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NOTICE: The languages used during the sessions of the ICC are English, French and Khmer. In the record of the discussions, all material spoken originally in French or Khmer is therefore a translation. Presentations and comments made originally in English are indicated by [OrigE] at the beginning of the contribution. The insertion [OrigK] shows that the original statement was in Khmer.
GENERAL RECOMMENDATIONS

Number 1

The teams working at Angkor, classified as a World Heritage Site, are reminded of the vital importance of making the most meaningful contribution possible to framing a proper MANAGEMENT PLAN necessary for sustainable development. The primary purpose of such a contribution is to assist the APSARA National Authority in its capacity as project owner to have before it practical directions and operational information to ensure the routine management and long-term maintenance of the site. The ICC therefore urges each team to provide the APSARA National Authority with documents as follows:

a) Periodically forward a copy of activity reports along with a list of problems relating to the risks intrinsic to the site;

b) At the conclusion of operations when responsibility is handed over, provide a special report outlining the key elements of an operational protocol for site and monument management. It is important that the said report include the following six points:

1. A summary statement on the heritage value of the particular monument in the overall context of the World Heritage Site;
2. A rundown of the specific tangible and intangible features of the monument that embody the said value;
3. A description of factors that are affecting or that could affect the heritage value of the monument, as well as an analysis of possible interactions among these factors;
4. The priority objectives for the conservation and showcasing of the monument, with reference to the aforementioned factors;
5. A detailed description of what action is needed for the up-keep of the monument and achievement of the aforementioned objectives, spelling out the norms and periodicity of required interventions;
6. A protocol for monitoring the monument, based on the criteria of user-friendliness and focusing on key indicators directly linked to the dynamics that is put into play by the factors listed under point 3 above.
Number 2

The ICC recommends that the Standing Secretariat submit once a year at its Plenary Session a report to the Committee outlining the efforts put forth and progress made to implement the approved decisions and recommendations during the year following the previous Plenary Session.

I. CONSERVATION AND RESEARCH

A) Conservation

Number 1

Sustainable safeguarding of the Angkor site requires a proper management tool. The ICC finds that the proposals put forward in this connection by the Representative of the World Heritage Center are most fitting and lends its full support to this initiative. The recommendation is therefore made to draw up a management plan in keeping with the Operational Guidelines for the Implementation of the World Heritage Convention. The APSARA National Authority is now desirous of having such a plan, which must include among other things a general methodological framework for conservation, restoration and maintenance operations on the monuments. From this standpoint, the ICC is appealing to donors (governments, public or private institutions, individual benefactors) to provide technical and/or financial support for preparation of the management plan, as a matter of priority.

Number 2

Considering the functional relationship and fluctuations observed in the water level of the Tonle Sap Lake on the one hand and of the Mekong River watershed on the other, it is recommended that a representative of the Mekong River Commission be invited to attend the next meeting of the ICC (December 2006) and present a report on this matter.

Number 3

The ICC is pleased with the decision made by the Royal Government to entrust to the APSARA National Authority the safeguarding and showcasing of Koh Ker, a major archaeological and monument site.

It is recommended that:

a) The ad hoc group of experts conduct a monitoring and assessment mission on the site;
b) Members of the Committee who have archival documentation on the Koh Ker site and monuments kindly forward a duplicate thereof to the APSARA National Authority through the ICC Secretariat;
c) Teams interested in a bilateral or multilateral cooperation arrangement on the site make their intentions known at the upcoming Plenary Session of the Committee (December 2006).

**Number 4**

In the light of a recent revised reading of an important Sanskrit inscription (stele from the Mangalārtha temple) dating back to the early 14th century, a new chronology is proposed for the reigns of Jayavarman VII (now 1182-1220), Indravarman II (1220-1270) and Jayavarman VIII (1270-1295).

Given this new chronological insight that will have a definite bearing on the history of the Bayon and changes made to its layout, the ICC recommends that the JASA team look into the possibility of doing some test probes under the Bayon central tower to make sure of its stability. Such probes may also make it possible to confirm in the field the reading of the new epigraphical data, with a view to accurately establishing the history of the temple’s construction. More importantly, this operation will make it possible to come to a speedy decision as to whether or not the central tower should be closed to visitors.

**Number 5**

Any sustainable conservation process for stone monuments is directly dependent on the durability of this material. The study of stone deterioration proposed on a partnership basis by a research group from Blaise Pascal University, Clermont-Ferrand, France, is therefore one which is of interest to all national and international teams operating at Angkor. The ICC recommends that this study project be given final approval. It will focus on Ta Keo Temple and extend over a four-year period (2006-2009). An appeal for contributions is hereby launched, and each team is asked to kindly take the matter up with any donors and/or laboratories that may be interested in this study theme.

**Number 6**

The ICC recommends that emergency measures be taken to safeguard the Preah Khan-Kompong Svay Temple and to protect it from looting.
B) Research

Number 7

In the light of a consultation session with the APSARA National Authority, the ICC recommends that the upcoming workshop (fourth in the series) that it will be organizing in conjunction with the 16th meeting of the Technical Committee in June 2007, be built upon the theme:

“Assessment of Advanced Methods and Techniques for Enhancing Cultural Heritage Value and Communication”

A report on the outcome of this workshop—to be multidisciplinary and international—will be submitted to the ICC.

II. SUSTAINABLE DEVELOPMENT

Number 1

The ICC is pleased to see that the APSARA National Authority intends to find solutions—that will hopefully prove to be permanent ones—to the problem of pollution, now at a very high level, on the World Heritage Site.

One of the main aspects of this problem is road traffic involving vehicles of all types and sizes. It is therefore recommended that an electrically powered shuttle service be used to take visitors to and from the temples.

In this regard, the ICC makes the following urgent recommendation:

1. Prior to a final decision with regard such a system, take a survey of the various publics, in particular visitors on group tours;
2. Pay particular attention to the social problems that may result if light forms of transportation are eliminated such as motorbikes, motorbikes towing an open platform (referred to as l’morks in Cambodia and tuk-tuks in Thailand);
3. In the event one or more systems of non-polluting transportation is chosen, the decision must be made transparently and based on competitive bidding, so as to ensure genuine benefits for the APSARA National Authority and tourists alike.

Number 2

Subsequent to the presentation of outstanding studies recently conducted by the JASA team, including the pictures developed by the School of Interdisciplinary Information Studies, University of Tokyo to create a virtual tour of the Bayon Temple, the following recommendation is made:
a) In order to study what needs to be done for the international use of this information, establish contacts with the UNESCO World Heritage Center in Paris;
b) In order to enable visitors to Angkor (Cambodian and foreign tourists) to enjoy this attractive documentation, such as at the future “Visitor Intake and Information Center,” establish a cooperation arrangement with the APSARA National Authority’s department in charge of tourism management.

Number 3

A diversification of the tourist offer (cultural heritage, forests, natural sites, cultural landscapes and beaches) will definitely contribute to tourism development. It is likewise certain that offering a larger number of itineraries in and around the Angkor zone, especially to traditional villages, will be a further drawing card.

The ICC therefore recommends strongly that the technical services of the APSARA National Authority’s Tourism Development Department be strengthened so that it can quickly get up and running the itineraries that have been proposed on the basis of in-depth field surveys and analytical studies of points of interest on the sites slated for visiting.

Number 4

Having been briefed on the content of a technical lighting plan for the Angkor monuments proposed by Sou Ching Electronic Co., Ltd., the ICC would like to stress the necessity of taking into account the requirements of preserving the authenticity and visual integrity of the site—crucial to its exceptional heritage value—as well as international standards in the matter of protecting and showcasing properties included on the World Heritage List. Similarly, the ICC insists on the need to avoid any disturbance of the cultural and natural landscape of Angkor and to avoid any risks to the monument perimeter areas and subsurface of the site. The ICC therefore recommends with insistence that, prior to the necessary step of submitting the tentative project to the ICC for approval, the technical file be studied by both the ICC ad hoc experts and the ICC Secretariat. An opinion will be forwarded to the APSARA National Authority as quickly as possible.

Number 5

Aware of the critical role of water and the environment for sustainable development in the Siem Reap / Angkor region, the ICC recommends with insistence that these issues be considered as a matter of priority, as follows:

a) Regarding water
- That a master plan for the supply and distribution of clean water be established as quickly as possible in conjunction with the Master Plan for the Town of Siem Reap being developed by JICA;
- That, for implementation of the proposals made in the Master Plan for the Town of Siem Reap, a system of coordination be put in place involving all concerned Cambodian authorities, as well as an ongoing process of monitoring and evaluation;
- That a search be undertaken to find additional or alternative sources of water;
- That an awareness-raising campaign be undertaken soon on the theme of avoiding wasteful use of water;

b) Regarding the environment:
- That deforestation operations in the Mount Kulen zone be halted as quickly as possible;
- That a tree-planting campaign be undertaken in zones threatened by erosion;
- That national and international assistance be provided to strengthen the efforts recently undertaken by His Excellency the Governor of Siem Reap to clean up the banks of the Siem Reap River.
I. OPENING SESSION

I.1. Statement by the Co-chairman for France, Mr Dominique Dordain, Advisor, Cooperation and Cultural Action Department, Embassy of France

"Your Excellency the Governor, Honorable Secretaries of State, Honorable Director General, Honorable Ambassadors and Chargés d’Affaires, Distinguished Guests,

Welcome, all of you, to this fifteenth installment of the Technical Committee of the International Coordinating Committee for the Safeguarding of Angkor. I would especially like to welcome those of you who are attending this session for the first time, including firstly HE Sou Phirin, Governor de Siem Reap, HE Thong Khon, Secretary of State with the Ministry of Tourism, HE Mrs. Donica Pottie, Ambassador of Canada, Mr Marc Storella, Chargé d’Affaires for the United States, Dr Sharma, Co-director General of the Archaeological Survey of India, Professor Giuseppe Proietti, Head of the Italian delegation, Ms Christine Albanel, Chairperson of the Versailles Public Institution, Ms Mireille Grubert, director of the Chaillot Center for Advanced Studies as well as Mr Giovanni Boccardi, from UNESCO’s World Heritage Center, who is with us for the first time.

Before opening our proceedings, I would like to make a few small recommendations, such as turning off hand phone ringers. I would also ask those who will be speaking to keep their contributions within the allotted time and, while doing so, to speak relatively slowly so that our interpreters can keep up.

We are entering the year 2006 with a new lineup and among the respective areas covered by the Technical Committee and the Plenary Sessions, we are seeking to see things unfold in such a way that the experts and scientific and technical teams have a greater opportunity for interchange and comparison of viewpoints and can express themselves during these three days. And it’s the first time, if I remember correctly, that our meeting is spread over three days. I would like to highlight five points of general interest:

First, with regard to monument conservation, with the rescue phase basically completed, we are now finding that the main problems reside in the area of restoration doctrine and designing, which I might even refer to as conservation governance. Phnom Bakheng has its structural problems in a fragile ecological setting. We have the Angkor Wat galleries that involve bas-relief conservation, as well as Ta Prohm temple with its one-of-a-kind stone and jungle combination, not to mention the Baphuon temple with the step-by-step plan to open it up to the public again.

These changes call for stronger coordination, ongoing communication among the various stakeholders and an open confrontation of methodologies. The role of the ICC’s Technical Committee, aided by the ad hoc group of experts, must be asserted in this area, because arriving
With an increasing number of major restoration projects coming to completion, this is also the time to look ahead and prepare for the later phases of maintenance and upkeep, as recommended at the last Technical Committee meeting in June 2005.

In this post-restoration phase, the APSARA National Authority will play the leading role, and the support of the Technical Committee will remain paramount. This job that is humble and unsung by nature is nevertheless consequential given the recommendations contained in the Venice Charter, from which I would like to quote a few key concepts:

- Monument conservation firstly involves ongoing upkeep
- Conserving a monument means doing so in keeping with its scale and specific features—to which I would add—personality
- The monument is inseparable from the history of which it is a witness and the environment in which it is located, referring to archaeology and nature.

These few thoughts bring us to a second major subject, that of presenting the monuments to visitors and visitor safety.

Here again, the APSARA National Authority with the assistance of all its partners, must prepare for the new requirements of showcasing the monuments, balancing esthetics with respect for the natural landscapes and forest setting and safety. That will be a major focus in the near future.

More teams and more providers of international assistance have made the decision to give attention to these issues by supporting the APSARA Authority in its efforts to ensure an integrated presentation.

‘More visitors’ is a financial objective, but ‘better visitor intake’ is a cultural requirement and therefore one of the purposes of long-term development.

Regarding research, the same processes will lead to expanding this field and opening it up to new areas of investigation that, because they involve an ever greater diversity of specializations, make it mandatory to have full coordination and close cooperation among the national and international teams.

These new fields of research are territory wide in their scope and highlight the necessity of:

- First of all developing archaeological surveying, which is complementary to these research efforts and a tool to safeguard the evidence and insight gained. Moreover, when properly integrated into the process, archaeological surveying is an asset for development, not an obstacle to it. We can be happy about the keenness with which APSARA is undertaking this job and we will continue to give it our support, notably when it is undertaking a proximity or preventive operation, preparing for various forms of roadwork or tourist amenity work.
- The ICC must be given the means to assume its responsibility by having an archaeologist join the ad hoc group of experts, as planned, in order to provide enlightenment from his field of expertise.
experience when preventive measures have to be taken or some operation has to be broadened in scope.

And since our discussions will deal variously with archaeology, restoration and sustainable development, I might add that Angkor Archaeological Park is undoubtedly the driver for development in the Siem Reap / Angkor region. Development of the park itself can be expanded to development of the region, with the park driving not just development but sustainable development.

Infrastructure suited to the constantly growing tourist flows, designed in such a way to spread the people out in space and time, is a basic tenet of the sustainable, harmonious development equation.

The ICC and the international community have the primary obligation to help maintain consistency in the archaeological park’s development program and operational system.

This involves seeing to it that infrastructure, amenities and operating systems are holistically respectful of:
- Heritage and its natural setting;
- Visitors, who are deserving of the highest quality intake and experience;
- The people living in the park, who have to be made aware of the requirement for site preservation and helped to see what’s in it for them socially and economically.

This latter point is no doubt crucial: the systematic involvement of the resident communities in all projects is a fundamental requirement for the harmonious operation of a park with people living in it.

It is important that this mission be strengthened: the role of the APSARA National Authority and ICC should be to encourage national and international investors—whose integrated projects should be supported—to develop solutions in a systematic manner to promote the involvement of the resident communities. I think that this matter of the relationship between public initiatives and private initiatives should be dealt with on our agenda.

With regard to the environment and milieu—a crucial consideration according to the Venice Charter—it must be kept in mind that the traditional landscape, one of the major assets of Angkor Archaeological Park, was fashioned by the people of Angkor. Most of today’s park inhabitants descend from the founders of Angkor and are undoubtedly the best partners to ensure landscape preservation. They should therefore be involved in all of our initiatives.

The Technical Committee also has the job of selecting structuring projects to enable this traditional society to cash in on the benefits derived from major essential projects such as the visitor intake center, urban development initiatives or the vital matter of ensuring the sustainable management of water resources.

One of the key elements of the system is the visitor center. We heard a presentation about the design study for it a year ago already. It will address all of these concerns. We are hoping that this design study will now quickly be fleshed out by concrete, coherent operations.
I would like stress the key role played by the APSARA National Authority in this interdisciplinary mechanism. The Royal Government of Cambodia is inviting the international community through cooperation activities to focus its efforts so that the APSARA National Authority can become fully involved in its missions.

Strengthening the APSARA National Authority is firstly a matter of refining its internal organization and operating procedures to make itself more efficient and professional.

We can summarize here the major centers of attention alluded to previously:
- Making sure that the structure of each department is consistent with the operational flow chart of the institution
- Establishing a personnel management policy in terms of recruitment and career path, as well as skills
- Capacity development at all levels by means of training and skills training.

In this regard, we cannot but welcome the materialization of interchanges with the Versailles Public Institution and its Angkor counterpart, who have many points in common, as Ms Albanel will tell us later.

There are still many expectations on the institutional level, but undoubtedly the APSARA Authority will gain a lot with regard to both serviceability and visibility when it finally has its own headquarters building and puts under one roof all the operational departments that are scattered at the present time. For this reason we hope that this building will go up in the very near future and find its place among the major government buildings in Siem Reap.

I am on the last leg of my mission in Cambodia. It has been an honor and great pleasure to have shared in meetings at the Technical Committee and Plenary Session level since the 9th session. I can see the great distance we have covered, notably since the Paris Intergovernmental Conference on Angkor in November 2003. This ‘Angkor spirit’ has pervaded our committee, making it a crucible of successful multilateral cooperation, a model of coordination and harmonization. It is referred to time and time again in Phnom Penh in our discussions with other donors, in keeping with the terms of the Paris Declaration on Aid Harmonization formulated on July 7 and 8, 2005 under the aegis of the OECD."

I express the wish for the full success of our proceedings that for the first time will go on for three days, given the wealth of information to be presented and discussed. Thank you for your attention.”

I.2. Statement by the Co-chairman for Japan, Mr Susumu Inoue, Minister with the Japanese Embassy

"Excellencies,
Honorable Co-chairman,
Ladies and Gentlemen:

* Organization for Economic Cooperation and Development.
It is a great pleasure and honor for me to have the opportunity today to chair this Technical Committee meeting of the International Coordinating Committee with my colleague, Mr Dominique Dordain, Advisor to the French Embassy.

I am happy to have the chance to make a contribution through this Committee to safeguarding the historical monuments of Angkor which draw some 500,000 foreign tourists annually from neighboring countries as well as from countries as faraway as Europe and America.

Angkor’s charm is found in its diversity, its boundless scope in space and time and its divine beauty. But it is not limited to its unique, solemn architecture. It reveals itself most beautifully and fascinatingly when it is showcased with the nature that embraces it—the sun, mountains, forest and water. This delightful, precious harmony must not be destroyed. It is also very fragile. This irreplaceable heritage was left to us by the Khmer ancestors a long time ago. It is our joint and supreme duty to protect it from the capricious forces of nature and from the repeated negligence of man.

In recent years, the issue of ‘cultural heritage conservation’ and ‘sustainable development’ is becoming increasingly important. For this reason, tourism development and environment are more hotly debated topics within the ICC.

I am certain that the matter of water control is vital for this region once known as ‘Cambodia of the Water’. Equitable development cannot take place without effective control of water. The historical monuments of Angkor would be lifeless without water.

Allow me to express the wish that our agenda will be equal to the task of responding constructively to this new challenge ahead of us. Thank you for your attention.”

I.3. Contribution by Mr Teruo Jinnai, Representative of the Director General of UNESCO in Cambodia

"Honorable Co-chairmen,
Excellency, the Director General of the APSARA National Authority,
Excellencies,
Ladies and Gentlemen:

It is once again a great honor and pleasure for me to make a statement on behalf of the Director General of UNESCO, Mr Koïchiro Matsuura. The ICC’s Technical Committee has come together here for its 15th meeting. This figure and the large number of participants testify to the importance that each one of us—representatives of the UN, representatives of countries friendly to Cambodia and, of course, the representatives of Cambodia—attaches to the safeguarding and development of the historical site of Angkor as well as to the untiring efforts that have been put forth. During its soon 13 years of existence, the ICC has grown and matured in parallel with the reconstruction of Cambodia and its institutions. The scope of the restoration operations undertaken and the speed of development in the Siem Reap / Angkor region have gradually given a new dimension to the task of coordination incumbent upon the ICC which is now at the core of a key factor in rebuilding the Kingdom of Cambodia.

Today’s meeting is crucial due to its character. It is the Technical Committee of the ICC. The technical nature of the discussions that will take place before us is essential to present the work being done in the field, in whatever area it might be, and to ensure effective follow through.

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Comité International de Coordination pour la Sauvegarde et le Développement du Site Historique d’Angkor
Quinzième Comité Technique - 5, 6 & 7 juin 2006

International Coordinating Committee for the Safeguarding and Development of the Historic Site of Angkor
Fifteenth Technical Committee - June 5, 6 & 7, 2006
Thus, through the contributions that will be given this afternoon and tomorrow, the many experts, archaeologists and scholars making their knowledge and energy available to serve this immense World Heritage Site will have the opportunity of presenting and exchanging their viewpoints on the two key issues on which the ICC is hinged: Safeguarding, Conservation and Research on the one hand, Sustainable Development on the other.

It is obvious to all of us: Safeguarding and development are inseparable and we must always look at one in relationship to the other. An extraordinary contribution has been made by prestigious teams from many different countries and now that an increasing number of Cambodian professionals have been trained in these tasks, safeguarding and research activities are now in good hands, recognizing, of course, that this is a long-term undertaking. Nevertheless, the wholesome management of development that brings benefits to all while remaining friendly to the monuments and to the nature surrounding them is an issue that is growing and mutating as time goes on. This is testimony to the success crowning the outstanding safeguarding work that we have undertaken together—international stakeholders and our Cambodian hosts—as well as to the new sets of problems brought on by this success.

The recommendations that will be made subsequent to these discussions will certainly reflect this dual dimension of the work incumbent upon the ICC. They will be presented to the Committee in the presence of HE the Deputy Prime Minister and Chairman of the APSARA National Authority during the concluding session on the morning of June 7. Once again, these recommendations will be presented by our Permanent Secretary, Mr Azedine Beschaouch, Scientific Advisor for the Culture Sector within UNESCO, whose impassioned commitment, brilliant knowledge and wealth of experience as well as the warm bonds of trust that he has developed with the international stakeholders and our Cambodian hosts are major assets in the continued success of our partnership. Mr Giovanni Boccardi, from the World Heritage Center, has honored us with his presence. He will speak to us on strengthening protection for the Angkor site. Of course, we will enjoy the contributions of our three UNESCO ad hoc experts, whose wise advice is always listened to with rapt attention.

I would like to take this opportunity to thank the French and Japanese Co-chairmen for the continued support they are giving to the ICC, enabling it to continue serving year after year. I likewise pay homage to the presence of the Japanese Ambassador, HE Mr Fumiaki Takahashi, whose devotion to the ICC is both a stimulus and honor for us. I would like to again thank HE the Ambassador of Germany and Madam the Ambassador of Canada who are also with us, and who will be joined by HE the Ambassador of France tomorrow.

Honorable Co-chairmen, Excellencies, Ladies and Gentlemen, honorable representatives of the Royal Government of Cambodia and the APSARA National Authority,

It has been an honor for UNESCO to provide the services of Standing Secretariat of the ICC since 1993. In my capacity as Representative of the Director General of UNESCO in Cambodia as well as on behalf of my colleagues in Paris, please let me ensure you once again of our total commitment at your sides in this immense but so motivating task of preserving and developing the historic site of Angkor, for the greatest benefit of Cambodia and all Cambodians. I thank you for your attention.”

