregularity in the arrangement of the towers on the platform is seen in the rear, west, row. The northwest tower is placed slightly south of the northeast tower, so that the moonstone on its south side touches that of the central west tower's north side. No satisfactory explanation has been put forth for the unusual positioning of either the central east or northwest towers. ¹⁵

The towers are square in plan, opening to the east, with false doors on the other three facades. Each *prasat* rests on a sandstone base. Sandstone was also used for moonstones, stairs, doorjambs, colonettes, lintels, and guardians inserted in interpilaster spaces. ¹⁶ Laterite was not used on the towers, although it is found in the second and third *gopuras* and walls. Brick was used for the main body and superstructure, which has four diminishing upper levels, with false doors and guardians are carved into the brick in the same manner as the larger doors below. The brick areas were covered with stucco, and may have been painted. ¹⁷

¹⁴ Southworth 1995

¹⁵ Glaize (1963:25) finds "no apparent reason" for the unusual placement of the northwest tower. Parmentier mentions that the east row forms "très heureusement un retrait au milieu" (1960:225). Elsewhere, Parmentier suggests that the construction of Bakong preceded that of Préah Kô, but that the greater size of Bakong delayed completion, accounting for its dedication after Préah Kô. (1919:1-98).

Stern hypothesized that the royal temples of Jayavarman II and Jayavarman III were located in the centre of Préah Kô and that Indravarman built the brick towers around it (1938:175-97). No proof has yet been found for this theory, although the present arrangement of buildings could have been determined by other structures, either present at the time, or knowledge of their past placement.

Another possibility, not for the remaining six towers, but in relation to Stern's idea, is that buildings in the site's third enclosure pre-date Préah Kô. This is discussed further in the text in relation to the positioning of the temple platform along the outer moat.

¹⁶ Sandstone is also seen on some portions of the tower, probably to strengthen the structure. For example, sandstone is found on the southwest corner of the first register of the central east tower. It may have offered a "broader surface for the overhanging cornices thus providing reinforcement and increasing the stability of the small bricks employed which could never have permitted such an overhang. It is also possible that some of the stone slabs that now make the pavement of the platform originate from the collapsed cornices that were built in this way." (Lujan & Prantera 1994:item 23)

¹⁷ The stucco was applied in several layers, beginning with a coarse mixture, and ending with a thin wash. In some areas, such as continuous cornices, sandstone reverse moulds may have been used to impress the design.

Inside, the temples are square single cells, the largest being that of the central east tower.¹⁸ No statues remain inside the cells today, although Marchal notes two.¹⁹ It is unclear, however, whether statues served as the central icon, or whether all of these were Shiva *lingams*. Trouvé, at the advice of Coèdes, reassembled the Shiva *lingam* and *yoni* bases at Préah Kô, to point north.²⁰ These are still found in several of the towers.

The present stone floor is below ground level but it is not thought that the stone was covered by a wooden floor to bring it to ground level. On the east row of towers sandstone foundation blocks have been found below the level of the platform, and the platform appears to have been constructed so as to leave space for the "wells beneath the altars and the lowered floor levels of the towers".²¹ Wooden beams are thought to have been used to strengthen the inner wall above the entrance.²² Wood would also have been used for the ceiling, laid above the projecting cornice. The areas above the cornice were left rough, whereas the walls up to the cornice were coated with a rendering, normally red.²³

The temple enclosures

First enceinte

The temple platform has three staircases on the east, one in front of each tower, but only one to the west, aligned precisely with the central west tower. The side blocks of the staircases are carved with guardian figures, with a freestanding lion seated on top.²⁴

Traces of red paint have been found on this wall, and also on some portions of the mortar. It is possible that the temples were painted red, but directly on the brick, and that all the stuccoes were applied at a later date. In some respects the stuccoes are similar to later stone carvings, for example on the central tower of Phnom Bakheng (late 9th - early 10th century), and at Banteay Srei (967 AD). (Lujan & Prantera 1994: items 29-32)

¹⁸ Glaize cites it as being 3.7 metres square, with the north and south eastern towers having cells 3.4 metres square. Those in the west row are only 2.5 metres square. (1963:258)

¹⁹ Marchal 1961:224

²⁰ "Selon les instructions de Mr. Coèdes, nous avons ramené les piédestaux à snânadronî qui se trouvaient dans les tours Sud-Ouest et Nord-Ouest, de façon à leur donner l'orientation rituelle." (Trouvé 1932: August 1937)

²¹ Lujan & Prantera 1994: item 18

²² Briggs (1951:99), citing Parmentier (1919, 1936)

²³ Lujan & Prantera 1994: item 29

²⁴ Only those on the east were put back into place during the work of Trouvé, although the pieces of the lions which once guarded the west stair have been gathered together at its base.

The platform is enclosed by three concentric enclosures. The wall and east and west *gopura* of the innermost (first) enclosure is constructed of brick. As with the platform, it is slightly rectangular (56 x 58 metres).²⁵ When the innermost *gopura* and wall were in place, little would have been seen of the six towers.

The inner *gopura* is one of the finest pieces of brickwork in the temple complex. A structural fracture on the outer south wall does not follow the joins in the brickwork - usually the weakest point and the line of breakage - but cuts straight through the brick. Similar fractures have been noted on Cham sanctuaries, including My Son A1, where subsequent analysis offers an interesting parallel to Préah Kô.