The French Co-chairman thanked the UNESCO Representative for his contribution and the Standing Secretariat of the ICC for its work in organizing the meeting, and then went on to open the proceedings of the Technical Committee, the theme of the first session being Safeguarding, Conservation and Research. The first speaker was invited to take the floor.
II. SAFEGUARDING, CONSERVATION, RESEARCH

II.1. Safeguarding: General Introduction

II.1.1. Sustainable Safeguarding of the Angkor Site, by Mr Azedine Beschaouch, ICC Permanent Secretary

“Allow me first of all to ask for your understanding. In reviewing the guarantors and guaranties involved in the sustainable protection and conservation of this World Heritage Site, I would like to go back to some events that, by twist of fate or good fortune, I have been associated with. So kindly overlook the times when I refer to this personal experience.

For the safeguarding of Angkor, obviously we must never forget the guarantors of this great undertaking. The foremost guarantor, allow me to state and to state strongly, is the King-Father, His Majesty NORODOM Sihanouk. This great initiative is the result of His incentive. Back in 1991, at the time of the Paris Agreements, may we remember that His Majesty came to ask, quoting Him, for ‘UNESCO’s protection’ for the Angkor site. At the time I was Deputy Chairman and Acting Chairman of the World Heritage Committee.

In 1992, His Majesty came up with the idea of submitting a request to have the site included on the World Heritage List. May all of us, the international community and our Cambodian friends alike, never lose sight of this fact that is something truly extraordinary from the standpoint of historians. At a time when people were talking about getting the country out of the misery to which wars had reduced it, at a time when people were talking about what to do to help the country rid itself of its woes, here the King was also thinking about history, and as he said before UNESCO, ‘I cannot think about the future of my country without safeguarding its past.’ The safeguarding of this past, He felt, could only be achieved through the symbol of the Khmer nation, that is Angkor.

So it is that He Himself took the initiative—I was Chairman of the committee that year; I speak of it because I personally saw it—to entrust me with an official letter to serve notice of the request. But He did not want to give the impression that He was making a commitment on behalf of all the political parties without asking them what they thought. So He got them all together at the time, and I might add—this is something that is not in the books for reasons I cannot understand—that only three of the four parties present were in agreement with safeguarding Angkor. The fourth faction, known as Democratic Kampuchea at the time, otherwise known as the Khmer Rouge, didn't want to safeguard Angkor. Here are the terms they used: ‘We don't want new colonialism at Angkor.’ Obviously, they felt that I, Representative of the Director General of UNESCO and the World Heritage Committee, stood for colonialism. A positive decision was eventually reached and we pulled out all stoppers to have Angkor put on the World Heritage List, which we succeeded in doing despite many odds.

I am mentioning all of that to highlight the fact that His Majesty the King-Father is the key figure as far as we are concerned. But it must also be truthfully said—and I am not doing so just as a formality—that the other guarantor was His Majesty NORODOM Sihamoni when He served as Ambassador of the Kingdom of Cambodia to UNESCO. For nearly a decade, I witnessed it, no delegation, expert or member of UNESCO went to the Kingdom on a mission for Angkor without His Royal Highness at the time sending a letter to facilitate things, as a reminder that He personally was committed to safeguarding Angkor. His soft spot for Angkor never faded, right up to the day he ascended the Throne of His ancestors.
It therefore must be said that our guarantors—God preserve their health and their life—are His Majesty the King-Father and His Majesty King Sihamoni. That is something very fortunate for us.

But besides guarantors, we need guarantees. Obviously, the guarantees have to be national, in the form of laws, rules and regulations. I would like to mention something that many of you now know that back in 1994, as soon as peace had returned, the monarchy was restored and the initial steps had been taken towards development and getting the country out of the facing peril it, we got something most extraordinary, the first Royal Decree. It was about Angkor. This was Kret or Royal Decree Number 1 of May 28, 1994. You can see thereby that from the standpoint of legislation, right from the start, this will of the King, followed by the will of the Government, showed that to ensure the sustainable safeguarding of this jewel of national heritage and symbol of the Khmer nation, there had to be zoning and long-term safeguarding: ‘Kret Number 1 of May 28, 1994 respecting the zoning and management of the Siem Reap / Angkor region’. I am mentioning these dates to make a point: twelve years ago necessary concern was expressed for zoning and management as keys to sustainable safeguarding.

Let me read two important extracts from this Royal Decree. Not only did it provide zoning for the central part of Angkor, the monument sites, along with Zone 2, the buffer zone for the protection of the main monuments. It went even further. At a time when very few countries were talking about cultural landscapes—let me add that in the world heritage system, it took over three years to get this entrenched at the behest of a number of countries including Japan, France and Germany who were very much behind the adopting of this idea of cultural landscapes. Back in 1994, you will find in the Cambodian law something very new, and I quote: ‘Zone 3, protected cultural landscapes; Zone 4: Points of archaeological, anthropological, ethnographical and geographic interest’. What was contained in UNESCO’s Convention on Intangible Heritage worded nearly two decades later is already found in embryonic form in Cambodia’s law. And the socio-economic and cultural development zones of the region, that is the 40,000 hectares included on the World Heritage List, are inserted in their natural setting, the 5,000 square kilometers of the Siem Reap / Angkor region, a large area indeed.

The second aspect that I would like to dwell on is the following: In Zone 2, construction development is not the only thing prohibited in order to protect the archaeological sites and monuments. Please also note this impressive statement, made back in 1994: ‘This zone is essential for the conservation of local, traditional ways of life.’

Condition number three, after having guarantors at the highest levels, after getting legislative guarantees in place, is of course international protection. In December 1992 the Angkor site was put on the World Heritage List. This was possible despite the absence at the time of all that was needed to support the inscription from the procedural standpoint. We fought a long battle and all of the countries that helped get Angkor on the list were convinced that it had to be put on to save it, not just have it on the list for the prestige of it. Angkor was a schoolbook example. It was put on the list even though at the time there was no national authority that we now know as APSARA, even though at the time there was no money to fund the work, even though at the time there wasn’t much in the way of an international presence. It was getting Angkor on the list that made a meeting possible, at the incentive of Japan and with the support of France and UNESCO, and that was the great international conference of October 1993.

That meeting was the starting point for a great movement, because the recommendations of the Tokyo Conference were seminal in two respects, firstly getting this Committee formed right away. That took place on October 13 and 14, 1993 in Tokyo. Barely two months later, we met in Phnom Penh from December 9 to 12 to set up the Committee, get in chaired by Japan and France.
and set up a Permanent Scientific Secretariat. It was my privilege to be selected for that Secretariat, and I can assure you that from 1993 to the present, this international coordination has been real and has been effective, thanks to the vigilance of Japan who took the initiative and of France who has worked closely with Japan in all of this.

We then realized that confidence in the future was the byword and we expressed this by saying: ‘five years open-ended’. I am impressed with the fact that no one was surprised by the decision made by France and Japan, ten years later, to hold a conference in Paris, in 2003. People might have changed, the various officials, the policies as well, but Japan and France did not forget and invited the Cambodian national authorities to come to Paris to commemorate the Tokyo meeting and remuster for a fresh start. So it was decided in Paris that another conference, ten years down the line, would take place, this time in Phnom Penh. So you see this continuity, which is also one of the prerequisites for the long-term safeguarding of the Angkor site, this continuity that has been behind all the work done by our Committee, this confidence in the future that was expressed despite changes in personnel, this Angkorian memory that has led to the fact that we can now be sure, with the establishment of the APSARA National Authority, that the strengthening of the process started in Tokyo and renewed in Paris, will go on uninterrupted.

With the three requirements already met, did we have all we needed to ensure the long-term safeguarding of this site, this jewel of world heritage? No we didn’t. We needed to fulfill two more requirements, both of which have been met to a considerable extent already.

Item four is that the National Authority had to take ownership of this World Heritage Site and play the role of project owner in the operation. This is what would guarantee that the flame will be passed on from the current association that links the international community and APSARA to the National Authority alone, when the Cambodian side will have enough technical staff—architects, archaeologists, engineers, site and monument managers—thereby enabling us to be sure that the National Authority would be able to take on what we call long-term safeguarding.

Things have moved along very well towards that goal. Why so? Because the requirement has already been partially met. In my capacity as a historian, I am only relating the facts. The fact is there. Because Japan took the initiative via UNESCO to contribute to continuing university education. My colleague, the Office Director, will be making a report on the way Funds-in-Trust managed by UNESCO, or rather Japanese Funds-in-Trust are supporting training in the Faculty of Archaeology and Faculty of Architecture of the Royal University of Fine Arts. Today, many of those who were trained by these two institutions are already working in operations to safeguard Angkor.

France, for its part, decided years ago in what is now referred to as the FSP, or Priority Solidarity Fund, to implement a different, but complementary approach. Japan’s training is academic. Those who graduate from university come and work for APSARA and round out their training there. That is where France’s contribution comes in. We have academic training followed by development training. This will be continued and enhanced even further. Ms Grubert will brief you tomorrow about a new institution that will be set up, a regional heritage training center. You see that we have an impressive continuity that allows us to be certain that our early hope that did not yet have any substance will be fleshed out in the field with training and skills development that will one day give the National Authority the means to take over all operations on this World Heritage Site.

There is a final requirement without which, obviously, we wouldn’t have any hope of safeguarding the site in the long term. We have the guarantors, the guarantees, the training. But
we need financial resources. For a long time, the APSARA Authority only had what the Royal Government could afford. Then tourism development made it possible for the APSARA National Authority to get more resources, and thanks to our Committee, let us not forget—at the insistence of our Co-chairmen—that that became possible. The records of our discussions show that our Co-chairmen, France and Japan, came back again and again to request that the Royal Government devote part of the tourism revenue to achieve the objectives set before the APSARA National Authority. That has now been cared for. Much of this funding allocation is enabling the APSARA National Authority to act.

But we hope that in the years to come, these financial means will be increased so that the APSARA National Authority can take charge, not just of the site and some of the temples but many other temples as well, in particular those that probably, if not certainly, could never be cared for by foreign teams. We are expressing this wish today. In fact, it’s a recommendation. Please allow your Secretary—who has had the good fortune and great honor of monitoring the whole process for the last fifteen years—to say ‘I am sure of it’. Those who were the guarantors are there and I hope they will be there for a long time to come. The relevant policy advocated by the Royal Government ensures us of this continuity. International vigilance, with the unfailing support of the UNESCO Director General, is backing up this ongoing partnership. The future certainly holds that which we envisioned in Tokyo, that which we confirmed in Paris and, hopefully, that which will be brilliantly reflected in Phnom Penh eight years from now.

Thank you for your kind attention.”

The French Co-chairman stressed the importance of the “Angkor spirit” referred to in his opening statement and so well illustrated by Azedine Beschaouch, before going on to explain that as early as 2004, HE Deputy Prime Minister Sok An had drawn the ICC’s attention to the matter of site management and zoning and that UNESCO had been asked to conduct a study. The French Co-chairman then invited Mr Giovanni Boccardi to take the floor and review the conclusions of that study.

II.1.2. Strengthening Protection of the Angkor World Heritage Site—Establishment of a Management Plan and Institutional Capacity Building, by Mr Giovanni Boccardi, World Heritage Center

“Let me first of all convey to you the best wishes of the Director of the World Heritage Center, Francesco Bandarin, who sends his regrets for not being able to be with us today. He intends to be on hand for the Plenary Session scheduled for December 2006. I would also like to thank the Cambodian authorities, notably the APSARA National Authority, for their welcome and superb organization of this ICC session and the site visits, in cooperation with the Secretariat and our colleagues from the UNESCO Office in Phnom Penh.

In my brief contribution, I would like to develop the following three points:

- Recognition of the outstanding results of the cooperation arrangement at Angkor;
- The need to strengthen protection of the site by putting in place a holistic management plan in order to confront the challenges posed by increasing pressure relating to development and the environment;
- Outline the objectives and scope of the type of management plan that we are advocating;

Our friend Azedine Beschaouch already spoke very comprehensively, so I will try to move very quickly on the first part especially, recognition of the outstanding results achieved over the
last 15 years. I think that everyone agrees: Angkor is a model of cultural cooperation in a post-
conflict situation and we are very happy about that.

Up to the present, the prevailing intervention model at Angkor has been project-driven. Indeed, since 1992, a great number of projects have been implemented, with the key focus being monument restoration, along with the development of digital cartography and thematic studies and research activities that have contributed tremendously to our understanding of site, its scope and value.

By definition, a project is an attempt to change something, ostensibly ‘for the better’. A strategic approach based on projects is often linked to a stable context and reactive thinking. A problem is identified and an attempt is made to solve it, such as a monument in a poor state of conservation.

Now, the context at Angkor has been anything but stable over the last few years. We all heard the statistics about tourist numbers, new buildings going up with or without a permit, and population growth. The report made by Mr Chabason mandated by UNESCO in September 2005 was quite clear in this regard. Other indicators can also be identified such as in the deforestation taking place, road work, infrastructure networks being put in, and pollution. Perhaps less conspicuous but no less important changes highlight economic activities, cultural traditions and individual behavior patterns. In the mid-term as well, we are going to have to deal with climate change, which is a determining factor in safeguarding Angkor because of its potential impact on the water regime.

Given the rapidity and extent of these things, the increasing complexity of interests and factors affecting Angkor, implementation of individual projects, although necessary and often exemplary, no longer appears to be providing an adequate response. A strategy based only on ‘reactive’ thinking and one-off interventions is no longer tenable. A matter of absolute priority is setting up an efficient, ongoing system to control and govern change on the basis of policies agreed upon by the various stakeholders involved. This is what our Co-chairman referred to a few minutes ago using the word ‘governance’. This involves a system based on clear procedures and having institutions endowed with sufficient capacities and resources.

From the standpoint of institutions and framing policies for management and conservation at Angkor, as Azedine Beschaouch just pointed out, the most seminal achievement has been the establishment of the APSARA National Authority and promulgation of this Royal Decree in 1994.

Despite the work and outstanding dedication of the persons involved, this system seems to be showing signs of weakness in governing the dynamics of land and the increasing human and environmental pressures that are being felt well beyond the area occupied by the monuments, beyond even the zones identified in the 1994 decree.

The time has come to set up management mechanisms that ensure a proactive, consistent policy in order to stay on top of a process that is continually mutating. This requires permanent mechanisms, but subject to periodic review, to plan out and control such things as land use, determine the criteria and priorities for monument safeguarding and implement a long-
term preventive conservation plan, manage tourist flows and ensure a quality visitor experience and prevent damage to the monuments, as well as assess the impact of any proposed operation either inside or outside of the site.

In the final analysis, the APSARA National Authority must have at its disposal a set of criteria and definite procedures to deal with all the technical and administrative matters involved in the routine management of the Angkor site, in this way affirming itself as the true project owner at Angkor.

In the long run, and with sustainability in mind, the function of technical and scientific support assigned to this Committee and its ad hoc group of experts would normally be
Yesterday we visited a number of sites, including Ta Prohm. I am choosing this site because it is a typical case to illustrate what I am talking about. Going right back to the time when it was first decided to live with these trees at Ta Prohm that now contribute so much to the value of the site, it is obvious that no specific project, as perfect as it could be, could ever ‘solve’ the problem and bring the site into an ideal condition, for the very reason that trees are always moving, by definition. The \textit{ad hoc} experts who accompanied us and held discussions with the Indian team, offered advice on this and that, but such advice was exactly that—\textit{ad hoc}—just as are the experts. So this is perhaps also part of the problem we are seeking to resolve: what we need is something not just \textit{ad hoc}, but general in its application.

It is necessary to have an operational protocol for the next 20, 30, 40 years. To some extent, Angkor is not unlike the Ta Prohm site, only on a much larger scale. Along with the trees, we have rain, tourism, development, heat, termites and all kinds of factors that are constantly changing and that we have to live with. Factors like that have to be managed and governed.

This governance framework is referred to as a \textbf{management plan} in the World Heritage Convention. This is something now required in the \textit{Operational Guidelines for the Implementation of the World Heritage Convention} and has become mandatory for all World Heritage Sites.

The World Heritage Center has therefore prepared a proposal for a management plan that we will be submitting to the national authorities and, with their agreement, to potential international partners. Firstly, the bottom line of this management plan for Angkor will of necessity have to be based on the broad experience acquired to date by the APSARA National Authority and by the various teams that have been working for years now on projects and research in and around Angkor. For instance, the document that Mr Croci will present shortly containing guidelines for monument conservation illustrates precisely the type of experience that we need to frame our management plan.

Secondly, a comprehensive framework of all issues relating to site conservation is required, dealing with factors such as monument deterioration, mass tourism, uncontrolled development, climate change, etc., in other words anything that can affect the heritage value of Angkor.

Thirdly, all of this experience has to be translated into proposals for policies and operational procedures at all levels, covering all matters relating to site management. In the future, each staff member of the APSARA National Authority at all levels, must know daily when going out to work what he or she is expected to do, how and when.

Such a plan will also provide an opportunity to review and subsequently redefine the real cultural significance of the Angkor site, including aspects relating to cultural landscape characteristics, which were perhaps given less emphasis in the original World Heritage nomination document. Obviously, the strategic options of this plan will have to be decided in thorough consultation with all concerned parties.

Meanwhile, as was proposed by Mr Bandarin, it will be necessary to provide the APSARA National Authority with two critical management tools: first, a valid ‘inventory of fixture’ or stock report, a land-use plan, a land register and a system of monitoring land use and development, which is something I am aware you are working on and for that reason we have included both of these tools in our proposal.

Throughout all of this, it will obviously be necessary to build the capacity of the APSARA National Authority in World Heritage Site management and make sure that it has the necessary human resources. It is felt that this can be done by means of training seminars as well as by
having a team from the APSARA National Authority associated with the project, which will subsequently become responsible for coordinating implementation of the management plan.

In conclusion, in a context wherein pressures are mounting and resources dwindling, it is crucial to develop a strategic approach, in other words plan out interventions on the basis of a holistic, long-term vision, considering the resources available both now and in the future. The management plan would be a fundamental tool for this.

Controlling the dynamics of development, notably land and water management, must be included in the objectives of this management plan and should be on the agenda of future ICC meetings and be given the same importance as monument restoration. Right now, that does not seem to be the case. The territorial dimension is indeed the true dimension of Angkor, one that enables us to fully grasp its significance. The World Heritage Committee has high expectations in this regard, including the possibility of extending the Angkor site to the Tonle Sap.

The success of the management plan is based on two fundamental pillars: the legitimacy of its strategic choices, and even more so the empowerment and sense of ownership felt by those in charge of its implementation, to wit the APSARA National Authority.

For this reason it will be fundamental to have political support for this initiative within the APSARA National Authority and at the national level, as well as in international institutions such as this Committee and the World Heritage Committee, which will be meeting in just a few weeks in Lithuania, at which time it will be discussing such things as the state of conservation of Angkor.

Meanwhile, it is important that all of the scientific and financial partners represented here contribute to this necessary effort for the safeguarding of the Angkor site and the sustainable development of its region. Honorable Co-chairmen, if we accept the principle that resources and efforts must focus firstly on the priorities, I feel that this management plan that the World Heritage Committee has repeatedly requested is a top priority right now. So on behalf of the World Heritage Center, I would like to take this opportunity to ask for your technical and economic support for the development of this management plan and therefore to drafting and finalizing this routine maintenance and management protocol, of which the work done by Mr Croci constitutes an eminent example. Thank you.”

Remark by the French Co-chairman: “Thank you, Mr Boccardi, for your presentation that was very in-depth and future-looking. You mentioned the possibility of extending the site to include the Tonle Sap. That is certainly something to think about, and I would like to make a few proposals for future meetings of this Committee. The aspects of water and hydrology are key issues for the future. We know that the Tonle Sap is the lung of the region, but it’s only replenishment is from the Mekong River floods.

We have good reason to be concerned about the multiplication of impacts on the Greater Mekong watershed caused by deforestation as well as the construction of engineering works upstream that are resulting in a drop in the Mekong flood level as the years and decades go by. Although I am not a hydrologist, it can be feared that one day the Tonle Sap just may not be refilled as it has been over the past tens of thousands of years. So I am suggesting that we consider this issue at our future meetings and perhaps invite the Mekong River Commission to attend and provide some insight regarding the region’s future in terms of hydrology. Obviously, all of your recommendations regarding zoning are extremely well-founded and will provide a basis for our proceedings in the months and years to come.”

Remark by Mr Azedine Beschaouch: “It is up to your Secretariat to make a record of certain points that can lead to recommendations. May I first of all explain that I had the honor four days ago of being received by the Chairman of the APSARA National Authority, HE Deputy Prime Minister Sok An and that, aware of the main points that my World Heritage colleague Giovanni Boccardi was going to mention, His Excellency confirmed that the APSARA National Authority was
very supportive of this initiative. So if our Co-chairmen will allow, your Secretariat would like to propose that we put as a first recommendation that, out of concern for the long-term conservation of the Angkor site, a management tool is necessary and that this management tool can be none other that what is now mandatory under the World Heritage Convention for all sites applying for recognition, i.e. a management plan.

So if you agree, we will prepare this recommendation, adding what our Co-chairman just stated, that is given the dependency of the Tonle Sap lake on conditions in the Mekong River watershed, we need a presentation based on a prior ad hoc study of this problem by a Mekong River Commission representative and that you have authorized us to include this recommendation, which will of course be submitted to the Committee for approval on the last day. Tradition has it that we first of all ask our two Co-chairmen if they agree, and we will then tell our friends on the Mekong River Commission that they are invited to our next meeting, given the significance of the problem.”

The two Co-chairmen approved the proposal made by the Permanent Scientific Secretary and the French Co-chairman turned the floor over to Professor Croci.

II.1.3. Guidelines for Restoration Procedures, by Professor Giorgio Croci, Chairman of the ICOMOS Special Committee and UNESCO ad hoc Expert on the ICC

“[OrigE]“I’m going to present you a document of recommendations. This document started four years ago, in agreement between the Cambodian authorities and UNESCO, in order to prepare some guidelines, a certain methodology to be followed by all the teams or people working here even if different techniques and technologies could be used in relation with different situations, different cases, different environments, etc. A group was created not only with UNESCO and the APSARA National Authority but also with the ad hoc experts and other experts on different teams working here. And this document that I’m going to show you is the eleventh revision that we have had from the year 2002 up to today.

I will start with the principles. I will go fast because time is limited and I don’t want it to be boring for you.

Some principles. First, authenticity. There have been many conferences, congresses on this and I want to spare words, but it has to be said that authenticity has to be interpreted in a flexible way in relation to the specific problems of the local cultural environment. Secondly, individuation of causes: it is obviously very important that before making any decision, the cause of damage or decay must be clearly determined. Thirdly, maintenance. Maintenance is very very important and adequate maintenance can limit the need for intervention. It is therefore a policy that always has to be followed. Fourth, minimum intervention. A monument is like a human body. We want to do the least possible, only what is necessary. So we start with minimum intervention, and certainly it has to be a compromise with safety and durability. Often, invasive intervention is not safer, nor does it ensure greater durability. I think that we have to choose between traditional and innovative techniques. I don’t think that we can say in principle what is better. It depends. Sometimes innovative techniques and technologies are softer than traditional ones. Material compatibility is very important. Too many errors have been made in the past using new materials that were not tested adequately. Negative side effects have produced irreversible damage or damage that required a lot of money and intervention to repair. Seventh point, repair, replacement, anastylosis. That is another important problem. We have to balance. Sometimes it is better to let a structure remain with its deformation, with its problems, in a certain way, instead of dismantling and rebuilding because often we lose authenticity and part of the history. Alterations are part of history. So we don’t have to consider a deformed structure as a negative aspect but also as the trace of its history.
Several other points are presented in the principles, but for now I limit myself to these 8 points.