"Moreover, inside the crack, the different layers of brick are so tightly laid as to appear fused together. In 1982, an analysis of the fabric of Cham bricks was undertaken in Poland by the Lublin section of the state Workshop for the Restoration of Historical Monuments (PKZ). Ten brick samples were chosen from different sections of temple D5 at My Son, dated by Phillippe Stern to about the 11th to 12th century AD. They concluded that the bricks and sealing agent were both composed from the same natural clay; that the bricks had been initially baked at a temperature of between 540 C to 1000 C; and that the bricks had been bonded together by clay subsequently fired to a temperature of over 540 C."²⁶

The absence of any building foundations in the first enclosure is notable, but very much in keeping with the impression that access was very restricted to this inner cloistered area of Préah Kô. Given the use of brick, the square plan of the east and west *gopura* - versus the laterite and sandstone and cruciform plan for the second and third *gopuras* - this inner area may slightly predate the outer enclosures.²⁷

Second enceinte

The variety of public buildings in the second enclosure contrasts the privacy and absence of structures in the first *enceinte*. Also, rather than brick, the second enclosing

²⁵ Glaize (1963:257), whereas Briggs (1951:101) measures the first enclosure at 60 metres square.

²⁶ Southworth 1995, citing Stern (1942:87) and Skibinski (1985:44-5).

²⁷ This suggestion could support that cited above, that the stuccoes of the towers post-date their construction by a number of years. The foundation stele of the temple was found in the first *gopura*, dated to 879AD and dedicating three images of Shiva and of Devi. However, the other side of the stele dates to 893AD, being a dedication of Yasovarman I to the deities in the central east and south east towers. A much later inscribed stele dates to 1005AD, being the eulogy of Jayaviravarman (1002-1011AD), whose throne was usurped by Suryavarman I (1002-1050AD). (Glaize 1963:255-6)

wall is constructed of laterite, and the *gopura* of laterite and sandstone. The wall, like the temple platform and the first enclosure, is only slightly rectangular (94 x 97 metres). As with the first enclosure the longer axis is east-to-west.²⁸ A laterite walkway connects the second and first *gopuras*. The second *gopura* is cruciform in plan, with seven-baluster windows to the east. The wall is topped with a triangular cap, and buttressed by a laterite platform which flanks the entire perimeter of the second *enceinte*.²⁹

There are remains of eleven buildings in the second enclosure. All but two (foundations of a platform in the southwest sector, and another in the southwest corner) are succinctly described by Glaize:

"The court around the second enclosure once contained, in the larger eastern part and running parallel to the side walls, two symmetrical long rooms with pillared doors facing one another, and then two others perpendicular and opening to the east to a small path running north south. Two buildings forming galleries, entirely ruined, are once again aligned east west against the north and the south enclosure walls, each with a door to its main facade. Finally, a square brick building with a reduced upper storey, in every way comparable to those at the Bakong, remains standing between the two long rooms to the south thanks to the considerable thickness of the walls: opening to the west by a door, it is vented by lines of holes and decorated above with figures of ascetics carved into the brickwork, while below a series of niches shelter other figures moulded in stucco. The western side, the courtyard, quite cramped, was occupied by two long north-south galleries, symmetrical around the main axis of the monument which is marked by a partly demolished *gopura*." ³⁰

Third *enceinte*

Just as the second *enceinte* presents a different aspect than the first, the third enclosure changes again. Although the function of the buildings in the second enclosure remains unclear, the mapping of foundations in the third has yet to be undertaken. The area of the third enclosure once more forms a rectangle, measuring some 600 x 550 metres,

²⁸ Briggs (1951:101) records both first and second enclosures as square, at 60 and 90 metres, respectively.

²⁹ The wall is well over a metre in both width and height, being particularly well preserved on the north and east sides, areas at present thickly vegetated. Glaize mentions this, but only in reference to a small terrace being present leading up to the second *gopura* (1963:256 trans.N.Tremmer)

³⁰ (1963:256, translated by Nils Tremmer)

with the longer axis north-south.³¹ This is formed by a moat, fifty metres wide, around all parts of the enclosed rectangle except the temple platform.

A laterite walkway connects the second and third *gopuras*. The presence of a number of large square stone pillars suggests it may have been tiled, and possibly also lined with small lotus-shaped boundary pillars. The walkway is flanked by two parallel galleries, now foundations only. It is in this outer court also - not in line with the *gopura* - that the two ends of the site's moat terminate. The moat is not continuous, stopping just outside - on the north and south - of the wall of the second enclosure. There is some evidence from ground survey and aerial and satellite images that an earthen causeway may once have existed on the western side of the site as well. Except for some portions along the west side, the moat is in excellent condition. Not only is it well filled with water, but its angular form has been well preserved. This is interesting, as there is no surface evidence for a wall on either the inside or outside. There are, however, earthen banks, which may contain laterite blocks, or may simply have supported a wooden palisade.³²

This outermost *gopura* is similar in plan to the second, although with additional chambers on its north-south wings. It is thought to have been tiled, and finds of large carved sandstone volutes suggest it ended in elaborate triangular frontons.³³ Like the second *gopura*, baluster windows are present only on the exterior side, although here the balusters number five rather than seven. Another similarity is a finely carved moonstone on the threshold. Today, this moonstone is right on the north-south road connecting the south bank of the Indratatāka to Bakong. Examination on the ground and on aerial photographs suggests the road has been widened in recent years. Nonetheless the placement of the temple so close to the road is seldom seen.

Further, there is an east-west track extending from this outer *gopura*. The track is clear for a distance of about half a kilometre before disappearing in the vegetation. Some 200 metres east of the temple, a square basin can be seen. The basin is somewhat unusual -

³¹ This measurement was taken off 1:50,000 map cover and 1:40,000 aerial photographs. Glaize gives the enclosure a size of 500 x 400 metres with the longer axis east-west. (1963:255) Parmentier records the dimensions as 800 x 450 metres (1960:225).

³² Outside of the moat a further 'band' is visible on aerial photographs. Measuring some 100 metres in wide, it mirrors the angles of the moat. It is unclear if the outer rim of this was demarcated in some manner to associate it with the temple. A similar perimeter band is seen outside the outer moat of Bakong.

³³ Glaize 1963:256, translated by Nils Tremmer

square, about 100 metres each side, it is surrounded by a laterite wall and appears to have had steps leading down to the water. Further east and south is are several brick towers enclosed by a moat, the remains of the temple of Srah Nge.³⁴

The presence of this eastern zone of building raises further questions as to the original limits and structures of Préah Kô. These also relate to the as-yet uncharted remains in the vast western area enclosed by the Préah Kô moat. For example, immediately west of the temple platform a large raised area may be seen. Now heavily overgrown, and still occupying only a small portion of the immense moated area, the north-south axis of what may be a palace platform is apparent both on the ground and on aerial and satellite images. There is today a path leading west, along the north side of the temple platform, back to the 'palace platform'. Its presence may explain why the placement of the temple platform is not at the midpoint of the moat.³⁵

It is possible that the moat post-dates the temple platform, or that the offset was prompted by pre-existing elements within the moated area. Preliminary ground survey in 1994 showed that the larger, northern sector of the Préah Kô moated area is lower than the southern portion and appears to contain fewer foundations. The same topographic pattern is present at Prei Monti to the south of Préah Kô. At Prei Monti, the break in the moat is offset with the larger portion to the south. Like Préah Kô, preliminary ground survey at Prei Monti suggested the larger sector contained lower ground and upland gardens. Notable also is the close alignment of the north-south eastern moat of both Préah Kô and Prei Monti, neatly bisecting the enclosure of Bakong.

Conclusion

The use of space at Préah Kô contrasts sharply with that of Bakong. Both temples were associated with ancestral veneration, but at Bakong this was at a royal rather than the personal level which typifies Préah Kô. The layout of Bakong appears designed for ceremony. While not intended to meet the congregational needs of lay devotees, the demarcated space offers processional areas for royal or religious officials. In addition, the area between the first and second moat of Bakong, while eminently suitable for monastic residences, is not suggestive of a royal palace and associated aristocratic urban

³⁴ Both these features are noted in the March 1932 report of Trouvé for the EFEO. He suggests that Srah Nge may be the temple of Prasat Dei Dom (no.588) in the *Inventaire*.

³⁵ The moat extends some 300 metres north-south to the north of the temple platform but only about 200 metres north-south on the south of the temple platform.

quarter. Préah Kô, by contrast, offers a huge amount of space within its moated enclosure that may well have contained a palace and elite housing. The temple and its two inner *enceintes* occupy less than ten percent of the moated land of Préah Kô.

Bakong was fundamentally a ritual centre on a scale intended to reinforce royal power. Its *naga*-lined esplanade is of grand proportions. Upon crossing the moat and entering into the temple area, the eye is drawn up to the tower on the summit of the stepped pyramid. This verticality and openness is totally different from the increased intimacy and restriction which characterizes Préah Kô. This deliberate opposition in architectural programme mirrors the distinctions - royal versus personal, collective versus specific - discussed in the introduction to this paper. Préah Kô appears to have been designed for personal devotion. However, description of the towers as 'dedicated to the ancestors of Indravarman I' fails to convey the power and strength afforded to the king through embodying their living presence. The propitiation of named and deified ancestors was the 'reality' of the shrine, one simply augmented and facilitated by the dedicatory inscriptions.

Hariharâlaya was the first city to be built after the inception of the *Devarâja* cult. When Yasovarman moves the court to Angkor, the conception of the city revolves around the natural hill of Phnom Bakheng. No such topographical feature appears to have constrained or encouraged the layout of Hariharâlaya. Much has been written on the meaning of the *Devarâja* cult, based on the epigraphic record. The point here is to call attention to the new ordering of the world created at Hariharâlaya, the first '*Devarâja* city'. As rich as the epigraphic record is, it necessarily concentrated on the needs of the priestly class in relation to the king. So too, of course, did the royal city, but in its three-dimensionality, it has an existence in relation to the particulars of the Khmer lands. In this sense it does not express the relationship of the Khmer to the earth, the water, and its spirits - it creates it.³⁶

³⁶ The support of the Royal Angkor Foundation (Budapest) [RAF] is gratefully acknowledged, enabling fieldwork in Cambodia, and providing documentation from the RAF Préah Kô Project. All errors, however, are the responsibility of the author.