Then we describe the structural typology: walls, arches, towers, mountain temples etc.

Walls are described as different kinds of walls, with different kinds of materials: laterite, brick, sandstone, etc. Walls are often retaining walls as in the cases of the mountain temples where all the walls also have the function of maintaining stability to the soil. And towers are one of the biggest, most important aspects of Khmer architecture. It is important to notice that there is totally different conception between Khmer, Indian and European arches. In Europe, we used to build arches with wedged blocks so that the joint is always inclined and close to the normal force, so that there is never a risk of slipping between the blocks. Here, the joints are horizontal so that friction becomes the main factor to ensure stability. For this reason, there are often huge loads on the crown of the arches, such as a huge Buddha head. So it is not only a religious and architectural aspect but also something that is necessary for stability.

For towers, the conception is similar. Also, towers are built with corbelled blocks and the stability is ensured as the rings are closed and the forces balance. When we have soil settlements, for example, several problems can arise in the towers but I will show that later.

Mountain temples are characteristic of the architecture on the site and it is important to study this kind of structure as a whole. Too often we start to study single aspects, single points of the building, but we have to remember that a mountain temple is first of all a structure that contains soil. So a global approach is first of all necessary, because if we don't consider possible soil movements, we run the risk of doing work on walls and other restoration that doesn't last because durability isn't ensured.

Next is a short presentation of the actions on the structures. We have different kinds of actions. We can individuate three kind of mechanical actions, which are the forces, the load of the trees, the pressure of the earth, that are static direct action. We have also indirect actions such as deformations. Soil settlements, temperature, etc. are not forces. They become forces if the structure is not free to deform and that is important because the approach to solve the problem is different if we have forces or, for example, forces induced by soil settlement. Those are very different in the approach. Then dynamic actions, such as earthquakes, winds, and so forth. But here, fortunately, earthquakes are not present and wind usually doesn't act on the structure except if there are trees, for example. Wind on the trees can produce problems.

The last point involves chemical, physical actions, such as the action of the vegetation, roots, wind, rain, which produce decay. So we have to consider all these actions together in order to individuate the best remedial action. This is how soil movements can create stresses that cause the tower to open and produce collapses as seen in several cases. Decay is a very big problem, especially in brick structures that are not protected by plaster anymore.

Organization of the work is part of what is referred to as the methodology. There is a certain analogy with the activity of a doctor. That is anamnesis—the history of what happens; the analysis—thorough tests and investigations; the diagnosis—to understand the causes of the damage or decay; the safety evaluation—to evaluate if the situation is at risk or not; the therapy and the quality control of the results of activity; and finally, maintenance.
Then, we have to speak of safety evaluation. That is a very important point because as we already said, we have to follow minimum intervention so we have to evaluate if the situation is at risk or not. So, we can follow three ways. One is historical research. To understand what happened in the past helps to understand what could happen in the future. We have to observe the structures, the decay process, cracks patterns, etc., because not all cracks are dangerous. We have to look and analyze with attention the structure.

And finally, structural analysis. Today, we have the possibility of using computerized programs to analyze and to better understand the structure. All three of these processes, these criteria, could be used together in order to correlate the different information and to put it down in what we have called explanatory reports to highlight why we decide that safety is at risk and why we say that intervention is necessary. I think that this is very important because the obligation to write, to explain a decision, will oblige the operator to reflect and to be more precise in the decisions.

Intervention criteria, very synthetically: Minimum intervention. In geotechnics this is known as observational criterion when we decide to operate with a minimum intervention and then to have monitoring, to look and see if this intervention is sufficient or not. That in some cases is a strategy that we could follow. Should we maintain the form of the shape or dismantle and rebuild? Environment, trees, archaeological ruins: we have already spoken several times about these problems and sometimes it would require that the structure be strengthened in order to support the pressure of the trees.

Traditional or modern techniques and technologies. Sometimes, especially in the past, we used reinforced concrete. The use of chain connections with steel or modern material such as carbon fiber are possibilities and have the added value of not having a risk of rust. The possibility of creating anchorages and giving strength to something that appears to be deformed and weak. To recover the form, sometimes we can use jacks or even recover parts of the soil movement.

New elements: sometimes some important elements are missing and we have to replace them. We have to be careful. Fortunately, in these cases, we have sandstones and experience shows that after some years, the stone takes the patina, a color very similar to stones that have been on the site for many years so we don’t notice the difference in these cases.

A very delicate problem to solve is, when we have to complete a bas-relief and we have discussions about the approximation that we have to follow in these cases, how to show the new from the old.

Controls. It is very important to have controls before starting operations, during the operations and afterward. We can use modern equipment: monitoring, endoscopy, sonic tests, models, etc. There are different methods of monitoring that make it possible to computerize the movements of cracks, of detachment, the leaning of a tower. With endoscopy, we can look inside the masonry and soil. Sonic tests give one an idea of the homogeneity of the structure. Mathematical models will allow understanding of the stress pattern and safety situation.
Now, the last point, that is the risk map. I think the risk map is a very important strategy to be followed. That means optimizing the resources, knowing in advance the risks, to program prevention measures, the cost of which is much lower than measures to be taken after damage and decay. (slide) This diagram shows how to reach a certain acceptable level of safety, which is the opposite of risk. A very small amount of money is sufficient. We have checked in several cases that out of the total the cost of all the restoration project, with 10 percent we can eliminate the higher risk and with 20 percent we can establish safety situations at least for a certain period, if we think of the durability of the intervention that has to be done. But I think that it is important as a starting point to reflect on how resources can be optimized in order to start with a program of prevention measures and to reduce, step by step, the higher risks. This is better than to start a project and to go full tilt and run out of money at the end.

To conclude, I think that at this point, it is very important to circulate this report and it would very important if all the teams that are working here give their advice, criticism, give input from their experience, positive or negative. We intend to implement documents with photos and drawings to make them easier to understand and more useful no only for experts but especially for the younger generation. I’m thinking particularly about the young generation of Cambodians architects, archaeologists and engineers, so that they can have a guide to help them in their decisions in their work. Thank you very much for your attention.”

The French Co-chairman stressed the significance of the document presented by Professor Croci, which will serve as a “pathfinder” for scientific discussions, and the Permanent Secretary pointed out that Dr R. K. Sharma, Co-director General of the Archaeological Survey of India, also agreed to share his experience in developing these guidelines. Mr Azedine Beschaouch also invited all teams to kindly forward their input to the Standing Secretariat of the ICC for inclusion in an expanded document that would be presented at the Plenary Session in December 2006.

II.2. Safeguarding: Activity Report by the APSARA National Authority

II.2.1. Introduction by HE Mr Bun Narith, Director General of the APSARA National Authority

“The 15th meeting of the Technical Committee is being attended as usual by the ICC regulars and faithful friends, and I would like to wish them an enjoyable and productive stay in Siem Reap / Angkor. Our program calls for three days of meetings and discussions about conservation and development projects on the Angkor site.

This morning’s site visit was an opportunity for those unfamiliar with Takeo temple to visit it. This temple will soon be taken on by our experts on the China Conservation Team for Angkor (CSA). We are delighted about that and extend our heartfelt thanks to the Government of China.

We are also much honored today to have with us Ms Christine Albanel, Chairperson of the Versailles Public Institution and Museum and I would like to welcome her. The Versailles Public Institution and the APSARA National Authority have signed a cooperation and technical assistance agreement that has already enabled our associates to exchange experiences in their respective areas of jurisdiction. I am certain these bonds of friendship and professional interest will be strengthened by Ms Albanel’s visit.

We also greet Mr Giovanni Boccardi from the World Heritage Center and a number of new participants also present to tell us about the activities and research work they are carrying on at Angkor with Cambodian experts.
I am happy to announce that the new Governor of Siem Reap, HE Mr Sou Phirin is with us. Immediately upon arrival, he showed his full support for what is being done to safeguard the ancestral monuments, protect the buffer zone and promote the sustainable development of the Siem Reap / Angkor region.

I would also like to congratulate UNESCO for the appointment of Mrs Françoise Rivièrè to the position of Deputy Director General for Culture and congratulate Mr Mounir Bouchenaki who is undertaking new duties as the Director General of ICCROM. Ms Rivièrè is well known for her constant interest in safeguarding, and Mr Bouchenaki for the development of archaeology at Angkor.

Since the 12th Plenary Session held in November 2005, the APSARA National Authority has been endeavoring to implement the recommendations made at the conclusion of that meeting. This has been done in cooperation with the representatives of the international work sites, who will report on their work. My colleagues will likewise present their activity reports during this Technical Committee meeting.

As for me, I would like to spend a few minutes on the various operations that were carried out:

**1.** Several visits were made to Ta Prohm temple to fine-tune the basic guidelines to be followed by the Archaeological Survey of India (ASI) and the APSARA National Authority. The ASI will be giving you a progress report.

**2.** The World Monuments Fund will outline its rehabilitation program for Phnom Bakheng and the environment of this monument. The APSARA National Authority’s technical departments shared in drawing up the future structuring operations that will enable the management of visitor flows, highlight the hidden aspects of other access roads, notably to help visitors enjoy the sunset experience.

**3.** I am happy to announce that we have freed up the necessary land around Banteay Srei temple so that visitor intake and commercial activity spaces can be set up. The Government of Switzerland will be able to move into Phase 2 of its program to showcase the monument.

**4.** A memorandum of understanding for a three-year partnership was signed with the University of Sophia for completion of the work on the Angkor Wat entrance causeway.

**5.** Mr Khuon Khun Neay will give you details on structuring work done in the Srah Srang zone, destined to become a future tourist attraction, linking it with tour routes that include villages close to the Srah Srang pond.

**6.** A tourist access platform at the Baphuon temple was opened on May 5 in the presence of the Ambassador of France and his associates, the Governor of Siem Reap and the APSARA National Authority. This space for visitor intake and presentation of the restoration work will enable visitors to see the vast Baphuon work site that has been closed to visitors up till then for safety reasons. We would like to thank the Government of France for its technical and financial support. A hearty bravo to Mr Pascal Royère and his team.

**7.** The veranda surrounding the ancient Bakong temple pagoda will be restored in the near future thanks to the perseverance and untiing efforts of Dr Vittorio Roveda who obtained private funding from Switzerland, represented in Cambodia by the HOLCIM firm.

**8.** The Royal Government has entrusted management of the Koh Ker site to the APSARA National Authority. After several visits by our different technical departments, we will soon be undertaking emergency maintenance work. Deputy Director General Mr Seung Kong has been assigned to oversee site presentation in order to encourage Angkor visitors to include a visit to this exceptional site on their travel agenda.
9. The town has not been overlooked either. Major urban development projects are on the drawing board to improve traffic circulation and enhance the beauty of Siem Reap town. Riverbank beautification operations will include putting in green spaces attractive to pedestrians, both locals and tourists.

10. The Angkor site protection zones will be strengthened in close cooperation with the provincial authorities in order to implement the community development program. This subject will be elaborated upon by speakers tomorrow and will include the bilateral cooperation arrangement between the APSARA National Authority and New Zealand.

11. Environmental protection will be ensured by enforcement of the ISO 14001 certification on the Angkor site, a subject that will be presented par HE Mr Tan Sambon.

12. Studies on hydraulic networks and the forest, in particular reforestation zones on the site, are priority matters being handled by the Department of Water and Forestry.

13. Tourism development requires urgent enactment of a policy to manage visitor flows and encourage visitors to stay longer. As of April 1, 2006, the APSARA National Authority has prohibited tourist vehicles with over 24 seats and heavy trucking vehicles from traveling travel through Angkor Thom.

The contract signed by the Royal Government with the South Korean firm ABC in September 1999 to introduce battery-powered shuttle vehicles for visitors to Angkor Park turned out to be inoperable due to social problems. The concession was turned over to the Chinese firm Yee Heer in 2005. After several months of trials in the field, the first vehicles were commissioned in early May.

14. A combination of tourist amenities will be included in various structures to be constructed in the Angkor Cultural and Tourist City. The buildings that will be used for the South Korea/Cambodia Cultural Exhibition scheduled to open on November 21, 2006 and run for a period of 50 days will be used as structures for tourist activities.

- Design work on the future visitor center has almost gone full circle. The design package is now being finalized and intake buildings and facilities are now undergoing architectural engineering studies. Work is expected to start in late June.
- The cornerstone laying ceremony for the Textile Museum has been announced by the Government of India and will take place in the near future. The necessary funding is in place, the bidding invitation procedure has been launched and the building will be delivered in a year’s time.
- Awarding the project to build the APSARA National Authority headquarters building is underway and construction will begin soon.
- The Sokha Hotels Company will honor its contract with the Royal Government by moving very soon on the building of new ticket sales booths in the Angkor Cultural and Tourist City. It also cared for the construction of a number of toilet facilities in Angkor Park.

15. I would also like to inform you that the Angkor site has been selected for the filming of a French television France 3 special ‘Des racines et des ailes’, a program with a highly cultural thrust.

In conclusion, on behalf of the APSARA National Authority, I would like to express my deep gratitude to the international community for its technical and financial support for the safeguarding and development of the Angkor site. I would like to thank specifically all the experts and technicians for the abiding friendship they have manifested for the Cambodian people. Thank you for your attention.”
II.2.2. Department of Monuments and Archaeology 1 (DMA-1) Activity Report, by HE Mr Ros Borath, Deputy Director General, APSARA National Authority

“My contribution will touch on the major work operations under the jurisdiction of DMA-1, which involve firstly archaeology, secondly restoration work sites, thirdly temple landscapes and approach areas, and finally problems relating to water. I will also mention the matter of personnel recruitment and the department’s organizational chart at the end of my presentation.

With regard to archaeology, DMA-1 undertook a number of survey operations, some of which involved further archaeological research on temple approach areas and archaeological rescue interventions.

At the present time, 27 archaeological diagnosis operations are underway on various temple approach areas. This work usually involves borings and taking core samples. Some of our work is done on the agricultural land surrounding temples, where we have to put in long trenches in an effort to add to our overall understanding of the site. These archaeological survey operations are done for the following reasons:

- Identify the archaeological potential. Once this is determined for a given zone, we can either
  o Declare it free of archaeological constraint; or
  o Classify it as a ‘risk zone’ needing specific protective measures or further archaeological intervention on a larger scale;
- Improve our historical insight.

As work continues on temple approach areas, rescue operations are continuing to develop on sites threatened by invasive projects. It is important to point out that an effective action can be carried out only if private and public builders comply with procedures. We have to improve ways of carrying out archaeological diagnosis.

The DMA-1 archaeology team is moving into planned research activities through its ‘work site schools’ approach in addition to its survey and rescue operations.

The Bat Chum restoration work site includes an archaeological excavation program that will continue on into 2007 in an effort to learn more about the site.

The Kok Patri site along National Road 6 west of Siem Reap town was threatened by the construction of a hotel in 2005. Protective measures were immediately taken by the APSARA Authority. The archaeological diagnostics program led to the discovery of two pre-Angkorian brick towers, a Buddhist terrace and a large quantity of archaeological material, including ceramics ware.

Due to the obvious interest of the site and its strategic position, a holistic project that includes a phased-in scientific excavation program was developed:

- Broad overview of the pre-Angkorian terraces and towers;
- Look for the eastern gopura;
- Get a reading of the central platform;
- Look for subsidiary structures.
Furthermore, a protective roof was put up and stabilization measures were taken in order to protect the open structures and display some of the archaeological remains. Explanatory panels will assist the visitor, outlining the work done by the APSARA Authority to showcase the Angkorian heritage and provide details on the scientific and archaeological survey work being done at Kok Patri. Some landscape structuring work will also be done that I will speak about later.

APSARA has its own ceramics laboratory since June 2005, with a triple objective:

- Inventory the archaeological material discovered by the various teams since 1992
- Process items found during archaeological survey operations conducted by the DMA-1 team
- Eventually have all of these items housed under the same roof

The archaeology laboratory was designed as a structure to accommodate various teams, each of which has a particular mission to carry out.

The Third Angkor Wat Workshop was held yesterday, Sunday, June 4, and featured the study of Angkorian ceramics and the potential of this study for further scientific research. It highlighted the need to develop a comprehensive catalog of the ceramic forms and systematically establish their relationship to the archaeological record. The suggestion was also made to establish a terminology appropriate to Angkorian ceramics, using Khmer terms, and expand ongoing studies in production workshops. The project for an archaeological material database proposed by the APSARA National Authority met with a positive response. Once this database is finalized, it will be submitted to the Plenary Session of the ICC in December 2006 for approval.

Regarding point number 2, restoration work sites, we are continuing our activities at Bat Chum, based on the same holistic, multidisciplinary and methodological approach. We are also going to focus our efforts on three other sites, Srah Srang, the Phimeanakas southeast terrace and southern gate of Angkor Thom.

At Bat Chum, after performing an architectural survey and recording the stones, we now are looking into dismantling the facing stones in order to do some foundation consolidation work.

We are making plans to restore the Srah Srang landing platform using the method outlined at the Second Angkor Wat Workshop. Some major problems were encountered: foundation subsidence, water infiltration and structural leaning. Emergency measures were therefore taken, that mainly involved getting the landing platform out of the water and propping up the structures.

The Phimeanakas southeast terrace is in a damaged state. We plan to put back up the fallen blocks and restore the various architectural elements.

Angkor Thom Gates: One of our teams is now working at the Angkor Conservation Office to identify the original tevoda and asura heads that once graced either side of the access road. I have seen snapshots of the concrete heads with their rusted reinforcement iron being circulated world over. As a preventive measure, the original heads had been replaced by copies back in 1992. Completion of this patient inventory work will see the famous gates of Angkor Thom restored to their original splendor.
As for landscapes, the DMA-1 is working on landscape presentation and structuring on temple perimeter areas in order to make the sites easier to understand and read. At Kok Patri, for instance, the idea is to make the temple and its topography readable again. The work to be done at various levels will highlight the moats and access road and enable better control of the water flow. At the present time, the various levels disappear under the yearly floods. Visitor access will be put in to the east, along with a small intake area to round things out.

This project fits in with the landscape guidelines map prepared by DMA-1 showing the different landscape work to be done in areas with points of interest involving the Angkor heritage.

This document containing general guidelines goes along with a work book containing detailed proposals for the concerned sectors. It amounts to a landscape management plan for Angkor Park. The future landscape unit of the APSARA Authority will be responsible for doing this work.

On point number 4, the temple approach areas, a traffic plan to regulate motor vehicle and tourist flows has been drawn up for the whole archaeological park. The network is set up around the temple approach areas and is designed to:

- Enable visitor access through the main historical entrance
- Showcase the temple approach
- Free up space between the visitor intake area and the temple

The purpose served by the temple approach area is to allow visitors to gather. It provides the basic services required for the temple tour. For this reason, it is important to clearly identify the real needs.

The surface area of the Angkor Wat approach area is approximately 273,000 m², divided into a 'no-build' zone with the green scenic protected zone and archaeological zones as well as a 'build' zone to contain various amenities. The 'no-build' zone is about 155,000 m² in area, while the 'build' zone, including parking lots, is about 117,000 m² in area, representing 43 percent of the total surface of the approach area.

DMA-1’s perimeter area management unit has prepared a proposal for a design study of the Angkor Wat approach area to allow some 10,000 m² of parking. The proposal will be submitted for advice and input to the other APSARA Authority departments. In thinking this out, we imagined the path that a visitor would take upon arriving at the approach area using the future access road in the southern axis of Phnom Bakheng:

- Once he gets off at the visitor center, the visitor will meet a series of structures or amenities in quick succession: information kiosk, checkroom, shaded areas or washroom facilities. As he goes through the visitor zone, he will then come to the western axis of Angkor Wat. He can either go into the temple or go on through the service zone to continue his tour of the archaeological park.
- Once he has finished touring Angkor Wat, emerging from the western causeway, or returns from visiting the archaeological park, the visitor will come upon spaces for food outlets and boutiques. The first one is near the parking lot, the second near the shuttle stop and the third outside of the Prasat Bai Kek archaeological zone.
Basic structures for the Angkor Wat approach area, including parking lots and the shuttle facility, are now being built. A number of things are needed to integrate the amenities and facilities into the archaeological environment and landscape:

- i) Continued archaeological diagnosis
- ii) Compliance with the approach area structuring plan
- iii) Application of the specifications and architectural recommendations developed by the APSARA Authority

DMA-1 is providing ongoing support and involvement in the key challenges of forest and water safeguarding. This has called for the development of a multidisciplinary project by DMA-1 focusing on the issue of water in both its archaeological and environmental dimension. The project includes research on the theme of ‘submerged sites’ to be carried out along a specific issue and the theme of water retention ponds in Angkor Park. Studies of the moats of the major temples such as Ta Prohm and Preah Khan are included.

In conclusion, let me say something about staff recruitments in the Department of Monuments and Archaeology. Since the June 2005 ICC meeting, we have recruited a total of 15 archaeologists, 7 architects, 3 administrative staff members, 2 employees for forestry management and a driver. We are thereby gradually reaching the necessary staff level to carry out our missions. These recruitments are accompanied by setting up in-house sessions within APSARA with assistance from the FSP institutional capacity building program. To keep the department running on a long-term basis, we need to develop a career path and organizational chart in order to stem staff departures that are already occurring. Thank you.”

Remark by Mr Azedine Beschaouch: “The latter point raised by our friend Mr Ros Borath is in response to a request the Secretariat forwarded to the APSARA Chairman, Deputy Prime Minister Sok An, to which he replied as follows: ‘Yes, we are aware of this problem. Kindly give us some proposals.’ In support of the most legitimate initiative taken by the Department of Monuments and Archaeology, the first proposal that the Secretariat has for you is to include this point among the recommendations. The Co-chairman for France will remember that we talked about this at the French Embassy, with the Secretariat, about bringing someone in from Paris who is experienced in handling these matters of career advancement in public institutions, to prevent what usually happens in the civil service. You can’t pay an architect the same as a civil servant. They’re being paid a civil servant’s wages now and as soon as they find an opportunity outside, sometimes with twice or three times the salary, as Mr Ros Borath said, they jump ship. It’s too bad. France has made an investment and some have taken advantage of the Japanese investment. They take courses, money is spent, training is given. Then they get additional training from the FSP only to end up in the private sector. That’s money out the window; it’s not wholesome management. So if our Co-chairmen will allow, we will make a recommendation on this point. Thank you.”

The French Co-chairman with the agreement of his Japanese counterpart approved the recommendation put forward by the Permanent Secretary and then gave the floor to Ms Mao Loâ.

Continuation of Activity Report, Department of Monuments and Archeology (DMA-1), by Ms Mao Loâ, Director of DMA-1

[OrigKh] “At our previous meeting of the ICC in November 2005, the activity report was presented by HE Mr Ros Borath, Deputy Director General in charge of the Department of Monuments and Archaeology.
It is an honor for me today to outline some additional work done since that time. As you know, ongoing upkeep and conservation operations are normally cared for by 9 working groups, with a division of responsibilities as follows:

1) Removal of plant growth on the temples and putting in props to support structures
2) Temple environment work
3) Temple upkeep
4) Temple conservation
5) Keeping the park clean
6) Archaeology and survey excavations
7) Cooperation with international agencies
8) Miscellaneous activities both inside and outside the Angkor zone
9) Future projects development

The area I care for has a total staff of 1,243 persons, 773 of which are men and 470 women.

Propping, upkeep work and vegetation removal were done on the Bakong temple. Cleaning work was done on the Phnom Bakheng temple and at the gates and enclosure wall of Angkor Thom. Weeds were pulled and scaffolding put up on various temples.

Secondly, work on temple perimeter areas. In the Angkor zone, we are doing follow-up studies and structuring work for battery-powered bicycle parking lots. We also helped select locations for a number of investment companies.

With regard to temple upkeep work, we put in propping on the northeastern side of Phnom Bakheng.

[slide] Here are props being put in on Banteay Samre temple and Khleang South temple.
[slide] Here is some of the propping work required on 20 locations at Beung Mealea temple.
[slide] Here is propping work being done on the Angkor Thom enclosure wall near Tonle Om gate.
[slide] 20 unsafe locations on Ta Som temple needed propping put in.
[slide] Propping work at Kraol Romeas temple on Phnom Kulen.

Work done by the temple conservation team. We opened 66 locations to visitors among 200 temples in Siem Reap province.

[slide] Here are activities being carried out by members of the guard staff preparing a walkway for tourists in the temple enclosure.
[slide] Preparation of a protected zone for ancient mounds near Vat Athvear temple.
[slide] Khmer technicians and helpers doing restoration work on the central tower at Preah Ko temple.
The Angkor Park cleanup team: It is made up of 252 persons, 50 men and 202 women. It cared for weeding work in the Bayon temple, Angkor Thom moats, Preah Ko temple and Ta Keo temple. We do upkeep work in Khleang temple and Tonle Om.

[slide] This is draft plan for the Angkor Park cleaning team.
[slide] Here are the activities of the archaeology excavation and survey group. Prior to refilling the Angkor Wat south pond with water, we have to study the layers of earth filling it.
[slide] These are survey excavations near an ancient bridge on the golf course in Puok district.
[slide] The third step of research excavations at Bat Chum temple.
[slide] Excavation work on the foundations of the Ta Prohm third enclosure.
[slide] For the project to put in a road linking the Angkor approach area and Route Comailles, we had to do an impact study and some survey excavations where some ancient mounds were found, there and at Kbal Damrei Lake.
[slide] Preventive excavation work, study of the layers of accumulated sediment in the Beung Mealea moats in preparation for refilling them with water.

International cooperation. This includes research work on ceramic ware from the Sorsei kilns in cooperation with the Nara Institute. Angkor Park has some 40 work sites run by 23 institutes originating from 19 different countries.

Study projects. These include the ancient road that linked Angkor to Pimai.
[slide] Study of the road is underway; rest areas along the Angkor-Pimai road; ancient bridge; ancient village along the road; rice paddies along the stretch of road being studied by the project.
[slide] This is a study involving the early structuring of Angkor Thom in cooperation with the EFEO project on Bakong temple and Tamuong temple. This will provide insight on the history of hospital construction by King Jayavarman VII.

Cooperation activities between the APSARA Authority and WMF:
[slide] First, consolidation of walls suffering from erosion on the north and southeast sides.
- Study of water drainage.
- Propping up towers on second tier. Landscape work and improvements to road to the south.
- Structuring a space for people to sit and enjoy the sunset at the top of Phnom Bakheng and putting in the trail to go up Phnom Bakheng while conservation work is going on.

Activities for missions both within and outside the Angkor zone:
[slide] Inspection work and consultation on the archeological impact of activities being carried out by investment companies and various institutions; studies of impact of road improvements in villages and communes in the Angkor zone.
- Visit to sites located in Zones I and II and for which applications for putting up new homes have been received.
- There are many other activities with national and international institutions that have not yet been described.
This is an archeological impact study on sites that were granted to investors present in the Angkor zone. This is an inspection of an old house being moved and a new house being put up in its place in Kok Duong village, Teuk Vil commune, Puok district. DMA-1 is associated with some archeological excavations being carried out jointly at Bore Provat, Thailand. This is also true of some archeological excavations in India.

Among future restoration projects, the DMA-1 is working on restoration of the tevoda and asura heads at the Angkor Thom northern gate, also known as Tonle Om. DMA-1 is currently studying the heads in storage at the Angkor Conservation Office. We also have plans to structure the Phnom Bakheng approach area. We have a preventive excavation project on the site where a fuel depot for the Siem Reap / Angkor International Airport is slated to be built. We are preparing to rehabilitate the Angkor Thom moats and the Angkor Wat south pond. We are also preparing to rehabilitate the Banteay Srei and Ta Prohm temple moats. Plans also call for removal of sediment at Preah Khan, Banteay Kdei and Srah Srang.

This is a risk map for the Koh Ker temple complex. Two areas in danger of collapse were identified in Neang Khmao temple, one area in Srot temple and ten others in Prasat Thom. Here is the risk map for the Eastern Mebon temple and Leak Neang temple. Thank you for your attention.”

II.2.3. Report on ISO 14001 Certification for the APSARA Authority, by HE Mr Tan Sambon, Deputy Director General, APSARA National Authority

“Since it was established in 1995, the APSARA Authority has had as its key mission the protection, conservation and presentation of the Angkor archeological site. It has consistently promoted a policy balancing tourism development and site preservation, one that is environmentally friendly and takes the welfare of the communities into account.

As time went on, this policy proved to be inadequate in a context in which tourism development is on a strong growth curve. This is a matter of concern on the Angkor site, given the sharp rise in tourist numbers from year to year. For observers in tune with the problem of environmental protection, the Angkor site on mankind’s World Heritage List is at risk due to expanding tourism, road and hotel construction and the generation of solid and liquid waste.

Given this alarming situation, the APSARA Authority is convinced that action is needed to resolve the problem of ecological degradation on the Angkor site. For this reason, a memorandum of understanding for a three-year term was signed on May 23, 2003 between the APSARA Authority and a consortium of four Japanese agencies, Sophia University, Japan Quality Assurance (JQA), International Standard Research Institute (ISRI) and Japan Quality Assurance Institute (JQAI), to set up an environmental management system for the Angkor site compliant with the ISO 14001 standard.

The objectives set for this APSARA Authority environmental management project are:
- Preserve the environment of the Angkor site for future generations by minimizing the negative impacts of runaway tourism growth;
- Improve the standard of living of the communities living on the Angkor site;
- Provide an environment education model for Cambodia.
The methodology used for such a system is the P-D-C-A cycle (Plan – Do – Check – Act). It is a process involving four successive phases and the cyclical kicking in of these four phases leads to continued improvement of the environmental management system.

Prior to applying this methodology, we carried out a first preliminary step with the following activities:
- Pre-service training in the ISO 14001 standard environmental management system;
- Setting up an organizational structure dedicated to functional organization within the APSARA Authority;
- Diagnosis of the initial environmental situation on the Angkor site in cooperation with the Ministry of Environment, including a water and air quality analysis;
- Framing the APSARA Authority’s environmental policy.

Step two involved the orderly phasing in of the P-D-C-A cycle.

Phase P, Plan, includes planning activities for the purpose of identifying the environmental aspects of each of the APSARA Authority’s departments, identifying and monitoring the legal requirements governing environmental protection, establishing the environmental goals and targets and developing the environmental programs necessary to reach them.

Phase D, Do, refers to getting the environmental management system up and running, based on the following activities: assignment of roles and duties and making appropriate resources available; training APSARA Authority staff; developing and updating documentation; establishing outside and inside communication; ensuring response to emergency situations.

Phase C, Check, involves an audit or assessment of the environmental management system, in other words supervise, measure and assess compliance with the ISO 14001 requirements, identify and implement corrective and preventive action and conduct internal audits.

Phase A, Act, refers to reviewing and improving the environmental management system, which involves looking at the way things are going and identifying areas requiring improvement.

Step 3 involves submitting the APSARA Authority’s environmental management system for ISO 14 001 certification by an agency specializing in auditing such a system. JQA was selected, and it conducted a number of audits in the APSARA Authority’s Siem Reap departments and certified that the system had been audited and found compliant with the ISO 14 001 requirements.

Implementation of this management system enables:
- Ongoing improvements to enhance our environmental performance
- Cutting back on negative environmental impacts
- Staff motivation due to a specific delineation of responsibilities
- The APSARA Authority enjoys a good image in terms of the environment

Thank you for your attention.”
II.2.4. Report on Safeguarding Koh Ker, by HE Mr Seung Kong, Deputy Director General, APSARA National Authority

"Koh Ker temple is in Preah Vihear province, 130 kilometers northeast of Siem Reap town. The road to it has been hard-surfaced two thirds of the way and you can drive it in just over two hours. The APSARA National Authority took over management of the Koh Ker site as of July 17, 2005 from the Ministry of Culture and Fine Arts. Because it was so remote and hard to get to, it could only be administered fully from January 2006 on. The Koh Ker complex has about 50 temples, but the APSARA National Authority is managing only 33 of them in a 36 square kilometer area determined by Royal Decree.

The Koh Ker protected park perimeter area includes one village of 54 houses and 270 inhabitants located 700 meters north of Prasat Thom. The other villages are several kilometers away and therefore outside of the protected zone.

The APSARA National Authority undertook the following immediate emergency measures:
- Hire full-time staff to guard and check the site
- Mark off the protected zone boundaries
- Brief the local authorities and raise awareness in the local community regarding the cultural importance of the site so as to involve them in site protection
- Clean-up and beautification operations
- Put in amenities to facilitate tours of the site
- Select experts and technicians

1. Guards: Fifty guards under the direction of a chief guard are present on the site. Their first task is to supervise and clean the temples to make things safe and enable tourists to access them easily. This started with Prasat Thom, or the pyramid. With the stairway, enclosure and main temple cleared, the site is more appealing to tourists.

The guards still lack experience in the field of temple protection and conservation. It is therefore not yet possible to get them involved in restoration work.

The next step involves getting preliminary expert studies done. Although the temples of the Koh Ker site are generally in an unsafe state, there is no immediate threat of collapse. Scaffolding has been erected and ‘no entry’ barriers have been put up in areas that are very unsafe.

2. Marking off the protected zone boundaries: It is urgent to mark off the protected zones around the site. We learned from hard experience in land appropriation in Angkor Park that there must be no delay in marking off the boundaries of the protected areas. To avoid problems along these lines, this is a priority activity for Koh Ker. Only the roads leading to the monuments have marker posts, while the boundaries going through the woods have not yet been put in because of potential landmines. CMAC is checking this out and has already demined a strip 20 meters wide and 6 kilometers long out of a total of 24 km.

3. Communication and awareness raising: In addition to priority temple safeguarding operations, the guards are being trained and educated daily in ways to help them be aware of what to do in archeological temples and how to go about it, based on the principle that ‘cultural wealth is community property and all have the responsibility to preserve and protect it’. Meanwhile, the local authorities, local people, monks and school children have also been invited to awareness-raising sessions highlighting the need to safeguard and showcase the temples in the common interest.
4. **Role of the concession holder and tourism structuring work:** Based on the existing contract, the concession holder is to put in access roads to the different temples. Currently, tourists can visit about 20 temples using different means of transportation.

Structuring work on the two ponds along the main entrance to Prasat Thom has gotten underway. One of them has already been rehabilitated, while the other will be completed shortly. Cleaning off the outer enclosures of each temple to a width of 20 to 30 meters has already been completed, and the APSARA National Authority is continuing this work. Toilets are being put up on locations selected by the APSARA National Authority.

5. **Tourist numbers:** Since late February 2006, once the road was upgraded and news got out, national and international tourists have started coming in increasing numbers to the Koh Ker site. On the average 50 to 60 foreign tourists visit the site each week, along with about 20 to 30 national tourists. On holidays, such as the Khmer New Year, a record total of 5,745 foreign and national tourists visited Koh Ker.

6. **Future operations:** Monument maintenance experts must be selected and a maintenance team formed for monument upkeep and propping work and to clean the temples inside and out. A team of carpenters has to be set up to salvage the wood from fallen trees and cut down trees that are a threat to the safety of the site.

The APSARA Authority is encountering some difficulties in its work. It has been hard to find workers suited to our needs. The villagers live very far away, up to 10 kilometers, and have no way of traveling to Koh Ker. There are very few people living close to the site. They are farmers who work their rice fields or eke a living from the forest and are therefore unable to follow routine hours of work. Despite this, every effort is being made to resolve the problem of human resources and temple safeguarding so that the Koh Ker site will be successfully developed.

I would like to invite all of you ladies and gentlemen and my fellow countrymen here present and those who have experience in the matter, if you haven’t already had the opportunity of visiting Koh Ker, by all means come and see this green site and share with us your recommendations to improve our work.”

**Remark by Mr Azedine Beschaouch:** “In keeping with the procedure, I would like to make a recommendation. I would like to point out that the Royal Government decided this year, with national heritage safeguarding in mind, to expand the jurisdiction of the APSARA Authority to include Koh Ker. We are happy about that because it is a very important site, as you have just seen, one that provides further insight into Angkorian archaeology. As Permanent Secretary, I was asked to attend a meeting and it was with deep satisfaction that I learned that various APSARA Authority departments, in particular the Department of Monuments and Archaeology DMA-1 and the Tourism Development Department, have agreed to help Mr Seung Kong who is in charge of this undertaking. So APSARA is geared to take care of safeguarding.

The recommendation would be as follows, if our Co-Chairmen agree, and we will submit it in writing later: First, since it now comes within the ‘jurisdiction’ of Angkor, that the *ad hoc* group of experts, assisted by the Secretariat and the APSARA National Authority, make a site visit in the near future, see the actual situation and submit an assessment report. Second, I have spoken about this to some our colleagues and learned that a number of them have already taken time for a pleasure outing or an exploratory trip to these ‘remote’ Angkor places. Some of them have taken pictures dating back seven or more years. Back then, things were in better condition than they are today. Unfortunately the site has suffered to some extent. So the recommendation would be that any member of our Committee who has documents to pass a duplicate of them on to APSARA, to Mr Seung Kong in particular, the man in charge. This would be a contribution to safeguarding this important site. Thank you.”
The French Co-chairman, with the agreement of his Japanese counterpart, approved the recommendation put forward by the Permanent Secretary and turned the floor over to the Ambassador of Canada.

II.2.5. Statement by HE Madam Donica Pottie, Ambassador of Canada, Thanking the APSARA National Authority for Making an Alternative Land Allotment Available for the Cambodia Landmines Museum

[OrigE] “At last year’s meeting, as you may recall, the Cambodian Land Mines Museum Relief Fund gave a presentation to all of you on a project to develop, with a Cambodian named Aki Ra, a landmines museum and victims’ assistance center in Siem Reap.

In 2004, the NGO had raised the funds and purchased a plot of land here. Unfortunately, the land was in Zone 2 and it was not therefore possible for the museum to be built on the land originally purchased. At last year’s Technical Committee meeting, members endorsed the project in principle and recommended ‘that the Royal Government make an alternative land allotment available’.

Well, I am delighted to inform you today that that’s exactly what happened. In May 2006, through the good offices and diligence of the APSARA Authority, a land swap was completed, trading the land in Zone 2 for a piece of land in Zone 3. The new site of the landmines museum and victims’ assistance center is in a village in Zone 3 on the main road to Banteay Srei. It is a highly visible site which will attract those tourists who are interested in Cambodia’s recent past. It will also provide a safe environment for the young victims of landmines.

I would like to extend my thanks to this Committee for its support in this project and also to indicate my deep gratitude to HE Sok An, Deputy Prime Minister and HE Bun Narith, Director General of the APSARA Authority.”

II.3. Conservation: Activity Reports from International Teams on the Site

II.3.1. Safeguarding Angkor Wat Temple, West Gopura Entrance, West Bakan Pavilion, Southern Gallery (Western Section), Western Angkor Wat Embankment (Northern Section, West Steps), by Mr Valter Maria Santoro, Director, Ingegneria Geotecnica e Strutturale, Italy

[OrigE] “It is my pleasure to present the new project funded by Italian Funds-in-Trust regarding the site of Angkor Wat. In 2004, the Italian Government asked the APSARA Authority to submit a technical proposal for a project of safeguarding of the site of Angkor Wat based on two requirements. First of all, to use the Italian expertise and make sure that the Italian activities will remain in the Angkor site during a long period of time. Secondly, to place this site for the next project in the Angkor Wat vicinity in order to give maximum visibility to the Italian efforts to help the country of Cambodia and the APSARA Authority to safeguard the wonderful site of Angkor Wat.

Based on these items, four sites were chosen in order to exploit the expertise made available by the Italian team, regarding problems related to hydraulic engineering, geotechnical engineering, problems of interaction between the foundations of the damaged structures and the structural problems.

Some sites were chosen, including the embankment of the west moat, the southern gallery, west half, which is in very bad condition of stability, and the west gopura entrance and the West Bakan. In detail, we can see the location of the parts of the temple that are concerned
by this project. First of all, the west moat, north part, and the west stairs which are in a very damaged condition. You can see how the soil has flushed down during the centuries without maintenance and before collapse of the soil and of the staircase. The project provides a topographical survey of the staircase and of the background table, detecting buried blocks of the staircase, investigating the mechanical properties of the backfill soil.

Our research has been promoted within the framework of this project with a topographical detailed survey, based also on a 3D laser scan survey with a geo-electrical resistivity and conductivity survey in order to detect the presence of buried blocks and to make a seismic survey in order to analyze the local geo-technical conditions. So a program of our research in order to assess the real causes of the phenomenon will be carried out in the project.

The solutions of restoration of the embankment will be based on the experience that the Italian team has acquired in the south half of the west moat between 2002 and 2004 when reconstruction of the west staircase was performed thanks to the contribution of UNESCO’s World Heritage Fund and of the APSARA Authority. The restorations are based on the use of new technology such as geotextile in order to guarantee the reinforcement of the soils in good drainage conditions.

For the Angkor Wat west gopura, this is the second part. The restoration of balustrades is provided as well as strengthening the columns, reinforcing the architraves and vaults. This is a general view of this part of the temple which presents lacunae and missing parts, with blocks and scattered stones all around the site. A documentation work is provided in order to detect the proper blocks and pieces of stone to be replaced on site. Decay of the materials and damage on the structures require very urgent measures in order to make conditions safer for the access of tourists.

For the West Bakan pavilion, on which emergency measures were taken seven years ago: investigations on the retaining walls on the mountain temple structure; reinforcing of the retaining structures; strengthening the columns and vaults; refixing loose blocks; drainage throughout the foundation core constituting the West Bakan; drainage of ponding water and removal of propping that was put in seven years ago on the site by the APSARA Authority.

Even in this part, there are several phenomena of decay and structural damage due the overall behavior of the massive staircase due to the unbalanced water pressure on the stone blocks that cause collapses and scattered blocks all over the site. We are managing to make the same proposal we have carried out on the site of Pre Rup temple where the retaining wall of the terraces was restored. This is the situation before the work. This is the same wall after the work where retaining structures and support measures were made with technology based on fibers, bars and rod. Also, hydraulic problems in West Bakan shall be phased out in order to guarantee good drainage conditions. Finally, the removal of propping is also provided.

For the southern gallery of Angkor Wat, the west half, it is the most endangered part of the gallery. A monitoring system has already been put in thanks to funds from the APSARA National Authority, moving the monitoring system from Pre Rup after intervention to this part of gallery. A geotechnical investigation will be made, as well as foundation pit tests, analysis and proposals for emergency measures. This is the location of the gallery. Everybody is no doubt familiar with this very endangered part of gallery with several problems: heavy deformations, cracks and situations of collapse. You can see how the joints are opened and the tilting out of this very complex structure portion. This is the settlement that can be measured and this is the first damaged part we have surveyed before starting the project. This is the monitoring system we have placed on site and these are the main results we have collected after two years of monitoring. We can see the evolution of the opening of the joints due to temperature and hydraulic conditions. If we compare the water table level with the opening of the joints, we can conclude unfortunately that this is not a problem of subsidence but it is due to the backup of water pressure on the lower retaining wall of the gallery, which means that more than a deformation, this is a problem of the stability of the overall structure.”
II.3.2. Report from GACP Angkor and Proposals for Future Development of GACP’s Involvement in Safeguarding Angkor, by Professor Hans Leisen, Director of GACP, Germany

The main work of the GACP conservation team consisted in the conservation and maintenance of the carved surfaces at Angkor Wat. This includes the conservation of endangered areas of the galleries of bas-reliefs in the third enclosure, pediments and friezes on various gopuras and towers, the conclusion of the conservation of the Southwest Pavilion of the third enclosure, the planning and implementation of the de-restoration and conservation program for the Northwest Pavilion of the third enclosure.

Emergency consolidation and conservation has been carried out on several temples and objects elsewhere in Angkor Park as well. Research activities on various stone varieties in Angkor as well as studies of the microbiological contamination, the deterioration potential and tests of biocide treatments have been continued.

Following the map of priorities, new work sites were set up at the northeastern corner pavilion after the conclusion of the conservation work on the central east gopura of the third enclosure in March 2006. Six pediments, two of them are nearly lost, are all in a very bad shape and all have to be treated.

Some of the frontons above the doorways of the first enclosure of Angkor Wat, like much of the carved areas of the temple, are in a poor state of preservation and until now have not been subject to monitoring or intervention mainly due to their inaccessibility. Scaffolding was erected on the northeast corner of AV 1 and testing and monitoring was carried out to assess the levels of decay and the feasibility of working on these difficult and inaccessible parts of the temple. A program was established to investigate all pediments on the corner towers on this level. These are now the eastern towers and you get an impression of the state of preservation of the bas-reliefs on them. In March 2006, the work on this pediment was started by some of our students from Cologne.

This is normal work being carried out in the galleries and on the apsaras. Activities involving the conservation of carved surfaces in the Southwest Pavilion of the third enclosure were concluded in August 2005 on decayed surfaces inside the Southwest Pavilion. The work was presented during the ICC Plenary Session site visit in November 2005 and was published in the last edition of Udaya for 2005.

Similar to the Southwest Pavilion of the third enclosure, the reliefs in the Northwest Pavilion had been treated during a former intervention. The preparation of the de-restoration and conservation process started in 2005. In February 2006 the intervention started with the removal of the cement joints and washes and a desalination process. Actually the removal of acrylic resin is in progress on several walls. The pavilion is now closed to visitors, therefore stairs have been built by APSARA for access to the bas-reliefs from the northwest entrance.