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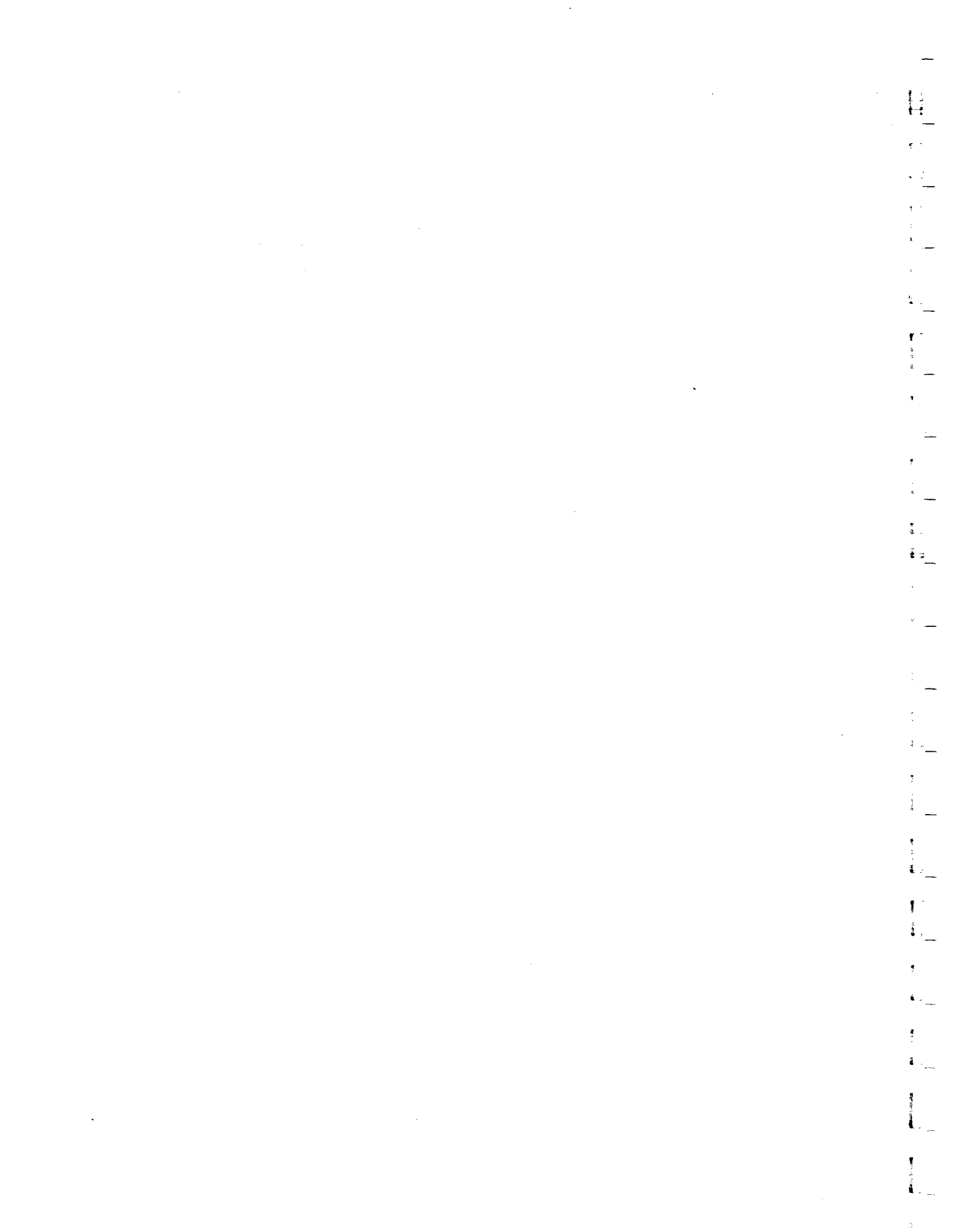
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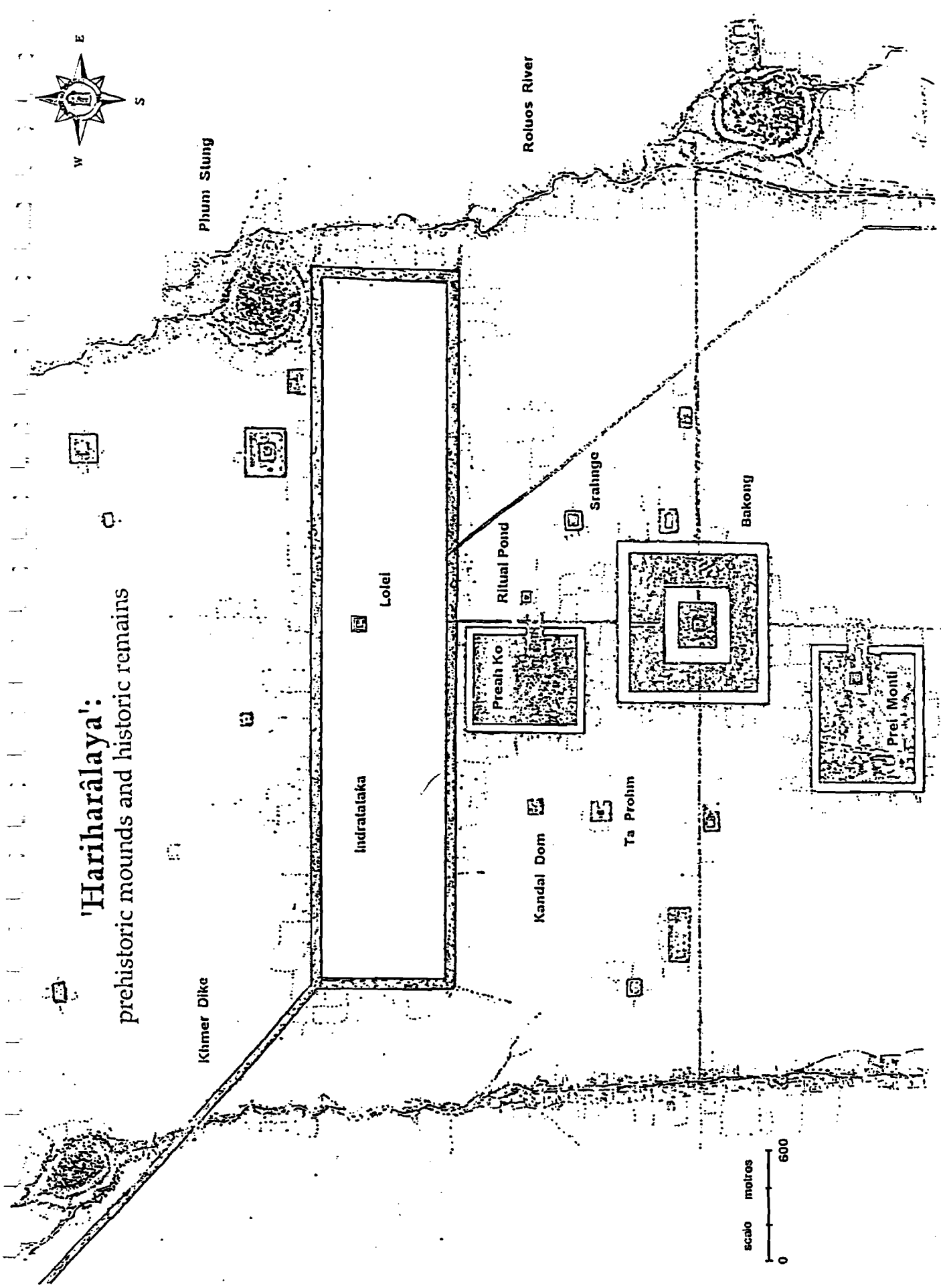
ILLUSTRATIONS