This was presented during the last ICC meeting in November as well: the evaluation of the sculptures in Angkor Wat. Some small repairs on smaller fragments have been carried out as well in order to prevent the loss of these fragments. The inventory will continue in summer 2006 and we hope that we can finish with a preliminary inventory in early 2007.

The GACP now responds more and more frequently to the requests of the APSARA Authority for the treatment of specific stone conservation problems in Angkor Park. The staff members of the GACP have now worked and are continuing to work on a number of other sites where serious stone conservation problems have been identified. This is part of the operation of standardization of materials and procedures that we heard about earlier from Professor Croci, something that is essential on a site of the dimensions of Angkor.
At the Angkor Thom south gate, we repaired a statue of one of the giants that had been toppled off after an accident with a little truck.

Further visits and surveys have been made by experts in the field of architectural conservation and stone conservation to the Phnom Bok lingam. Measurements of the altar foundation have been carried out as well as an ultrasound tomography of the lingam with the aim to detect cracks and to determine the extent and depth of the cracks. During the last visit in February 2006 an increase of damages especially on the top of the lingam affected by contour scaling has been observed. The planning of the intervention is in progress. As the stone material of this unique piece varies significantly from that of the stones on the temple walls, the conservation materials used by GACP have to be modified and adapted to the requirements of this specific material.

During earlier visits to Koh Ker temple the GACP, together with APSRA staff, discovered wall paintings in the central shrine on both the south and the north walls. In March 2006 a photographic documentation of the walls was prepared. In April 2006 three students from Germany and Khmer team members carried out the mapping and documentation of the paintings. These documents and observations are the basis for planning further investigations and formulating recommendations.

During his research into Cambodian murals, Dr Vittorio Roveda visited the 20th-century Wat Bakong and found the wall paintings on the veranda in a very poor condition. A thorough investigation into the state of preservation of the pagoda by the GACP team revealed that a combination of poor quality building materials and building techniques were responsible for the deterioration. The worst affected wall painting was the apron 10. Indeed, fragments of the wall painting had already become disconnected from their supporting structure and were recovered from the floor by Dr Roveda. It was considered a priority to detach this apron before its possible collapse and the GACP carried out a detachment project in July-August 2005.

A student from Cologne specializing in the conservation of wall paintings consolidated the parts of the detached apron and the pieces are now temporarily stored under safe conditions in the GACP office. They can be reapplied at a later time. All the paintings have been mapped in detail. The risk map shows that several paintings are in imminent danger of loss. Therefore emergency consolidation was applied on several aprons with reversible constructions. GACP is now analyzing the wall painting materials, both the mortars of the aprons, the supporting construction and the painting materials. Then methods for the consolidation of the paintings will be developed.

The studies on the stone materials in Angkor, such as the petrography and physical and mechanical properties have been continued and summarized by a comprehensive research operation in cooperation with the Institute of Geology of the University of Cologne. There are a lot of data now available on the composition of different materials and the compiled data with be the basis for the definition of requirements for conservation interventions and the application modifications and tailoring of the conservation materials used by GACP for the specific temples.

The studies on the effects of the biology on the various types of sandstone and the effectiveness of cleaning procedures with biocides and durability of biocide treatments at Angkor Wat have been continued with excellent results in our view. You can see the early test area on one of the libraries from 1997. This area is still in good condition and we applied it last year on a bigger area on a roof. It is only sprayed on, there is no mechanical cleaning. After one year, the biology is washed off by water.

The foregoing outlines our program, which will keep us busy at least until the end of this year.”

The French Co-chairman thanked Professor Hans Leisen for his contribution. Before giving the floor to Mr Pascal Royère, he briefly introduced the French Priority Solidarity Fund on the...
theme ‘Angkor Heritage and Sustainable Development’ and its three components: completion of work on the Baphuon; institutional capacity building, human resources development and training; enhancement of the National Museum in Phnom Penh.

II.3.3. Point of Information on the Baphuon Restoration Work Site: EFEO-FSP, by Mr Pascal Royère, France

“All of us here are familiar with the background of the Baphuon restoration project, its problems, the methodology that was developed to find a solution to the stop-and-go programs. I won’t rehash those aspects but simply focus on the work that was done over the last year.

Firstly, I will cover the restored structures that now give a rather spectacular look to the work that we have done, starting with the eastern gopura on the second tier. [slide] This is the condition the gopura was in by the late 1950s, when it was dismantled. The structure had suffered from a number of spontaneous collapses, although also related to sections of the third tier that had fallen down onto the base of this edifice. You can see the antechamber and tower with false tiers that crowned the complex, as well as the dismantling work that was started in the late 1950s and that was completed for this pavilion by the mid-60s, and finally the result today with the pavilion still covered with scaffolding, then what it looks like now with that structure removed.

[slide] This view shows one of the problems that we were confronted with, that of sandstone pieces inserted into the ancient structures. On the three levels of false tiers, we put in these insertions for the sole purpose here at least of dealing with structure problems. There is no attempt to complete things for esthetics, to make the building look better.

[slide] Now with this pavilion restored like the other pavilions I will mention later, we can now have access to the bas-reliefs on the second tier of the monuments. These bas-reliefs are quite unique compared to those found in later periods, such as those of Angkor Wat and the Bayon.

[slide] The northern gopura is still being worked on. We just finished the southern gopura, under the same tier, using exactly the same operations. The southern gopura suffered much less by way of collapses, so we did not have to insert sandstone to get all the false tiers back up. The gopuras on the second tier of the Baphuon are, just as the towers on the Angkor Wat central block, the only Angkorian prasats that still have their crowning decorations.

While this restoration work is going on, we are continuing to consolidate things. This was true of the last dry season campaign, during which we worked on the southern face of the third tier in the eastern quarter. [slide] All of this section was consolidated. Here are a few pictures of the method that was used. We plan to do similar work on the western face, doing the same thing, putting in a reinforced retention device to alleviate pressure from the inner fill.

This appears to be a small building, not much in comparison to the Baphuon, but one that is very important. On the west side we were able to restore only one of the four original gates allowing access to the pyramid. It is very small compared to the main gate on the east side. All we could find was the foundation, but we were able to put it back together by analyzing the stones on the storage field and putting the puzzle together.

As HE Mr Bun Narith mentioned in his statement, a little less than a month ago we opened a small pavilion which was partially rebuilt. It is part of a gradual process allowing tourists access to the temple. Before, you could only take a walk around the temple. Although that pathway is still there, you can now get up to the first tier of the temple to see the work that has been done and get information about the purpose of the restoration project.
Here are some details of the work we did: a platform of about 200 square meters, a pavilion of about 50 square meters that contains panels and posters explaining the objectives of the ongoing project. For security reasons, this access is only open when work is being done on the site. Some people are disappointed, but it is simply because it is a work site. We have equipment standing on it and we have to keep an eye on it. So after working hours the site is closed to visitors.

Opening this pavilion is an attempt to readjust history because back in 1995 when we resumed restoration work on the Baphuon, tour guides often told the rare visitors who made it to Angkor that this was the temple that the French took down. It was a little upsetting at the time to hear people say that, but now we just grin. True enough, the French had taken it down, but modern history had forced them to delay putting it back up.

This picture goes back to January 1995, showing the state of the monument one month after the program was resumed and inaugurated by King Sihanouk. In 2002, we had analyzed about 70 percent of the stones out on the storage fields. We were able to recreate in virtual 3D various possibilities for reassembly and here you have the current state of the work done.

DISCUSSION

Remark by the Japanese Ambassador: “I have one question for HE Bun Narith about his presentation, regarding the introduction of electric cars. In particular, my question relates to the procedure followed for selecting the company. Was international competitive bidding followed? I raise this question because by the nature of this new system, certain transportation activity would be prohibited and instead some exclusive rights would be given to a specific company. So if the competitive bidding system is not following, then I would like to know what the APSARA Authority’s procurement policy is, because similar things might happen in other fields of economic activity related to the archaeological park. Also, will the contract be reviewed at the end of this period or not?”

Response from HE Mr Bun Narith: “In my report, I pointed out that the old concession contract for the electric shuttles was signed in October 1999. But after that contract was signed, there was a lot of community opposition, especially from people who were running transportation services in the park. That contract was set aside until further studies could be done. Around 2005, we used the same contract but with a few changes limiting the fees allowed in the old contract because exclusive rights were stipulated in the old contract, limited essentially by one sentence, one article, that says for any operation, the electric shuttles must be approved by the APSARA Authority. In the current state of things, the trial transportation, no one is being forced to take the electric shuttles. The price is based on the market price.

Right now, we are authorizing various forms of transportation such as taxis, minibuses with less than 24 seats and other means that are in arm’s length competition. During the three-month trial period, the electric shuttles are offered at a price even lower than what is charged by the other means of transportation. But I observed that in the last month, very few visitors are opting for this form of transportation. In other words, we will go through a test period, make an evaluation and then ask for final approval.”

Remark by Mr Azedine Beschaouch: “With regard to these means of transportation, as you know, your Secretariat is also a sounding board, because people come and tell us things. There are two important points: The APSARA Director General just said something significant. A decision can only be made after a test. That is reassuring. I say so because some groups have already complained, feeling that they would be forced to use that system of transportation. They claimed that when they got there, in a group of 30 or 40, there was no way they could be broken up. Here in Asia, how can we take one group and put part of the family or group of friends in one shuttle and the rest in another? They’re here because they like to be together, such as on the
same bus. Somebody told me yesterday, ‘Why not use busses or train cars? Several world heritage sites have electric trains, so why make us use that?’ I told him that it was not yet mandatory. I was glad he spoke his mind. I promised him I would pass on his comment. I’m doing so now.

The second remark refers to a point mentioned by the Director General, and some of us were wondering about the same thing: What’s going to happen to the ‘morks’ and the ‘tuk-tuks’, the bicycles, motorcycles, etc.?

So I think our Co-chairmen may agree to have a recommendation to help the APSARA Authority come to a decision based on actual facts, surveys of the various tourist groups. The APSARA Authority has a Public Observatory. It’s there to be used. Most importantly, we need to have a specific survey taken to find out from group travelers such as the Japanese and Koreans, if they feel the system is workable. Based on an overall report and analysis, the Government will be in a position to make a decision.

That is my proposal. If you agree, we could write up this recommendation to help the APSARA Authority and we will avoid the situation where people start complaining to us that they are being forced to use something that they do not find suitable.”

Remark by the French Co-chairman: “In reply to the question raised by the Japanese Co-chairman, we understand that we will have an analysis of the results of this trial run and that two surveys will be conducted: one survey will look at the situation of light means of transportation and one survey will look into tourism consumer satisfaction.”

Remark by Mr Azedine Beschaouch: “Or consumer dissatisfaction, because it is possible if not probable that some tourists will never agree. But we will, if you agree, recommend that a survey be taken. The Public Observatory does excellent work and I think that we will have a specific survey and the results will be presented at our next ICC meeting.

With your permission, may I leave this and move on to another point? A few minutes ago, Professor Hans Leisen outlined a remarkable series of operations, and the Secretariat is most happy to congratulate him, doing so on behalf of the ad hoc experts and all of you. He showed us the modern pagoda of Bakong with its paintings that are most interesting. I say that because at the request of the Chairman of the APSARA Authority, HE Deputy Prime Minister Sok An, I recently went to visit it with the Director General of the APSARA Authority. Mr Roveda was with us too, and he deserves a pat on the back because he drew attention to it and was able to get funding from a private group. The funding is now in place and work can begin.

What I would like to recommend is first that Professor Hans Leisen and his team, if they are going to continue, that they work together with the APSARA Authority. Mr Roveda strongly feels that the work should not be a private initiative, but rather an APSARA National Authority program in cooperation with the German team. That is the point I want to make, because if not, we could get the impression that this is being done on the sidelines, whereas we are right on the Angkor site and the ICC is a stakeholder in this undertaking. So my recommendation to our Co-chairmen is that Professor Hans Leisen respond immediately or we make a recommendation and a study will be undertaken with APSARA.”

Response from Mr Hans Leisen: “[OrigE] “Of course, we will continue with the work, one of the students is doing her practicum on the advance studies. But up to now, all the work we did was in close cooperation with APSARA. We had several consultations at the site and everything was confirmed by APSARA up to now and this should be done also in the future.”

Question raised by Azedine Beschaouch: “I would like to invite my colleague and friend Mr Pascal Royère to make a public statement because we have been asked, when or about what time will the Baphuon be officially opened?”
Response from Mr Dominique Dordain: “That’s hard to say. Pascal Royère and maybe Michel Verrot will give an answer. The project itself has a deadline, but as you know, things can come up that make it impossible to meet a specific deadline. At any rate, the project has a three-year time frame starting in 2006. Pascal Royère and Michel Verrot will give more details.”

Response from Mr Pascal Royère: “The deadline has been set for December 2008 and we will of course do everything we can to meet it.”

Remark by Mr Azedine Beschaouch: “This week someone asked if the soft opening would only be short-term. I said no, this opening enables the visitor at this stage, as Mr Royère showed, to admire all the rich decoration of this great architectural structure that has now been about two thirds restored. I would also like to remind everyone, because part of our job is being the memory, that when His Majesty the King-Father NORODOM Sihanouk opened the work site with then French Ambassador HE Gilles Le Lidec, He asked when it might be opened. He cautiously replied to His Majesty ‘2006 or 2007’. One year later isn’t bad and my experience in this trade is such that I would say if it was late 2008 or early 2009, it wouldn’t be bad. The reason I raised the question is to reassure everyone. We’re dealing with a truly great monument and it’s not a job you can do in a few months. It takes years.”

Remark by Mr Dominique Dordain: “I think that the conditions for opening this pavilion were studied out in close cooperation with the APSARA Authority so that both the technical requirements of the work site as well as safe access for tourists were taken into consideration. This morning I alluded to a step-by-step restoration and here we have the first step. Others will follow. Michel Verrot also has something to add.”

Remark by Mr Michel Verrot: “We are already starting to stretch the time. The FSP project started on September 19, 2005 and it is a four-year project. So we are already a few months ahead of the December 2008 date.”

Remark by HE Uk Someth: “I would like to go back to an earlier subject. I didn’t quite catch the problem with the electric vehicles. It seems to me that the major issue in introducing these shuttles is pollution. Nobody said a word about pollution and tourist satisfaction. Are they two compatible or incompatible and what is the main reason? Are we to protect the temples from pollution? Or satisfy the tourists while allowing the temples to be polluted?”

Remark by the French Co-chairman: “We are sometimes confronted with contradictory constraints, but we have to think in terms of safety, tourist satisfaction as well as pollution problems, of course. I think that all of these constraints will be considered when the matter is analyzed.”

Remark by Mr Pierre-André Lablaude: “I think that before we go any further in this debate on electric shuttles, with regard to pollution, the first thing to do is to instrument, monitor, measure and diagnose rather than having a theoretical debate on ‘polluting’ and ‘non-polluting’. What is the extent of the risk? Is it growing? And when you have determined that, then you can come to an informed decision based on facts that have been checked out and proven.”

Remark by Dr. Valter Maria Santoro: “Just to complete my speech about the structural problems of the Gallery of Angkor Wat, I would like to point out that my interpretation of the damage of the gallery is based on a monitoring system. This is could be a very good chance to stimulate discussion between the different experts, the different teams such as the World Monuments Fund who studied this part of the gallery and other parts of the gallery for such a long time. The APSARA Authority has made a very accurate study on the structural pattern of this double vault gallery. I presented this pattern that I discussed before at the international conference last September on soil mechanics and geotechnical engineering in Osaka, with a technical committee led by Professor Iwasaki of JASA. This is a quite personal interpretation that could be the basis for a discussion of a complex structure behavior and geotechnical behavior that I would like to discuss together with different teams and experts in the Angkor area.”
II.3.4. Safeguarding the Bayon: JASA (Japan-Cambodia) Project

Presentation by HE Mr Ros Borath, JASA Project Co-director

“A first step has been made in the partnership at Angkor. JASA actually involves three parties: UNESCO, the Japanese experts and specialists, the Khmer experts, technicians and helpers trained by JSA during the previous phases and the APSARA National Authority. This new step, phase 3 of the Bayon, is being led by two Co-directors, Professor Takeshi Nakagawa and yours truly.

This project came into being in July 2004 in response to the need to restore three sections of the Bayon temple in Angkor Thom: the southern library of the Bayon, the bas-reliefs on the inner and outer galleries of the temple and the central tower. It is a five-year project running from 2005 to 2010. It has the following objectives: monitoring and controlling deterioration in the temple; carrying out conservation work in identified zones of the temple; recording all data that has to be kept for current and future work; training Cambodian specialists and technicians in conservation and restoration methods for the Angkor monuments; dissemination of information on the activities as well as the scientific findings made by the project both nationally and internationally.

This new project was drawn up based on the Master Plan for the Conservation and Restoration of the Bayon Complex. All work will be done with the approval of the three agencies in charge. An annual report on the research results and conservation-restoration activities will be published by the JASA.”

Bas-reliefs on the Inner Gallery, by Professor Takeshi Nakagawa, JASA Project Co-director

[OrigE] “I am very glad to be able to inform you that we’re almost ready to start the Bayon safeguarding project. As I said at the ICC Plenary Session last year, the objective of safeguarding Angkor provided for by Japanese Funds-in-Trust with UNESCO in the third phase raised the next three points based on the Bayon Master Plan, the result of ten years of work by JASA.

[slide] This is the organizational chart of the project as HE Mr Ros Borath mentioned before. The first project: restoration work for partial dismantling and reconstruction of the southern library of the Bayon Temple. The second project: implement a permanent countermeasure for the preservation of the central tower. The third project: establish the techniques of conservation and restoration for the bas-reliefs in the galleries.

[slide] This is the schedule for the work in the southern library. As for objective 1, Mr Suzuki, JASA technical chief of staff will explain. Mr Iwasaki will explain in detail the second objective.

[slide] This is a feasibility study of the bas-reliefs. The basic factor of bas-relief degradation is water. Due to the water flow from the Bayon central tower, the bas-reliefs in the gallery gradually degrade. So we need more consideration to find a method which can stop water from flowing inside the stone blocks of the bas-reliefs and we have to test the new technique. Consequently, we may need to develop an entirely new method. We have just now organized study teams with first-class researchers and technical experts from concerned fields in Japan and had meetings to discuss and decide about the mission and to test materials on the site. And in the framework of the ICC, we hope to have an international study workshop and expand the discussion and thus find more good solutions.
Compared with the first and second JASA phases, the JASA project is operating with a small number of people. However, high quality work is expected even by a few people if it is carried out by staffs who have acquired a high level of skills based on this JASA ten-year project.

Incidentally, there is a Horyuji temple carpenter group at Horyuji Temple, which is the oldest wooden architecture in the world, located in Nara, Japan, and registered on the UNESCO World Heritage List. They have succeeded in their traditional craftsmanship which is restoring the temple. They are leaders in the restoration of cultural assets, not only Horyuji Temple in Nara but also all over Japan. The most important purpose of the third phase on the Bayon is to develop construction and restoration methods from Asian style to medieval style and to build up the Cambodian mason group for the Bayon to a level like that of the Horyuji Temple carpenters.”

**Safeguarding the Central Tower of the Bayon, by Mr Yoshinori Iwasaki, JASA Project Deputy Director**

“I will explain how we will try to restore the central tower of the Bayon. All of you are familiar with this book, the *Bayon Master Plan*, published in June 2005, one year ago. I will explain some of the important aspects that are given in detail in this book.

This central tower is the symbol of Angkor Thom. The official height is 45 m from the ground but it is actually something like 42 m. This is the ground. There is compacted fill to about 10 m in height. This is the top terrace of the Bayon Temple. From here, 31 m from this point, this is the tower itself. If we consider the stability of the tower, like this, we can think of the Italian case, the Leaning Tower of Pisa. It is at risk of falling because of too much inclination, because of weaknesses in the ground foundation. But in this case, the tower itself, even though it leans by something like 13 or 18 degrees, still cannot fall over. But there is a risk of collapse; it is not completely safe.

So what is the problem? If you look at the shape, you can identify the lack of symmetry of the central tower. Probably the original tower must have been in good shape, keeping its symmetry. In the past ten years, JASA has been trying to find out why this symmetry has been lost. And the conclusion we found is that those towers, consisting of stone masonry, stone elements, the falling down of stones is one of the main reasons. And as for foundation stability, we measured the drainage system. Since this is a compacted fill of sand, we need to have a good drainage system. Measuring the amount of the drainage as compared to the rainfall, we concluded that some water is infiltrating into the foundation itself so the need of drainage is another point to discuss.

Also, JASA has measured the vibration characteristics, putting seismometers at some points and measuring micro-tremors that are very small movements even though without any earthquakes. If a car is moving around, that causes very small movements. This is measured in time. So in one second, there is some vibration, even though the amplitude is very small. However, we have identified these movements. Fundamentally, the base is fixed and the top moves back and forth.

Also, we found that if the wind exceeds 4 to 5 meters per second, the gap between stones does not return to its original position. So one of the reasons why stones fall is because of very strong winds. I found in this area in Siem Reap, especially very strong rain at night, 20 to 40 m per second. Very strong winds have been observed.

If you look at the foundation stones, there is this kind of crack system and the tower is not rigid, it is flexible. This flexible system is affected by the strong winds, moving back and forth, and these cracks open and close. And if the wind is strong enough, this portion might just fall down, and stones can be lost all over the tower. So the fundamental idea is consolidation of the central tower, bolting it tightly inside, putting struts inside, preventing the infiltration water and improving the drainage capacity.
In order to design detailed consolidation procedures, further study of literature was required, studying the central tower, including what was done to the excavated hole at the center in 1933, in situ characterization of the foundation wall and pavement by archaeological trenching, in situ geotechnical boring to the natural ground, characterization of drainage of the pavement and foundation soil.

I would like to conclude these remarks by saying that we are grateful for the answers and useful suggestions to the questionnaires on the Master Plan of Bayon in 1999. I would like to remind you that it is dangerous not only structurally but also for general visitors. The existing crack system in the central tower is likely to result in a failure at any time.”

**Preparation for Partial Dismantling and Reconstruction Methods, by Mr Sœur Sothy, JASA Technical Team Leader**

“[OrigE] I would like to give you a brief report on the JASA site. [slide] This is the present condition of the southern library. You can see the bad condition of the big tower. The roof has completely fallen down and the stone components at the four corners have been displaced. A gap has been opened that causes erosion inside the foundation. This causes the upper platform to suffer from uneven settlement.

We already have started the architectural drawing survey and now we are completing all the drawings and also carrying out the mapping of decayed stones, gap opening and decoration lines. For the drawings, we have encountered many problems. We reviewed documentation compiled by Professor Jacques Dumarçay. This temple was built during the fourth period of the Bayon Temple so the constituent elements of this temple are not so good, although it is in better condition than the sandstone. [slide] We would like to limit the dismantled part of the temple and we can count over 2,000 sandstone blocks remaining on the tower. In the proposed section to be dismantled, we can count about 1,550 blocks that need to be dismantled.

[slide] According to the number of sandstone pieces that need to be dismantled, we need to prepare a stock yard for them. We would like the APSARA National Authority to give us the authorization to arrange three work sites: one close to the Southern Library, one in the south across from the elephant trail and one more just behind the drinking shop at the Bayon. We used that place before for the restoration of the Prasat Suor Prat.

[slide] We have one big problem, a technical problem in that we have a distance limit for a heavy crane of 25 tons that we need to use to lift up heavy materials off the southern library. The weight is over one ton. The crane can be set up close to the tower. The problem is that it disturbs tourists in the morning because many tourists like the bas-reliefs at the corner. We also have to determine how to set up the crane safely it will stand on the platform foundation.

[slide] We got advice from HE Ros Borath when he visited our site. Before setting up the heavy crane we have to excavate and remove some pavement stones from the platform and to carry out small excavations to confirm that the soil foundation is strong enough to support it or not. We already have carried out this work and now we have experts from Japan who have experience in the study of foundations.

[slide] During the restoration, we would like to look for original materials that are now scattered around the southern library. During the restoration of the northern library we could identify 51 pieces from the heaps of scattered stones. So in the case we also hope that will be able to identify some pieces nearby the tower.

[slide] This is the record of work that what we have done in the second phase and that we are continuing in this phase.

[slide] There are three heaps of scattered stone that we would like to propose to dismantle and to assemble. We hope to identify some pieces from these mounds that belong to the
southern library. In these mounds of scattered stones, we can count 5,000 blocks. The green
area is the area where we would like to stock the scattered stones removed from the mound
nearby the southern library."

Mr Katsuchi Ikeuchi, Professor, University of Tokyo

“We are also digitalizing the Bayon temple using 3D measurement equipment. The
goal of our project is to obtain 3D data for the Bayon temple to provide data for the Bayon
Master Plan, also to restore the current form in 3D. We can use such data to make media
contents for public relations, tourism and education.

We conducted various missions and we can categorize these missions into two areas. One
is global data acquisition to obtain the entire structure of the Bayon temple and also find data
such as faces of deities and hidden pediments. We conducted five missions over a total of around
100 days and each mission consisted of 15 graduate students and required a half a ton of
equipment. What we did for the global data is as follows: In order to scale a large
architectural structure such as the Bayon temple, we had to use different captors or sensors
depending on the location of the objects in the site.

To scan the deity faces of the Bayon, we used long-range laser sensors. We measured
each face from many positions from the ground or using scaffolding on the roof. The data from
different directions were integrated and a 3D digital model of each face was built. But it is not
practical to scan the upper surfaces, especially the roof, from scaffolding. For this task, we used
a laser sensor suspended under a balloon which had been developed for this purpose. Two
different types of laser sensors were alternatively equipped, depending on the distance of the
target. The balloon was manually controlled by four ropes pulled from the ground.

So this is how we obtained data. The next step is to obtain further data and of course this
data is from various viewing directions so we have to determine the relative relation between
views and to connect all the data together. However, due to the large size of this temple, we had
to develop special software to process this data on parallel computers. A single
measurement is not sufficient for modeling a huge structure like the Bayon temple. Therefore,
multiple measurements from different points of view are required. In order to construct the entire
Bayon 3D model, it is necessary to align multiple measurements.

So by using parallel computers, we developed software to run and to evenly
distribute this area and this is the structure that we obtained. Also, from this data structure, we
can create a line and from this line turn 0.94 degrees in a counter clockwise direction along the
east-west line. Also we can create a vertical line. We hope we can use this data for the next
restoration projects. Also, by using this data, we can create a virtual Bayon terrace. Of course,
this is 3D data, so we can generate a virtual tour by users. These are the stories of the global
structure. Also, we obtain fine data such as deity faces, hidden pediments. We created 173 deity
faces. These are the faces which we collected. By analyzing this research data from the JASA
we can differentiate between deva, devada and asura. We confirmed the assumptions by using a
computer. For example, this is a deva, this is a devada and we examine whether we can
verify these assumptions by using collective data. We visualize what kind of discriminator we can
use and which portion distinguishes a deva and a devada.

Also, by using classification methods we created similarity groups and it turned out that
similarity groups exist in proximity. Similarity exists at proximity locations, meaning that there
were a few independent teams of workers and they worked independently. These are the stories
of deity faces and pediments. The Bayon temple has many hidden pediments but since it is
hidden, it is impossible to take pictures. So we created special sensors and by using mirrors and
sensors, we obtained pediment data. This is pediment 24, it is the first time that this
pediment was observed.
We studied the bas-reliefs of the entire inner and outer corridors. There are many bas-reliefs which contain interesting stories. We obtained 3D data of this bas-relief. This is the JASA method, manually collecting the pictures in line drawings. These are line drawings obtained by JASA. We also try the method of using 3D measurements. Unfortunately, one measurement is quite small, so we repeat and connect them. Once we have 3D data, we can use that data for measuring various views from different directions. Also by using 3D data, we can measure how decay is going on. A line drawing provides a counter line but 3D data provides various viewing directions and enables generation of appearances in the eye of the builder. In summary, by using 3D data we try to preserve the current shapes and use such data for future restoration work. We obtained global data of the entire structure and fine data of the deity faces, hidden pediments and bas-reliefs. There are still some gaps so we try to fill these gaps and also define inner shapes and add photometric information.”

II.3.5. Contribution from Professor Claude Jacques Regarding a New Dating for the Bayon

“Since Louis Finot published the stele from the so-called Mangalārtha temple back in 1925, the approximate dates of Kings Jayavarman VII, Indravarman II and Jayavarman VIII seemed to be clearly established in the 12th and 13th centuries, as follows: Jayavarman VII became king in 1181, died about 1220; Indravarman II was installed around 1220, died in 1243; and Jayavarman VIII began ruling in 1243 and died in 1295, or at least abandoned the throne.

However, this Mangalārtha inscription that was engraved in the early 14th century left a thorny problem unsolved for both a date and a particular event, that of the death of Indravarman II. I won’t go into details about the research. I am indebted to my colleague and friend, Professor Gersheimer, for drawing these problems to my attention and to have resolved the key ones in a way that seems definitive to me.

The result is a slight change for Jayavarman VII who ascended to the throne in 1182 rather than 1181. Historically, the value is in showing that this king had gone through more trouble than was thought to gain supreme power and secondarily, based on the same research, we note that the date of consecration of the main statues of Preah Khan temple becomes 1192 instead of 1191. The greatest change involves the kings who followed Jayavarman VII. Indravarman II who came on the throne at the death of Jayavarman VII did not die in 1243 but in 1270. So based on this new chronology, this king reigned for some fifty years, while Jayavarman VIII, to whom we used to ascribe this long reign, only ruled for 25 years.

I would like to go right into the meaning of this, which seems to be very deep. You have heard me say right here that the monuments of Bayon art could not have been built under the rule of Jayavarman VII alone. I proposed the idea of considering that his successor Indravarman II, likewise a Buddhist, had completed and often modified the work of the former. This new discovery confirms this analysis and opens new perspectives on the 13th century of Khmer history. From now on we can consider that the reigns of the two Buddhist kings spanned over 80 years, which allows us to spread out the duration of the era of Bayon Buddhist art and its subsequent evolution over this period. Thus, it is no longer possible but probable that King Indravarman II was behind the Buddhist reform that introduced the omnipresent Bodhisattva Alokeshvara, a reform that Philippe Stern felt strongly about and that exerted considerable influence on the art of the time. I wonder if the famous face towers really date from the reign of Jayavarman VII. They could well correspond to the reign of Indravarman II. Now we may be able to more easily see the dividing line between the respective actions of Jayavarman VII, Indravarman II and Jayavarman VIII on the Bayon.

The discovery of this new chronology confirms my doubts not only about the architectural work done but also the changes ascribed to the royal thinking that was behind many changes to the Buddhist temples.”

Remark by Mr Azedine Beschaouch: “If our Co-chairman will allow, we would like to propose a double recommendation. The first, based on the presentation made by JASA and in particular by
Professor Katsuchi Ikeuchi, outstanding in all its aspects that may have to do with dissemination of information about the Bayon. If you allow, we would like to recommend that contact be made as quickly as possible with both APSARA and UNESCO. For APSARA, according to the rules that you will establish yourself with the Japanese team and APSARA, see how we could use these most interesting aspects of virtual tours of the Bayon in the Angkor Visitor Center. I think that would be one of the most attractive aspects that could be featured. Secondly, as you know, the UNESCO Paris headquarters has an international cultural site, a Web site, and it would be very interesting if, in harmony with UNESCO’s rules of information ethics, that some of these images could be used to continue to promote Angkor and more importantly, to promote your system. The sooner the better. That is the first recommendation. If our Co-chairman agrees, we will put it down in writing.

The second recommendation comes on the heels of Professor Claude Jacques’ most interesting presentation on this matter of dates. For years now, Professor Nakagawa will remember, this matter of dates has come up again and again. Now we have a very clear inscription, re-interpreted, that proposes dates that are much more precise. Perhaps you will allow, if the Japanese team is in agreement, that in the near future some probes could be taken under the central tower. We just heard a very remarkable presentation by Professor Iwasaki about that central tower. Perhaps some borings could be made to ascertain if the archeological date corresponds very exactly with what the inscriptions tell us. I think that the file that the JSA team has done such a wonderful job preparing year by year will now be settled definitively, this matter of dating the construction of the central tower and the evolution of the architecture. Let all take note, the specialists are clearly aware of it. It’s high time to harmonize archaeology and epigraphy. If our Co-chairmen agree, your Secretariat will write up the recommendations and will present them to you tomorrow for the approval of the ICC. Thank you.”

Remark by Professor Croci: “I would like to extend my compliments on this outstanding activity that is being done by the Japanese group. It is truly very interesting. I would like to take this opportunity to ask if we can get together to see how we can put these results into the recommendations that we are developing, the ones I showed you yesterday. The contribution made by each team should be highlighted, and I would like it if part of these results can be considered in such a way that any members who are encountering similar problems can benefit from the results obtained. I would like to add that this applies to the other teams operating here. We want to keep in touch so that the recommendations along with drawings, photographs, etc. can be of lasting and increasing value for everyone.”

The Co-chairman approved the draft recommendation made by the Permanent Secretary and acknowledged the importance of technical cooperation among the teams working on restoration of the Angkor monuments.

II.3.6. Point of Information on the Phnom Bakheng Project, by Mr John Stubbs, World Monuments Fund

“[OrigE] “It is a pleasure to be before you once again, representing the World Monuments Fund. Within that presentation, firstly news on our progress with a master plan. We very much believe in master planning. I think we’ve broken new grounds in the art of master plan production for such projects, in that we have, for this rather beautiful project, the opportunity to just do what we call an optimum approach to the development of a Master Plan. To this end, architect and heritage conservation planner Michael Ellis from Australia has taken the lead on the development of the master plan. It is a hefty document, printed on both sides, in three volumes with copies in the hands of the right people this week, the main one being of course the Angkor Documentation Center. So we invite you to look this over and ask any question you may have about it. Needless to say it will be a work in progress for some months to come but at least we submitted it formally to the ICC in compliance with our promise to produce a master plan for this project.
The table of contents indicates quite a number of subjects. The structure of the document is how they are always structured, where we deal with the past, the present and the future. I’m pleased to say here that we spent a great deal of time in ferreting out matters of value and significance of this site. Most of you are aware that we took the question of history about Phnom Bakheng so seriously that we conducted a special workshop on the matter last December. Its publication was announced just last night. So the structure is on the board here, it’s what you would expect, but I’m pleased to say within that we have emphasized some things that are suitable for this particular project.

Let me just highlight a few points in terms of the nature of the contents. Of course we put things into physical and historical context. In other ways, the structure of the document was such that we could have a summary in Volume One and a more detailed description of this in Volume Two. The next slide indicates how we have divided things into concrete projects so to speak, where we designated physical areas of the site for reference purposes with the top temple mountain structure being called Area 1, the plateau below Area 2, the slope of the site we called Area 3 and everything that is beyond the hill Area 4. Within that, we of course addressed all kinds of questions of structure, risk mapping, hydrological assessment, landscape analysis, archaeology and alike. This has been a joint venture in the true sense of the word, with wonderful participation by the APSARA Authority expertise and guidance throughout the process, especially with regards to landscape matters, circulation of the site, the parvis which is really primarily the concern of the APSARA Authority with this particular project.

I think we all very much have in our minds the crucial importance of determining significance and values. There is a long list of reasons why this is a special site that I invite you to delve into when time permits. Then we move into the question of the future, with suggestions for how to treat the resource in the future, starting with very practical matters, how to really establish prioritization of the issues of the site and questions of management of the historic resources, including of course interpretation and tourism. Policy, I suggest policy for the treatment for the fabric of the site, is a part of this as well with references to sustainable development. The master plan would be the place of course to find schedules for the production of the overall conservation and interpretation project that we have in front of us. In sum, we have completed a project identification phase. We have substantially completed as of today the conservation planning phase for the project. In this next nine months or so, we think through the period up to the next ICC meeting, we will mobilize the project physically, finalize various details, get approvals, make supplementary tests through sondages and go forward into year by year into the project, productions campaigns of implementation of the work. And we feel that the largest tasks within the project could be completed in three years if all goes as planned.

To this end, we finalized just in the last week a number of very interesting and important issues in Phnom Bakheng. We’re very much believers in workshops. They’re so efficient and it brings people together to work in sort of an office setting and here too it was a joint venture with APSARA and the World Monuments Fund. We’ve had at least a dozen people, engineers, architects, hydrologists and the like at the World Monuments Fund house here in Siem Reap working very hard last week to address the crucial issues of the geology of the site, the hydrological aspects, and all of that as it relates to structural engineering. That’s a systemic approach that had to be done using the team approach, and we are so pleased with it.

I’ll let Michael Schuller, who helped direct that workshop, say a few things about the highlights of our findings, and then we’ll move on to other matters.”

Mr Michael Schuller
“As John Stubbs said, last week we convened a special workshop to study and develop solutions for the exterior stone skin of the temple. We had team of experts working for an entire week in collaboration with the Khmer staff that WMF employs as well as professionals from the APSARA Authority to describe the situation on site, document current conditions and develop specific solutions designed to address threats arising from the geological, hydrological and structural conditions. We also have with us Raynor Show, a geologist, and Alan Ellsworth, a hydrologist who will speak about the specific conditions that we were discussing.”

**Messrs Raynor Shaw and Alan Ellsworth**

“Phnom Bakheng is unique in this region and is the only temple found on bedrock. There have been several concerns expressed in recent years about the stability of the hill. Consequently I’ve had a look at this problem over the last week. The regional context of this hill is that it is one of four residual erosion arroundances on the Siem Reap plain. If you look from Phnom Bakheng you can see that the summits of the hills in this region are concordant in their overall elevation. The indication is that originally there was a higher level surface which rivers have eroded over the plain over the years, reducing the general level from the original plateau surface at about 85 meters above sea level to a plain that was originally about 20 meters below sea level. That’s the base of the subfacial deposit in the area. So we’ve had a long period of relative stability and river erosion.

The region is seismically stable, the nearest earthquake zone is 700 kilometers to the west. In addition, we have deposition on the plain. We have evidence from drilling done in 1994 by the Japanese team that there are approximately 40 m of sediments accumulated on this plain. Indications from the Vietnamese map are that the oldest deposits belonging to what they term the Battambang formation are of the order of 500,000 to 600,000 years. So for half a million years, approximately, we had sedimentation in this area, slow sedimentation once again indicating the general stability of alluviations. So I think in terms of the general setting, we have a long period of erosion, deposition, tectonic stability probably over the quaternary, which is about the last two million years.

As far as the local stability is concerned, we have the bedrock edifice. The temple platform was cut out of the bedrock. This slope has been in existence for about a thousand years with minimum maintenance. It is in very good condition. However, by looking around exposures, it is very clear that very localized problems are occurring. These are related largely to widening in the joints, widening in the bedding planes and water flushing through the system. I think that the remedial measures that are necessary are quite small in scale but nevertheless certain problems need addressing, particularly water flushing through the widened bedding planes and widened joints. This has brought sediments to the back of the wall, so in certain cases we have hydrostatic pressure at the back of the wall and sediments accumulating behind the wall which has created destabilizing forces behind the sandstone façade. The wall around the slope is purely cosmetic, it’s a facing wall; it has no structural intentions at all. The other feature is small wedge-shaped areas. I think that when the original platform was finished, the slope was very clean with very tight joints. Over the last thousand years, the joints have wavered and certain small wedge-shaped expansion joints have developed and we really need to address cleaning off some of the wedges.

In many cases, the bedrock is massive with very tight joints, and very little treatment is needed. In other locations, we have the bedding planes which are widening or transmitting water. In other areas small wedges need treating. Another important factor is the effect of roots that are left after clearing the vegetative cover that grew up over this area. Some of these are resprouting, becoming active again. These really need cleaning out as part of the remedial measures and then the sandstone façade and laterite backing can be replaced.
In brief, the hydrologic components across the landscape can be basically described as precipitations coming in, evaporation coming off of open structures, transpiration from vegetation, runoff and infiltration of water. This can be described across the temple area. We have a description of the original temple and from observations we believe that the rain flow coming in was primarily translated as runoff from the tightly constructed stone surface at these horizontal levels. You also had some water going back as it poured down these tight stone levels. There was indeed some infiltration that would have passed through the inner temple and would have gone out of the lower walls at some point, towards the ground.

What is occurring now is that we’ve had many of the pavers, these tight stones along these horizontal levels, that are either missing entirely or in part at the upper levels and water is now infiltrating severely into these open areas. You’re seeing scour at open points along the wall where stones, paver stones coming into the walls have been removed. You’re seeing an increase and head level at the wall where the water is collected. Because of this you’re getting hydrostatic pressure behind the wall and water going into these fissures or discontinuities in the stone, which is creating surficial breaks and you’re seeing collapse currently, because of this water infiltration. The proposal to deal with this problem is to replace the upper surfaces, create a tight stone paver structure, utilizing the original construction methods. Additionally, we would put a tight stone pavement structure, in entirety, along lower sections that have been removed through weathering and excavations and put a slight grade to this, probably a 1-percent grade, in order to shut the water off more directly. You would still get a minor amount of infiltration through the temple but the temple design allows water to be transmitted naturally. The primary loss of rainwater being shed from this structure is runoff and again there is evaporation from some these upper pools.

As a hydrologist, it started to rain so I ran out into the field as fast as I could. In brief I think that this problem of severe erosion of the eastern approach to this temple could be handled by putting stones lateral to flow, both along the stairway and the parvis and across this area. And I do recommend putting in a stairway to handle the cascading water. Here is a shot of the northern slope which still has stairs that are intact. So I think there are some things that should be considered from a hill slope hydrology perspective.

The structure conditions have also been studied. We have various risks maps and conditions maps developed for all of the built elements of the site. Here the platform walls at the upper levels are in fairly good condition, the red areas at the lower level indicate unstable or completely collapsed walls. Our primary recommendation, as Alan said, for addressing the water infiltration issues and structural stability in the walls is to reinstate the original water management system, the pavings at the top surface as we saw on our mock-up during the site visit yesterday. The only modification would be adding a slight slope of 1-percent to facilitate water drainage off the platform. The walls themselves would be rebuilt with new laterite to reconstruct the original structural system.

Specifically for the next six months we have some tasks that we are looking for approval on. Firstly, many small architectural fragments remain at the upper platform levels. These are a tripping hazard and are being damaged by the pedestrian traffic. We have archaeologically documented all of those stones and we request to remove those to a safe location lower on the plateau for future conservation. We have specific geological localized areas that need to be addressed to remove unstable rocks. Hydrologically, we have some suggestions as well to reduce specific water infiltration points which would also include addressing erosion points on the east and west stairs. Structurally, we would complete the work at the southwest corner and stabilize the brick shrine at the west.”

Mr John Stubbs

So we’re faced with four choices for the preservation and presentation of this monument. And I think we’re raising here, as we did at the site yesterday, some very interesting theoretical questions of how far do we go in the stabilization of this monument. A timid approach
will not do the job. At the moment, we’ve gone through level one, through the present course of our phase of work at this point, basically propping things where most urgently needed, filling crucial voids. We’ll do a bit more of this in the next couple of months but that’s just a three- to five-year solution. Level two would be a more serious intervention involving stabilizing of all what you see there today for a longer life expectancy. There are all kinds of things one could do there. There’s not time to read each and every one but it would result in the building being stabilized and conserved and the appearance it has today would be somewhat more cleaned up.

There is a more severe level of intervention, a more profound level I should say which is restoring the whole casing of the monument, that is in sandstone, giving it an altogether new look, except for the towers, reconstruction of the silhouette of the towers. I might leave you with the idea now that if there is any tower at Angkor to be reconstructed, these might be candidates for their incredible visibility throughout the entire region. You can see these high towers of Phnom Bakheng from the airport and even the Tonle Sap and it’s truncated. So big questions are ahead of us on the matter of how far to go in reconstruction. Level four is really optimum: the appearance it had in the time of Yasovarman, in the early 10th century.

So that’s it for the structural choices that we face: the questions of hydrology, the whole issue of this mountain moving or not, which I think we’ve addressed rather satisfactorily. We would like to add a footnote to this whole presentation which includes Jane Chermayeff’s ideas for interpreting the site.”

Ms Jane Chermayeff, WMF Consultant, Interpretive Planner

“The work of the ICC of course is to safeguard the monuments at Angkor. The visitor experience at the site can contribute significantly to preservation and conservation efforts. The visitor experience at Phnom Bakheng encompasses tourism, visitor management, site planning, living heritage and interpretation of the site. When these are addressed together in an integrated approach, they can transform a tourist visit to a safe and memorable experience of Angkor’s history, culture and ecology. Realities at the site pose tremendous problems, from physical deterioration that you’ve heard about earlier to the phenomena of the large numbers that frequent the site at sunset time. We know from an APSARA study that as many as 3,000 people can visit the site in one day. However, 2,400 of those persons can descend within 20 minutes following the sunset. Each challenge demands an immediate and focused response.

To address these realities we took a three-pronged approach during the interpretative master plan initiative: first, scholarship; second, stakeholder meetings; and thirdly, an interdisciplinary approach to site planning. Some of the key initiatives are listed here. Most recently, we published with the Center of Khmer Studies the proceedings of the Phnom Bakheng workshop on public interpretation held in Siem Reap last December. We also held the very first meeting of the interpretation advisory committee established and chaired by HE Bun Narith. This group will be using Phnom Bakheng as a pilot site to develop interpretive strategies.

We respectfully request to continue to work collaboratively with the members of the interpretive advisory Committee including APSARA’s DMA1, DMA2, Tourism, Demography, Water and Forests Departments. As we complete our planning efforts, we would like to move forward with three initiatives requiring additional research and action. Recent site plan developments, including the location of the Phnom Bakheng and the Angkor Thom south gate parvis, provide opportunities to extend the interpretive area from the base of the Phnom out of the Angkor Thom moat. Of course the gem of this newly annexed area is Baksei Chamkrong, the small Brahmanic temple. Taken together, this area provides a 10th-century lexicon for understanding special and cultural developments in the succeeding centuries. Based on an analysis of visitor movement patterns and conservation needs for site closings we would develop, in tandem with the APSARA Authority, access routes, orientation panels and interpretation as organized around the theme of the 10th century.
The next step within our initiative is to also work with our colleagues to create signs up at the site, at the temple, which help the visitors understand the working progress of the conservation teams. Lastly, there are two additional proposals requiring more long-range planning. One is the interpretive panoramic route; the other is the conservation-interpretation of the historic eastern entrance. The panoramic route, as prepared by the APSARA Authority, highlights the cultural landscape. It is organized with 10 stopping points where the visitor will be engaged in important themes such as the 10th-century city layout or the Bakheng style. Given the expanded site, we will reconsider the distribution of information.