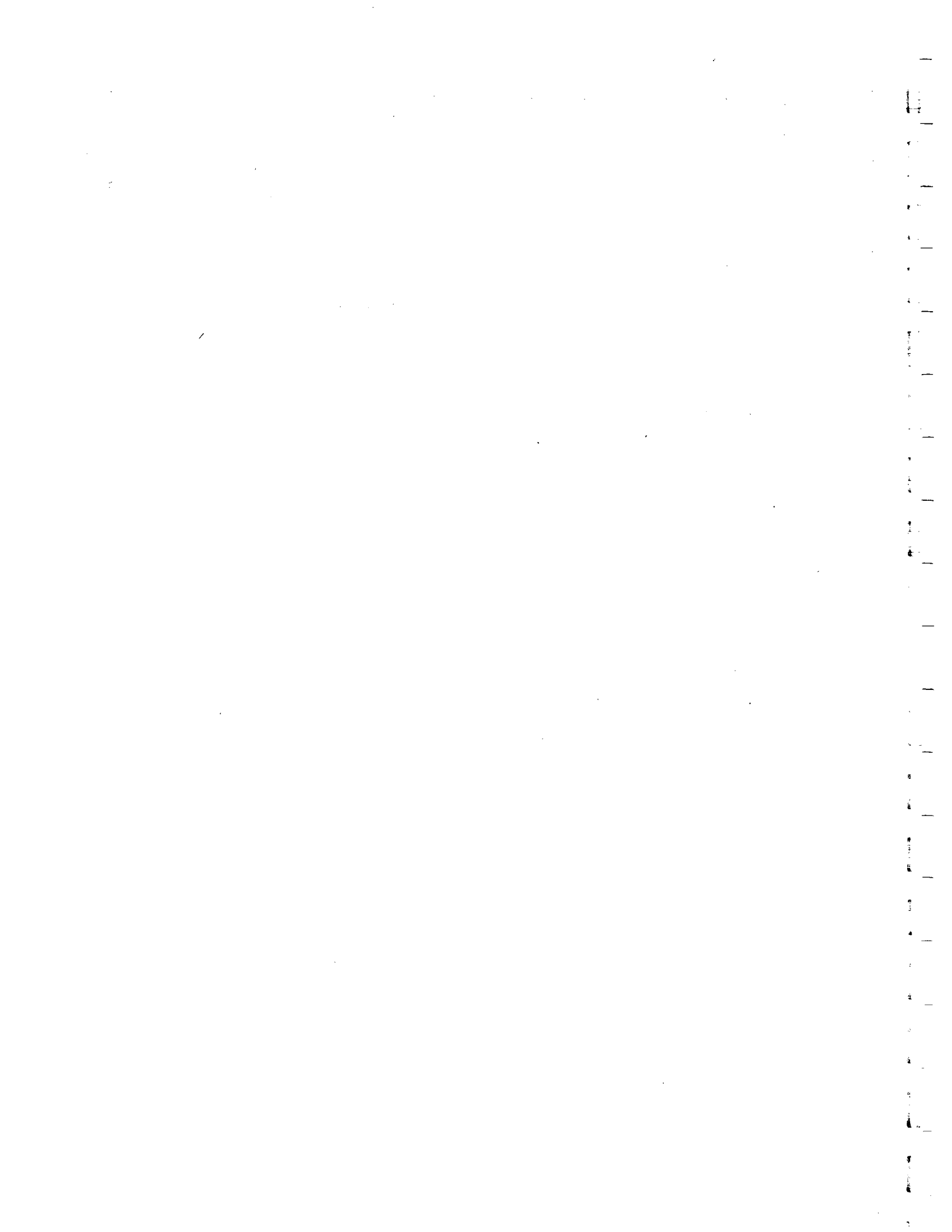
1. **Map of Hariharâlaya** R.deLancey on behalf of RAF (Budapest)
The map was traced from enlargements of 1992 1:25,000 Finnish cover of the region.
2. **Plan of Préah Kô** R.deLancey on behalf of RAF (Budapest)
The plan was drawn using existing French plans and ground survey at the temple in December 1994.
3. **Plan of temple platform** J.Vadja on behalf of RAF (Budapest)
The plan was produced photogrammetrically from pictures taken at the temple in 1993-1994.
4. **Elevation of Central East tower** J.Vadja on behalf of RAF (Budapest)
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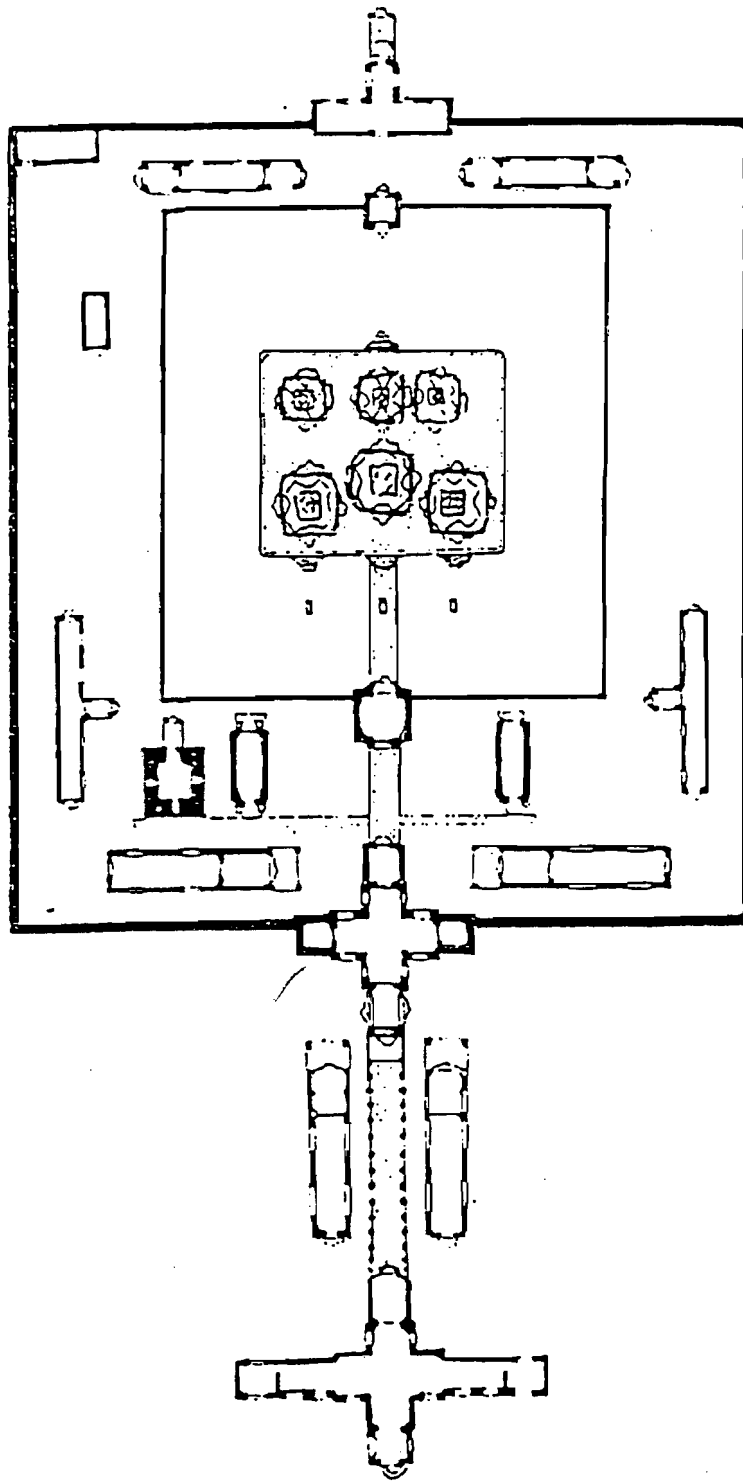
'Hariharâlaya':

prehistoric mounds and historic remains

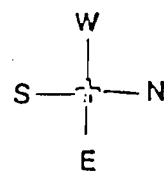




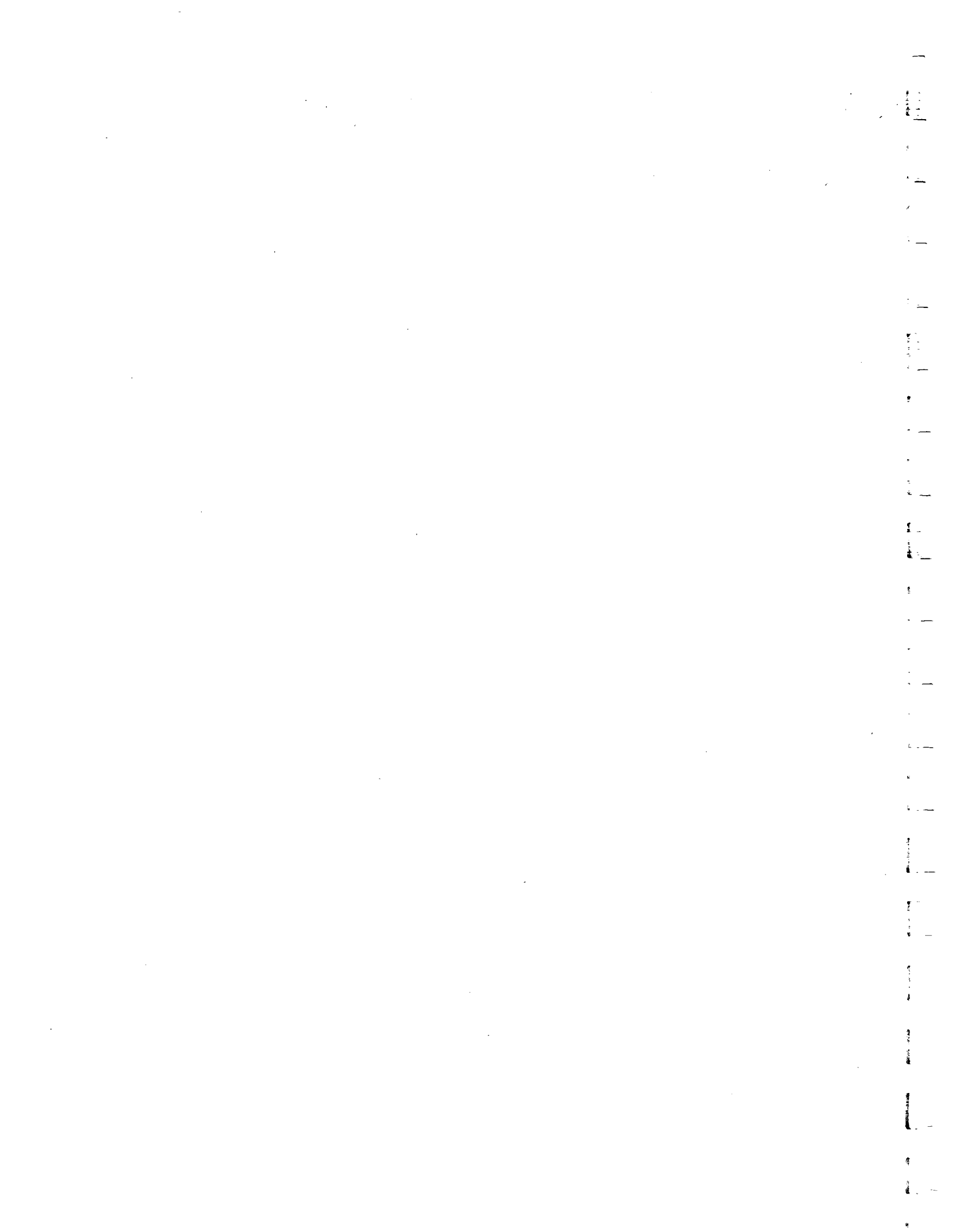
Preah Ko