Lastly, we are seeking an important archaeology partner to work with us, to conserve and interpret the historic arrival sequence of the eastern entrance area, to provide visitors with a renewed transition from the profane to the sacred at Phnom Bakheng. In closing, in the last year and a half, a great deal has been accomplished with the help of many of you here in this room. We have identified issues, put a working team together and moved forward with an integrated approach that concerns the needs of visitors and of communities, not only at Phnom Bakheng but also in the Angkor Park and it is my privilege now to distribute a publication on the Phnom Bakheng.”

Mr John Stubbs: [OrigE] “That’s it for our presentation on Phnom Bakheng. And if we could now move over to the second large initiative of the WMF, that is our work at Angkor Wat.”

Remark by the Permanent Secretary: “First, let me remind my dear colleagues that we must comply with the procedure in effect since the Tokyo meeting. It is important that the experts here present have their say; otherwise there isn’t any real reason for them to keep attending the meetings of this Committee. A visit was made to the Bakheng and an opinion is in order, based on procedure. So kindly allow Professor Giorgio Croci, commissioned by this Committee and by UNESCO, to make an expression.”

Remark by Professor Giorgio Croci, UNESCO ad hoc expert: [OrigE] “The day before yesterday, we have been on the site to discuss and examine the result of the studies that have been carried out. I think that the phases of analysis, of anamnesis and diagnosis, using these medical terms, the first approach to the monuments, have been positive. There are interesting results and also the information that has been acquired, I think, is sufficient.

Now, we have to face the most important step, that is the therapy, the intervention. Concerning the intervention, certainly we’ll have to examine detailed drawings before giving an opinion on the proposal. But I think it could be interesting, even in this phase, to give general criteria. In my opinion, we should follow the criterion of conservation more than restoration. In my opinion, we should try to leave the structure as much as possible, certainly in compatibility with safety, durability and structural strength. But I remember that the real task, the real difficulty for whoever works in this field, is to balance between safety and conservation. So for these reasons, I think that to dismantle and to rebuild should be limited to the minimum, only where it is really indispensable to do that.

In the general proposal, I’ve seen that there is also the idea to rebuild something as the silhouette of the tower. Well in that case, I’m not against it. I could say that I could be favorable but we haven’t sufficient elements and it is a too delicate a point to be decided now. But I think that perhaps, as this silhouette is visible from long distance and is a landmark, it would probably suffice to show the shape, not with much detail. I think that it is a proposal that it would be interesting to examine.

As far as the staircase is concerned, in my opinion the original staircases cannot be utilized because that would require something more invasive than restoration, really reconstruction, because the steps don’t exist. In my opinion, conservation should be done and if you want to utilize a staircase, it might be better to put something in parallel to the staircase, a timber staircase, so that people could go up along the way of the original staircase. But I really think that to rebuild the steps would be something brand new that hasn’t any real significance.
On the other hand, I think that it is also interesting instead to climb on the staircase, also to walk along the path. It takes ten minutes, it is very nice, there is a possibility to have a terrace with a panorama with the Baray. So perhaps to leave the option of reconstructing the staircase, to think of something a little different.

Finally, concerning the structural stability. Well, I’m an engineer so I fully understand the concerns of engineers because there are hydraulic problems, there is a need to create ways for water runoff. I agree on the idea to rebuild the terraces in order to prevent water from penetrating. But even if, from the structural point of view, the optimum should be to remove some walls that are deformed to rebuild in better shape, I really think that a compromise should be found to do the least possible because even deformed walls, as I said yesterday, are traces of history. On the other hand, the monument is so large that it is impossible to dismantle everything, so perhaps if we dismantle and rebuild some parts, there will be a contrast with the older portions. I think also from the structural point of view, it would not be a good thing. So I think that really, we should follow the line of conservation as much as possible and to look for solutions to ensure stability along those lines.”

Response from John Stubbs: “Thank you, Dr Croci, for these good suggestions. We will favor that in our work from here on. Now moving along to Angkor Wat. Many of you know this project has a rather a long history. We’ve had actually a couple of teams working on it. John Sanday and Predrag Gavrilovic did the hard early work in documenting the project during the heavy structural engineering modeling and the like. Another team was brought in to supplement them, work with them very closely, led by conservator Glenn Boornazian. It has brought some really wonderful serious science to the question of what do we do to repair the Churning of the Sea of Milk Gallery at Angkor Wat.”

II.3.7. World Monuments Fund Project for Roof Repair in the “Churning of the Sea of Milk” Gallery, by Glenn Boornazian, Conservator and WMF Consultant

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II.3.7. World Monuments Fund Project for Roof Repair in the “Churning of the Sea of Milk” Gallery, by Glenn Boornazian, Conservator and WMF Consultant

“My presentation today is in response to a number of questions that have been raised as a result of the World Monuments Fund previous presentations, both on site at the Churning of the Sea of Milk and at ICC meetings.

Over the last few years, the WMF team has presented all of our on-site laboratory research to the ICC and ad hoc committee and has clearly defined the threats that currently exist. It is evident that these threats are increasing and, as an all exposed architectural settings, are becoming exponential. The WMF team has clearly and precisely outlined our recommended long-term approach for each aspect of the phase of the project and has graphically indicated why
we consider that there is only one solution which ensures the long-term effective conservation of the bas-relief.

The following is a condensed summary of our findings. As a result of the previous reconstruction of the roof and the interior of the roof vaults in its cross section, they are filled with cement repairs, pointing mortars and grouts. There are many open joints in the roof and roofing system as well as fractures and cracks throughout that system that allow water to percolate into the sandstone roof vaults and the bas-relief sculptures below. All cement repairs, pointing mortars and grouts contain a high concentration of the salt calcium sulfate. Calcium sulfate is water soluble and is easily transported by the rainwater into the stone of the roof and the bas-relief sculpture below.

Upon evaporation of the water, crystallization of these salts takes place both beneath the sculptures surface, which creates voids below the visible bas-relief and on the surface, causing accelerating decay. This decay has been exponential as can been seen by comparing close-up historic images from 80 years ago to surface and subsurface images from two years ago. So you just follow the red graphic. On the left it shows you the extensive decay in this photograph from 1929 and the more surface area that has been certainly affected over the last 80 years.

So the threats above can be defined or summed up as follows: the roof is leaking, in fact more than any other roofs at the third enclosure. Water percolating through the roof vaults becomes saturated with the deleterious salts contained in the previous repairs. These salts cause accelerated decay and loss of the sculptures below. In order to stabilize this threat and prevent further loss on the bas-relief it is essential that water entry into the roof be stopped and that the source of the damaging salts must be removed. These threats have been confirmed and are a fact.

There are therefore two options that can be considered to protect the bas-relief from these threats: a short-term solution or a long-term solution. And after a great deal of research and testing, we do not believe that there is any reliable short-term solution. Therefore, the WMF team is suggesting that a long-term repair be implemented. Such a repair requires careful documentation and careful disassembly of the roof stone directly above the bas-relief. This solution would reinstate the original ingenious passive drainage system developed by the ancient Khmers and with the installation of a thin lead barrier in certain horizontal joints would become a secondary line of defense to prevent water and salt from percolating through.

If this option is implemented a number of additional valuable interventions will also be feasible. The condition of each stone would be noted and each stone would be conserved. As much of the original material would be reused as is appropriate. As for the previous repairs, the sources of the endangering salts would be removed or salt-impermeated original stones would be desalinated for reuse. Then again, a thin lead barrier would be inserted into all the horizontal joints to serve as a secondary line of defense. In addition, after this is implemented, we think that this is the only roof in Angkor Wat in that third enclosure that will visually resemble the original Khmer appearance, as all of the previous repairs will be removed. Although an expensive venture and more complicated to implement than other less-expensive options, the WMF recommends this long-term solution because we believe that anything else would be unreliable.

At the ICC meeting in November 2005, a number of concerns were voiced by the ICC ad hoc committee. I would like to address all of these concerns right now. With regard to concerns expressed regarding the possible loss of friction due the insertion of the proposed lead barrier in April 2006, just about six weeks ago, the WMF has requested carrying out a series of 16 friction
tests using roof stones of similar shape and size to those at the Churning of the Sea of Milk Gallery. We are pleased to report that the results of these tests indicate that friction is in fact increased and the presence of the soft lead actually improves the roof resistance to sliding. We have a copy of this report for anyone who would be interested in taking it with them and examine it.

There were statements indicating that the rate of sandstone decay is slow, implying that there is no need to make an immediate decision or to take immediate action. If comparisons are made of the condition from 1929 with those of today, one can see the high percentage of loss in the sculptures. If visual and subsurface concealed ultrasonic observations are compared from 18 months ago to today, additional losses are also evident. The ultrasonic tests conducted only last week indicate that compared to two years ago we’ve had about a five to ten centimeters of additional loss. Today, the WMF is seeking the approval of the ICC to proceed with the mobilization for this project to be carried out in close collaboration with our counterpart at the APSARA Authority.

The WMF plans its mobilization as follows: preparations of a final design for the erection of a unique scaffolding system which will answer many of the questions that we feel are required of this scaffolding system to meet. The computerized documentation of each roof stone and their existing conditions, the final design outfitting and preparation of a stone conservation work facility, training in the repair by desalination of the original roof stones, as well as training for the proper installation of the lead barrier. Throughout the construction process, the WMF and APSARA Authority collaborators will work very closely together to safeguard the stability of the gallery.

As part of the solution implementation refinement process, the WMF team, also in close collaboration with the APSARA Authority, will prepare a full-scale example using the original roof stones demonstrating the insertion of the membrane. Flood tests will be conducted together on the examples to observe how the system works and if necessary only small refinements will be made through the lead barrier detail in coordination with the team. Once the final details are agreed upon, the project implementation will begin and we believe completed in three distinct phases over approximately a three-year period.

As for the transferability of what we’ve learned to other locations in Angkor park, we believe that there are many lessons learned here. Our roof and other technical studies show us that the above outlined techniques can be applied elsewhere. However, due to the important work of art contained at the Churning of the Sea of Milk Gallery and the previous structural stabilization of that gallery, the tremendous volume of research conducted by our team and the urgency of the problem, we feel that this project merits special consideration and a highly refined conservation approach. Should anyone require any clarification on any of the technical information that we’ve just discussed here today, we would be very glad to give you copies of that.”

Mr John Stubbs: [OrigE] “It’s at the invitation of the APSARA Authority recently that we have submitted our application for their kind permission to proceed with this project and it could be underway as earlier as September. That’s it for Angkor Wat and in one minute each let me just say a few words about the other two projects that the World Monuments Fund has been addressing at Angkor. One, Ta Som, we started on it in 1999 and its hallmark was that it would be run by Khmer professionals only and we have succeeded in that, I would say, to a level of 95 percent. There’s been a little bit of coaching and involvement from the international team but at this point we’re certain that is all that can be done by totally Khmer professional staff. They know how to do this better than anyone within the WMF team structure. So, we’re planning to turn over to engineer Hem Sinath the job of project manager. We hope that he can have a
counterpart assigned to him from the APSARA Authority and that the two of them can co-lead this project for the next several years.

For the next project, Preah Khan, we have the similar idea of handing that over totally to the Khmer staff that’s been trained by the World Monuments Fund over the last twelve years. We became involved with Preah Khan in 1999. The whole enterprise was towards training and perfecting techniques for all kinds of interventions at the site ranging from herbicide to structural techniques. Here again, the Khmer staff can do this work totally by themselves. We’re proposing to turn it over to Samkim Heng, an architect who’s really been in charge for the last couple of years. The garuda conservation project would go to Khmer architect Cham Phally who has already restored some 22 garudas out of the 72 that exist at Preah Khan. The last activity at Preah Khan in the years to come will deal with the interpretation of the site and continued maintenance.

Thank you, dear colleagues and Excellencies, for hearing this diverse presentation of the World Monuments Fund. We’re very happy to present the progress we’ve made today. I don’t think you’ll have such a need for such a comprehensive overview of our presentation of our work in the future. You can see that planning has finished with two projects—Angkor Wat and Phnom Bakheng—and I think future presentations to you will mainly deal with progress on the sites.”

Remark by Mr Azedine Beschaouch: “We have a point of information to make about the ‘Churning of the Sea of Milk’ gallery in view of the presentation we just had. We have been informed that the APSARA National Authority has not yet had the time to give this project the expert study it needs. Obviously, there is no objection in principle. But I would like to inform our friends with the World Monuments Fund that they have to allow time for the study. We will put in our report that although there is agreement in principle, work can only begin when the APSARA National Authority, in particular the Department of Monuments and Archeology, has finished examining the proposals. It is important to have this made clear to avoid any misunderstanding in the future.”

II.3.8. Activities of the Sophia University Mission: Annual Report by Messrs Nobuo Endo and Satoru Miwa, Sophia University Angkor International Mission, Japan

[OrigE] “It’s my great pleasure to be here to report on the activities of the Sophia Mission. On behalf of Dr Ishizawa, Chief of the Sophia Mission and President of the Sophia University, I would like to brief you about seven selected items of activities concerning the report we distributed.

Item 1: Restoration work in ‘Area I’ of the Western Causeway of Angkor Wat. This will be presented by my colleague, Mr Miwa, soon after me.

Item 2 is scientific research on the columns of Gallery 1 in Angkor Wat for the application of methods for preventing the deterioration of sandstone by weathering.

Item 3: Archaeological Survey of Banteay Kdei. The research was implemented from 2002 to 2003 and 274 Buddhist statues were found and are now in the Sophia AEON Center in Siem Reap, waiting for the construction of the new museum. Mr Furuyama will make a presentation about the new museum this afternoon.

Item 4 is the training of students at the Royal University of Fine Arts since 1991, at the Banteay Kdei temple.

Item 5 is a tentative 10-year plan for the Banteay Kdei area, including villages in Srah Srang and Srah Srang itself. This plan includes not only the conservation of the monumental sites but also capacity building of villagers and environment protection in this area. But a shortage of funds is hampering implementation of this plan.
Item 6 is the new museum I mentioned already. Mr Furuyama will present it this afternoon after lunch.

Item 7 involves the latest activities among the APSARA Authority staff, staff of the Ministry of Culture and the Sophia Mission. Nine Khmer staff members participated in this program sponsored by UNESCO. This is a two-week program deepening the understanding of Japanese society and culture.

Mr Satoru Miwa

[OrigE] “I am Field Director for Sophia University's Angkor International Mission on Angkor Wat. Today, I'd like to give a presentation on the conservation and restoration work being done on the western causeway of Angkor Wat.

First, the history. Restoration work on the southern lane of the western causeway of Angkor Wat was done in the 1960's. As for the northern lane, some previous intervention can be identified including emergency intervention after a collapse occurred in October 1952.

However, the northern lane had been untouched after the emergency intervention done in the 1950's because of civil unrest. The restoration of the western causeway was restarted in the 1990's by the Sophia University Angkor International Mission in cooperation with the APSARA National Authority.

I would like to summarize our work from the beginning until today. Prior to the start of the restoration work, we trained stone masons from around 1995 while at the same time training students at the RUFA Faculty of Architecture. We did some surveys involving a partial dismantling and we made drawings of the causeway with the students of RUFA. We started the work site in May 1998. We needed to construct an embankment to work on it, keeping it out of the water, because the foundation of the western causeway was in the mud. We likewise had to keep the southern lane free for the tourists and to protect the sandstone pavement.

We received funding from the APSARA Authority in late 1999 to cover the salaries of Cambodian experts and workers. And we started full-scale dismantling of Area 1 at the beginning of 2000. We removed 1,000 sandstones and 3,000 laterite blocks. The structure under the sandstone was completely changed on the right side. In our work, we are trying to keep the original methods as possibly as we can.

We started to install laterite blocks in the basement and the wall in July 2001. We installed buttresses to reinforce the original wall structure. We finished installing laterite up to the top of the wall in September 2005 and we started installing laterite pavement. We finished installing the laterite pavement in March 2006 and we started putting in sandstone paving stones in April 2006.

Just three days ago, the ad hoc experts visited the Angkor Wat causeway site. We thank Messrs Beschouach and Boccardi, Professor Croci, Professor Suzuki and the UNESCO members for visiting our site. We showed them our sandstone work near the central terrace on the causeway. We prepared a proof area over 15 m² as was requested at the last site visit made by the ad hoc experts in November 2005. Of course, we respected the request from the APSARA Authority and ad hoc experts and we installed sandstone paving stones at the same height as the southern lane. Prior to installing sandstones, we installed laterite blocks on sand. It is 5 to 6 centimeters higher than the original at this place. Actually, it looks good because it is one causeway and we hope the ad hoc experts will approve this and we can continue this operation to the east to complete Area 1.

For future plans, the restoration of the causeway of Angkor Wat has been implemented in close cooperation with the APSARA Authority. Area 1 will be completely finished by late 2008 or
early 2009. Phase 2 of the project will be restoration work of Area 2. And phase 3 of the project will be Area 3. Discussion will take place between the APSARA Authority, UNESCO and the Sophia Mission after completing Area 1.”

**Remark by Mr Azedine Beschaouch:** “As our colleague just stated, the group of experts and your Secretariat recently visited the work site. We were happy to note that the recommendations made last year during a major seminar with the APSARA National Authority had been followed to the letter and that now there is a perfectly harmonious junction between the section restored by the Angkor Conservation Office and the EFEO before the catastrophic events brought on by the civil war and the new section done by Sophia University. We are happy about that and extend our congratulations to our colleagues.

Let me also take this opportunity to mention for those who are not aware of it that Professor Ishizawa, in charge of the Sophia University mission, was elected and appointed rector of that university. It’s truly an honor for our Committee to have with it the rector of a major university.”

**II.3.9. Chau Say Tevoda Temple: Conservation and Restoration Operations, by Mr Wang Lei, Chinese Team for Safeguarding Angkor**

*[OrigE]* “I’m much honored to deliver this CSA restoration and conservation progress report from November 2005 up to now.

It has been six years since the Chau Say Tevoda restoration and conservation project began in 2000. And this project is fully sponsored by the Chinese Government. The project is expected to conclude at the end of this year.

So far, seven main parts in Chau Say Tevoda complex have been successfully restored. The terrace was completed in August 2000, the causeway in March 2001 and the south library in June 2003, the south gopura in July 2003, the south antechamber of the central tower in March 2004, the west antechamber of the central tower in November 2004, the east gopura in November 2004.

There are still five parts where restoration is still underway. The north antechamber of the central tower, the mandapa, the north gopura, the north library and parts of the enclosure wall.

This overall view vividly shows the current progress in Chau Say Tevoda. The parts in blue are those having been restored and the parts in red are those where restoration is still underway.

The most important problem with the north gopura restoration is how to make the color of supplemented parts look harmonious with the original ones because there is a mixing of the new parts with the old on the platform and the wall. If the color issue cannot be addressed properly, the whole exterior will be compromised.

This illustrates the progress we have made on the north gopura in the past few months. There is the north library before restoration. We include some pictures from our French colleagues from the EFEO. This is also the progress we have made in six months. The library has been completed up to the top.
This is the progress made in the central tower and the parts of the mandapa.

This is the section of the central tower. The parts in red are the parts that existed prior to the Chinese restoration operation. The blue color shows the position in which the original old components should be.

This further shows the progress that we made. The first picture is the mandapa last year, where the platform restoration is going on. The second one is the mandapa up to the second layer of the cornice. The third is the north antechamber before restoration and dismantling. And the first is restoration still under way.

Meanwhile, because our project involves comprehensive restoration, we pay attention to details. In the past few months, we have carried out the landscape planning around the temple. Six original ponds have been identified and restored back to their original shape.

Besides, we have restored parts of the enclosure wall on both sides of the gopura. On this issue, the experience we learned from the Thommanon temple, not far from Chau Say Tevoda, is vital for us to make this decision.

This is a statistical summary of new and original sandstone blocks in the restoration work we have done. In this chart, we have compared the proportion of new stone on the seven main buildings. The red color represents the new stones and the blue color stands for the original ones. The east gopura has the lowest proportion of new stones, about 2 percent, and the north gopura, unfortunately, has the highest.

Now please allow me to unveil the target of the next Chinese restoration: Ta Keo temple. Ta Keo temple was built during the end of the 10th century and early 11th century, under Kings Jayavarman V to Soryavarman I. It is a Hindu temple. Now, the current access is through the south entrance. In agreement between Chinese Prime Minister, Mr Wen Jiabao, and his Cambodian counterpart, HE Mr Hun Sen, Ta Keo temple has been selected as the continuation of CSA’s activity, and China has committed to play an increasingly important role in the Angkor area. In article 3 of the intergovernmental agreement they signed it states, and I quote: ‘At the request of the Cambodian side, the Chinese side agrees, after completing the restoration of Chau Say Tevoda temple, to help the Cambodian side restore Ta Keo temple as the second phase of the cooperation project, scheduled to be completed in 8 years (2007-2014)’.

This is the risk map of the Ta Keo temple. Now there are eight locations needing emergency intervention which were proposed by our APSARA Authority colleagues. The Chinese team initially accepts these eight very dangerous points for the first phase of the Ta Keo restoration. They are the four corners of the second platform and western gopura of the first platform, south gopura of the second platform and east gopura of the first platform. Also, a long hall on the south.

There are the four corners on the second platform. They are still very dangerous situations. Yesterday on our work site visit, we have been there and showed the dangerous conditions before restoration. There are the three gopuras on the first platform and the second platform and one long hall.
At the end of this year, a Chinese survey team will be sent to Ta Keo temple and it will conduct a comprehensive survey on it. The Ta Keo master plan will not be made until the final results of this preliminary research are released.”

Remark by Mr Azedine Beschaouch: “I wanted to let you know that in harmony with last year’s recommendation and procedure, your group of experts and Secretariat visited the site. An in-depth look at things and discussion really got us close to our colleagues on the Chinese team, and on behalf of the group of experts, with your permission, Professor Lablaude will give a brief report.”

Remark by Professor Pierre-André Lablaude, UNESCO ad hoc expert: “The ad hoc group of experts enjoyed making another visit to the site being worked on by the Chinese Government at Chau Say Tevoda. We feel that it is a most interesting example in as much as we saw this work site when it just got started a few years ago and now we see it reaching its conclusion. My colleagues and I remember the many fruitful, regular discussions and interchanges that we were able to have with our Chinese colleagues and APSARA Authority representatives on this site throughout the period of operation. Now that it has come full circle, it is particularly interesting to make an assessment of the result.