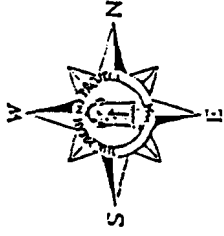


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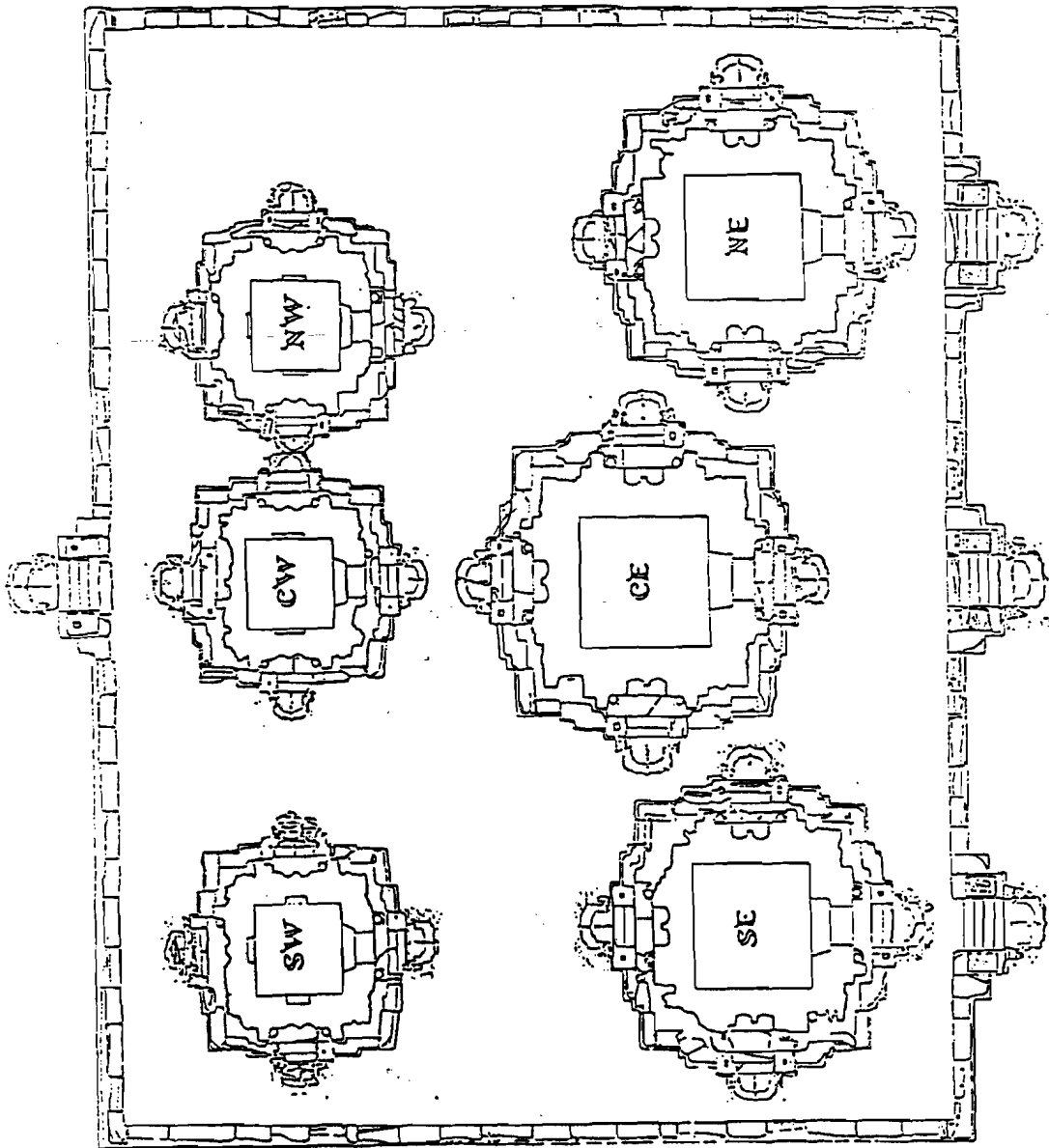
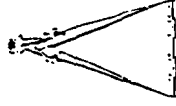


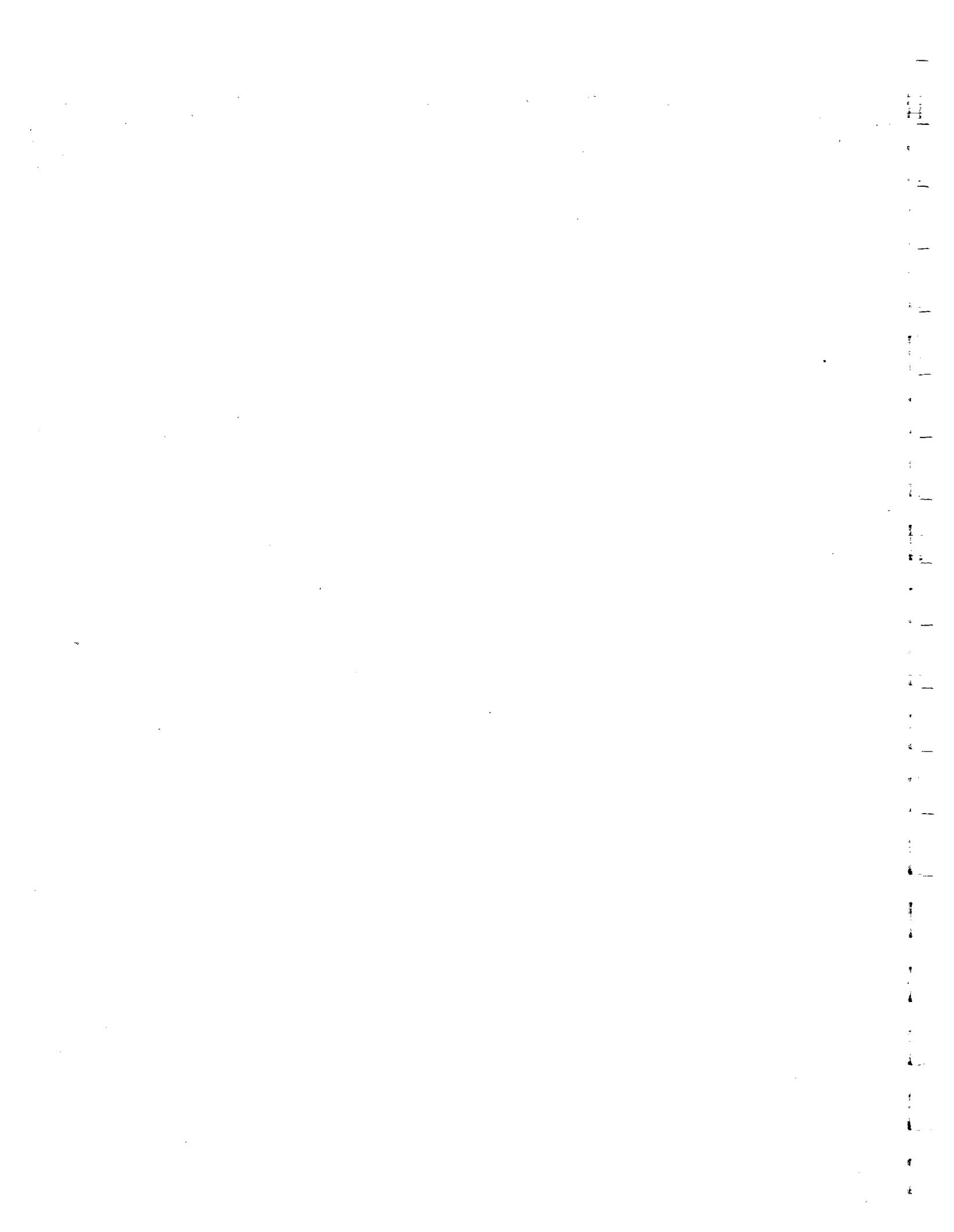
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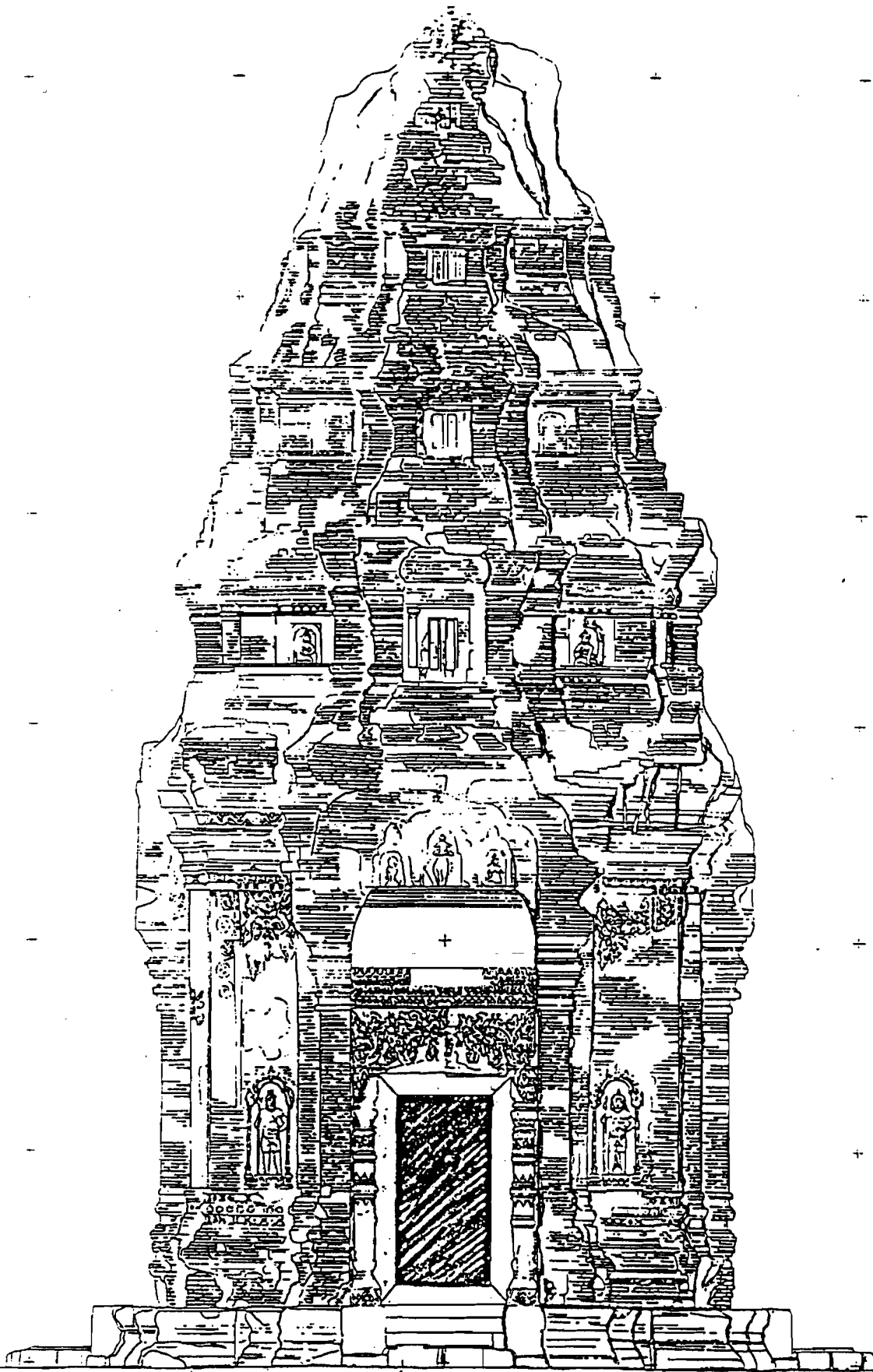


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