As you saw, four methods, four techniques, four intervention tools were used on this monument, as is also true of other sites at Angkor. Some structures were stabilized in their existing condition. Some parts were dismantled and reassembled. There was also some anastylosis or rebuilding of structures that had totally collapsed. Then there was the fine-tuning work that you saw, filling in lacunae with new stone beside old stone.

The monument restorer is somewhat like the garage mechanic. When he works on a broken down automobile, he can’t fix it with just one tool. The important thing is to have a number of tools in his tool kit and use them properly. Our Chinese colleagues avoided taking an overly radical approach, such as ‘keep it all like it was’ or ‘take everything down’. Rather, through discussion with the APSARA Authority and ad hoc experts, a balanced dose of various approaches was used, with a very keen sense of moderation, with some limited reconstruction, putting in some new stone and structural elements. In time, the patina will provide unity and yield a very harmonious result in the end.

But one of the other challenges of this work site is that just on the other side of the road, there is the Thommanon temple that had been completely dismantled and rebuilt a few decades ago. So the challenge was to achieve a measure of symmetry but also showing modern developments in restoration practices. So I would like to really congratulate the Chinese team for the work that was done. We can only be happy that the same team will be taking on another monument, one that is totally different in form, size, nature of its materials, modesty of its décor and its specific pathologies. Obviously the Chinese Government team will be using some of the same techniques on Ta Keo that it used on Chau Say Tevoda but in some places it will certainly have to use some different techniques.

What I appreciated very much was the diagrams. I think that the quality of restoration is seen in moderation, proportion and balance. You saw the diagrams that showed the relationship between the old and new stone and the quality of the restoration, the ever-present dilemma of how much new and how much old.

In conclusion I would like to say that the ad hoc group of experts is very happy to work again with the Chinese team and looks forward to a very productive relationship with them.”

Remark by Professor Takeshi Nakagawa: “Concerning Mr Lablaude’s comments, I would like to ask Mr Wang Lei, our Chinese colleague, about the restoration methods of Ta Keo, which we visited yesterday. As compared with Chau Say Tevoda, Ta Keo has another serious difficult
problem, that of restoring the corners of the foundation of its platform terrace. One of the main problems is to reconstruct and keep the homogeneous strength and stability of the inner structure of the foundation terrace with original, non-dismantled parts. To do this, I think it is necessary to dismantle and reconstruct an area that is a little bit wider, using original construction methods. What do you think about this problem, Mr Wang Lei?"

Response by Mr Wang Lei: [OrigE] “I fully respect the advice from Professor Nakagawa. Actually, the Chau Say Tevoda temple is the first very major restoration work for the Chinese in Angkor area. This is a way for us to learn something. For the Chau Say Tevoda temple, which is different from the Ta Keo temple, we conducted a survey on it. It is very small and compacted and the most important thing is that we are doing restoration work on one building. The restoration itself has nothing to do with other parts of the temple. So we can plan to restore this gopura first then elaborate next. If you conduct a conservation and restoration project in Ta Keo temple, it’s quite a different situation. They are internally connected.

If we work on one part of the Ta Keo temple, it will definitely have a very considerable impact on the other side. So I just think that preliminary research is very important and the final result is due to be released in the next one or two years. I think the best way for us is just to wait and see until the final result of the preliminary research is released. So I am sorry, Professor Nakagawa, now I cannot give you a very satisfactory answer. We have to wait. It depends on the scientific information we will have acquired from the Ta Keo temple, after which we will try to make the very best judgment.”

II.3.10. Point of Information on the Kompong Kdei Bridge Restoration Project, by Mr Bon Sovath, Deputy Director General, Ministry of Culture and Fine Arts

[OrigE] “Before I begin, I would like to make a small correction on the title of my presentation. On the agenda, you see ‘Kompong Kdei Bridge Restoration Project’. Actually, it is not a progress report, nor a restoration project. The presentation I present today is a ‘proposed project’. I am here today to present a paper on behalf of the Ministry of Culture and Fine Arts. The Ministry would like to share with the national and international experts a project on the maintenance and conservation of the Kompong Kdei bridge.

Contemporary with the other ancient bridges, Kompong Kdei was constructed by King Jayavarman VII, from 1181 to 1215 or, as Professor Claude Jacques just mentioned, 1220. Based on the historical records, it is known that during his rule, King Jayavarman had erected many bridges, hospitals and rest houses along the ancient roads. It is known that there are at least four ancient roads. It is now recognized that the first ancient road ran from Angkor to Pimai; the second road from Angkor to Sisophon and possibly to eastern Thailand, in the direction of Lop Buri or Ayuthya; the third road ran from Angkor to the Mekong River near Sambor (Kratie province) and it may have continued as far as the capital of Champa.

The fourth road ran from Sambor (Kratie) through Laos and northeastern Thailand as far as Luang Prabang. During the inventory mission, French officials mentioned 44 bridges. Among these, the bridge is the third largest bridge after Toap bridge and Sraeng bridge. Kompong Kdei bridge is located in Kompong Kdei village, Chi Krench district, Siem Reap province. The bridge is 84 meters long and 14.7 meters wide.

In 1960, at the request of the Royal Government, Professor Bernard-Philippe Groslier carried out a consolidation and restoration project on Kompong Kdei bridge. Also, at the end of the last millennium, the World Bank team investigated the condition of Kompong Kdei bridge and other bridges along National Road 6. The results of the previous research have contributed extensively to our maintenance and conservation project.
Today, the Kompong Kdei bridge still plays a vital role in transportation and is also a sacred place for the community around it. The bridge is one of the royal legacies remaining from the Khmer ancestors. It is our obligation to protect and preserve this priceless cultural heritage for the community and future generation. We have recently observed the present condition on the site and would like to implement maintenance and conservation work on some parts of Kompong Kdei bridge.

The Ministry’s project has two goals. The Ministry first intends to consolidate the Naga balustrades, the abutment slope protection at both sides of the bridge and to remove vegetation and silt on the river bed. The second goal is that the Ministry would like to take the initiative to establish a task force team for the protection and conservation of Kompong Kdei bridge.

There are two problems concerning the Naga balustrades. First, some sandstone blocks are missing. Second, the Naga balustrades are not in a straight line. Concerning these two problems, the Ministry of Culture and Fine Arts has two plans. Plan 1: The conservation team will look for the missing sandstone blocks and reinstall them in their original positions. Plan 2: The team will straighten the line-up of the Naga balustrades as they were originally constructed in the past.

The Kompong Kdei bridge architects used laterite blocks to construct tiered steps to protect against land erosion at the river bank near the bridge. Because of trees growing on the bank, this slope protection is deformed and some of the stone blocks have fallen into the river.

Trees growing on the bridge and riverbanks have damaged some parts of the construction. That is actually one of the main factors causing breakage of the sandstone and laterite blocks. The Ministry’s plan is first to look into the possibility of removing the trees and their roots from the bridge and the river banks. Secondly, to properly rearrange the laterite blocks to their original positions.

Alluvial accumulation has gradually eroded the surface under the bridge because the waterway has become narrower. It is now estimated that silt accumulation is between 2 and 4 meters deep. Our task is to remove the alluvium that has accumulated on the river bed and under the bridge.

During our ethnographic interview with the local villagers we learned that there are many people who come to the bridge everyday to pray for happiness and prosperity. Drawing from its sacred aspect, the Ministry plans to teach the community about the history, values and law on the protection of cultural heritage.

Our intention is to involve the villagers in the conservation of Kompong Kdei bridge by establishing a task force at the community level. This task force is composed of representatives of villagers, local authorities, the pagoda committee and the police. The team will play an important role in protecting and preserving the Kompong Kdei bridge.

The Ministry will implement maintenance and conservation work side by side with the training in cultural heritage management awareness. Finally, we believe that the establishment of the taskforce team for the protecting and preserving of Kompong Kdei bridge is an effective measure.”
Remark by Mr Azedine Beschaouch: “I would like to make two remarks. First, and happily so, these operations are taking place in harmony with the Committee’s recommendations. Three years ago, the group of experts and Secretariat visited the site and had an in-depth discussion with the national authorities in charge of the road and bridges, as well as the World Bank. The file was eventually passed on to us and studied, and we recommended leaving this bridge untouched, putting in a secondary route, and that was done. The bridge was to have been made part of Road No. 6, but now it is parallel to it. And you have seen the historical and esthetic value of this bridge. It has been safeguarded, which is something we are very happy about.

The second remark is that Mr Bong Sovath, now Deputy Director General with the Ministry, is a direct product of this new national training process at the University of Fine Arts, and that is something we are most happy about. We noted yesterday that Japan, through its Funds-in-Trust with UNESCO, helped get this training up and running. Mr Bong Sovath got his master’s degree from that university, then obtained a scholarship from Japanese funds and went on to do doctoral studies in archaeology at the University of Hawaii. Now he is both a Deputy Director General and a professor of archaeology at the Royal University of Fine Arts.”

II.4. Assessment and Prospects for New Projects

II.4.1. Ta Keo Project: Assessment of Stone Deterioration, by Professor Marie-Françoise André, Blaise Pascal University, Clermont Ferrand / CNRS, France

“It is a great honor for me to outline for you this new project being undertaken in complement to that of the Chinese CSA team on Ta Keo temple.

Our particular field of research is not structural stability, but rather the mechanisms and time factors involved in the weathering of stone surfaces. We have studied this theme both in natural settings, notably on surfaces gouged by glaciers and that have degraded over the millenniums. This has enabled us to quantify the deterioration as well as make a trial information transfer to our architectural heritage in France, such as the churches of Auvergne. In this instance, despite close collaboration with building archaeologists, we have been confronted with the problem of extensive restorations that have been done since the Middle Ages. In order to quantify the amount of stone that has suffered wear since the Middle Ages, we were looking for more authentic monuments that had been left in an untouched condition or, to quote Pascal Royère, ‘kept in their own juice’.

In December 2004, we did an exploratory campaign on fifteen or so monuments. Without going into detail, the main findings will be presented at the International Conference on Heritage Weathering and Conservation that will take place in two weeks’ time in Madrid. I will send a copy of the results to the APSARA National Authority and to the Standing Secretariat of the ICC. This exploratory campaign led us to select Ta Keo as the focus of our study. Some of you visited the temple yesterday. It is located to the east of the Angkor Thom enclosure. It seems to be a mountain temple. Because it was never completed, it is a little rough looking. It has been described as austere, sober, yet powerful. The temple was cleared back in the 1920s by Henri Marchal and Charles Batteur. Its austere appearance leads one to overlook the finely decorated south and east steps on which the moldings were surveyed by Mr Jacques Dumarçay and published in 1971.

These sculptures are suffering from a weathering process, one which is interesting to us researchers, because here we have an opportunity to quantify the amount of worn stone. The weathering process is also a source of concern, although we agree with Professor Croci that alteration and erosion are part of the history of the Angkor temples and hence alteration and
erosion are something very much deserving our respect as long as the stability of the building is not in danger.

We see another example of this weathering. The thrust of our research program is upstream from a possible conservation operation, and has three objectives. We first of all want to do a spatialized diagnosis of the current state of weathering on the sculptures, using a 3D modeling of the carved moldings on the central pyramid. Then we will reconstruct the scenario and tempo of contemporary wear over the last century. We would like to project things to the year 2030, in other words attempt to identify the probable scenario of worsening damage by zoning out the risks.

This is a research operation. We are neither conservators nor restorers. The final decision of course lies with the APSARA National Authority and the ICC’s ad hoc experts. Our feeling is that anything done should be non-invasive, simply to ensure stabilization, so as to respect the spirit of the place, the spirit of Keo the Ancestor.

I will quickly go over some aspects of our methodology. In addition to 3D modeling, our methodology leaves plenty of room for background work, as we dig into the archives of the École Française d’Extrême-Orient, the journals of the Angkor Conservation Office, Henri Parmentier’s archives, the collections of Henri Marchal and Louis Finot, which are being digitalized at EFEO-Paris. And we are building an image bank of these moldings, from the oldest currently available, taken by Dieulefils in 1909, up to the shots we took last February. The bank will also include shots from the collections and from École Française d’Extrême-Orient scholars, shots from the 1920s, some taken by Mr Dumarçay in 1967 and soon shots from Mr Claude Jacques from 1989 that he very kindly offered to share with us. Let me also appeal to all teams here who may have pictures, whether broad shots or particularly shots useful for reference, notably on the east and south sides of Ta Keo. We would like to have as many pictures as possible from different times. Naturally, this image bank will be turned over to the APSARA National Authority after completion.

Another component involves field measurements and observations, based on a protocol that we tested last February, working level by level and characterizing the forms of alteration.

To the right you can see from top to bottom the rather classical forms of horizontal splitting, detachment of plates, blistering and radial cracking that involve different processes: alternate wetting and drying, temperature variations and salt efflorescence.

An analytical component will naturally round out this work, the objective being a mineralogical characterization, characterization of patina and bio-films and identification of the salts and products of weathering.

As it comes to fruition, the Ta Keo project will naturally be conducted on the basis of a very close partnership with the Cambodian and international authorities in charge of the Angkor site. As for our scientific partners, honor given where honor is due, I would like to mention the EFEO since it has this outstanding documentary collection and image bank that I just mentioned. We have Mr Dumarçay’s seminal study on Ta Keo published in the archeological memoirs of the school in 1971. Alongside that, we have the current EFEO field team with its first-rate architectural expertise. I am thinking of the Baphuon, a temple that is chronologically close to Ta Keo, and I thank Pascal Royère for having allowed us access to the sand fill inside the Baphuon, a counterpart to the [Ta Keo] situation that is not accessible. Let me also highlight the great value of having ten years of hindsight on the Baphuon, which will enable us to gather some extremely valuable information on the time factor involved in patina acquisition on stone during this ten-year period since work resumed on the Baphuon in 1995.

I certainly cannot overlook the tremendous work done by the EFEO and other teams, including Cambodian ones, on spatial archaeology. Indeed, insight into the history of the site, insertion of the monuments and Ta Keo in particular in its forest setting, is something to be taken into consideration. We also will have a partnership arrangement with the Geology Laboratory of the Blaise Pascal University in Clermont Ferrand, our base university, and with the Geo-
microbiology Laboratory of the University of Oldenburg, with which we have been working closely for many years now, notably on the theme of the bio-deterioration of stone surfaces.

In conclusion, we are thinking in terms of a three-year program, with a wrap-up report and a set of concrete proposals for risk zoning to be presented to the Technical Committee in June 2009. A progress report will be made in June 2008. The quest for funding is going full circle. We have responded to calls for offers from the French Ministry of Culture and the National Research Agency. We have to wait until the results come in before putting a figure on the additional funding that will be needed. We welcome any suggestion you would care to make on this matter. Thank you.”

*Remark by Mr Azedine Beschaouch:* “Your Secretariat asked the two Co-chairmen, France and Japan, to have this point put on the agenda owing to a study and a conviction. The study was conducted with more than just our *ad hoc* experts, because the matter goes beyond their personal jurisdiction on a number of points, but also with specialists in the field, as called for by procedure. It is obvious, as you have just seen, that this is of value not just for Ta Keo but for all teams operating on the Angkor site. It has a future application to stone throughout the World Heritage Site. We therefore felt that this item should be on the agenda and that in our capacity as Secretariat of the ICC, we would suggest, since that is also the role of the ICC, that you approve this project. I wanted to let you know, because I discussed this personally with the APSARA National Authority, asking the APSARA Authority to give special consideration to this project because it will also enable a number of Khmer technicians to receive training in this practical area. So if it is alright with our Co-chairmen, we are going to put forward a recommendation that this important project be approved and, given the appeal that was launched, we will say that ‘any possible cooperation arrangement, be it technical or financial, would be welcome’. Thank you.”

**II.5. Research**

**II.5.1. Study on Water Stagnation, the Tree Situation and Structural Stability Aspects Regarding the Ta Prohm Temple, by Dr R. K. Sharma, Co-director General of the Archaeological Survey of India**

[OrigE] “With the permission of the Honorable Co-chairmen, I wish to proceed with the presentation of study reports for which guidelines were received from the ICC during the year 2005.

The Ta Prohm Temple Conservation / Restoration project has been undertaken in accordance with the spirit of the bilateral agreement signed between the Government of India and the Royal Government of Cambodia, in partnership with the Archaeological Survey of India and the Authority for the Protection of Angkor and Development the Region of Siem Reap and in close coordination with the ICC (UNESCO). The project was formally launched in February 2004. It now has entered into its third year activity.

A multidisciplinary approach has been adopted for the conservation of Ta Prohm temple. Reports on preliminary studies and investigations pertaining to geotechnical, foundation, structural, hydrological, botanical, archaeological aspects have been submitted earlier in February 2004. Detailed graphic, photographic *in situ* documentation of various structures in the complex has been completed and further pre-conservation documentation is still continuing. Physical conservation intervention such as lifting and stacking stones laying in the moat and the fallen stones of third enclosure gallery, east-south wing, trial pit excavation, emergency measures, etc., have been taken up in 2005.

Reports in two volumes on recent studies pertaining to structure, arboriculture, water stagnation for preservation, conservation and restoration of Ta Prohm, Siem Reap, Cambodia are
to be submitted to the ICC and APSARA Authority. The presentation on the studies in brief will be made in a short while from now on.

In the last Plenary Session of November 2005, we had submitted a comprehensive project implementation program. Consequently a joint committee comprised of ICC / ANA / MEA-Government of India / India Mission and ASI, headed by Professor Azedine Beschaouch, Permanent Secretary of the ICC, held discussions and conducted field visits to Ta Prohm in March 2006 and examined the project implementation program. Following the joint committee’s discussions and site visit, a set of guidelines for implementation of Phases 1 & 2 for preservation, conservation and restoration of Ta Prohm temple, for the period 2006 to 2008, has emerged and been approved by the APSARA Authority.

Based on the said guidelines, a work implementation plan for all the approved locations has been prepared. Copies of the project implementation program are presented to the ICC ad hoc experts.

Now I’ll proceed with my presentation on the studies on structural stability, arboriculture and water stagnation aspects of the Ta Prohm temple.

It is my privilege and pleasure to make a presentation on the further studies carried out by the experts and leading institutions from India with regard to different aspects concerning structural stability, arboriculture and water stagnation issues.

Archaeological Survey of India has been entrusted with the most challenging but equally interesting task of the conservation of the Ta Prohm temple. The harmony that has developed between the monument structures and the trees overgrowing on them needs to be respected not only as part of the history of this unique temple but also as an integral part of the site and tourist attraction. It is in this context that the conventional conservation approaches have to be modified through extensive studies, discussions and deliberations with the experts to have a better understanding of the conservation issues to attempt appropriate measures for the protection of both monument structures and trees through minimum and as far as possible reversible interventions.

First, I’ll be discussing the structural stability aspects. The studies, in this respect, have been carried out by the Indian Institute of Chennai Technology and these studies carried out in a comprehensive manner are included in books which have just been submitted to the experts.

Now, the structural issues that relate to the damage caused to the various stone structures affecting their structural integrity and resulting in partial or total collapse are foundation movements caused by the escape of sand fill from the plinth regions as well as the action of trees and tree roots on the structures. To prevent further dislodgement and displacement of stones, it is essential to take recourse to temporary and reversible interventions.

Here we can see that we have eight categories as follows:

1. Vaulted galleries and intermediate segments
2. Vaulted galleries and corner segments
3. Vaulted galleries and middle segments
4. Towers
5. Entrance pavilions (fourth enclosure)
6. Entrance pavilions (fifth enclosure)
7. Laterite compound walls
8. Other (causeways, dancing hall, laterite cells, etc.)

Here are some pictures showing the vaulted galleries and where problems are causing collapse situations: corner segment in the northwestern corner of the third enclosure;
vaulted gallery, western entrance on the fourth enclosure, eastern entrance. So these are pictures illustrating the different categories.

Now, it is essential to provide temporary and reversible interventions, and for this purpose nine emergency locations have been identified during the surveys. [slide] There are nine emergency locations that have been identified by the Indian Institute of Technology where temporary reversible interventions are immediately required as emergency measures to prevent further collapse.

The main objective for these immediate emergency measures is to ensure the safety of all visitors and prevent further collapse of any section of the built heritage. It is equally important that regular structural monitoring is also carried out.

[slide] This is how some reversible interventions for safety can be introduced to prevent collapses. These trees are also growing over the structures but this situation is very complex and in some cases, especially in this location, there are suggestions that we must also provide here some reversible temporary props and this method was also discussed during our site visit with experts and we may do some curbing and anchoring. Since the trees are there, we'll have to have a look at their situation as well.

Now, in the case of towers, the suggestion is to put in a type of rope cable on the tower. This is also reversible, there will be no dismantling and re-erection but just the cable will be provided. So this is another requirement, how the support can be provided.

It is equally important that preliminary structural analysis be carried out because the support to be provided has to be based only on the structural analysis. If the support isn’t strong enough, then the purpose will not be solved. So a preliminary structural analysis is equally important and it has been carried out.

[slide] This shows some of our calculations. Structural monitoring is a very important feature and it was discussed during the site visit also that we must go for regular structural monitoring.

[slide] Here are some of the ways we'll pursue for the monitoring system.

[slide] We’ll be using inclinometer, a load cell, tiltmeter, and so on. These are certain gadgets that will be used for the monitoring that we are planning in the very near future.

[slide] This is about the wind velocity effect, wind analysis in the preliminary structural analysis, especially in case of towers. This is very useful.

[slide] This is how the outward rotation can relate to the collapse of vaulted structures.

[slide] This is another modeling study.

[slide] Larson and Toubor have given some details that I mentioned about the nine emergency locations that are listed. We have requested the experts from this very big firm in the country. They are assisting us to determine the type of external force that can be provided appropriate to the need. Then some lab trials have also been carried out to verify the methods suggested by temporary strengthening.

There was some discussion at the site also about what material to be used for the joints because they have recommended epoxy. We do have certain reservations as far as this material is concerned under the climatic conditions of Siem Reap. There were some suggestions from Professor Croci. I hope we’ll be getting some more material from him and we’ll have to carry outside experimentation with that material.
Then the preliminary study on the instrumentation system for structural monitoring which has been already indicated and structural analysis has been carried out to understand the behavior of the towers against wind loading.

The other important aspect for which studies have been carried out pertains to arboriculture. In the preliminary studies conducted by the Forest Research Institute (FRI), Dehradun, India, a few trees have been identified from the point of view of conservation of the natural and man-made heritage. This shows the survey of the trees and their classification. In the survey, a few trees affected by termites or damaged at the top are considered hazardous. A few samples of plant material have been sent to India for further studies with regard to the health and life of the trees. As far as studies pertaining to arboriculture concern, these are very primary at the moment and more details have to be received from the Forest Research Institute. Maybe on the basis of these studies, tomography of a few select trees may be warranted to know the extent of the present shell of such trees to understand their hazardous character. However, any further measure in this regard will be subject to the recommendation and comments of FRI and acceptance by the ICC.

Now, about the water stagnation problem. This is one of the major problems as far as Ta Prohm is concerned. WAPCOS, that is Water and Power Consultancies Services Ltd., has carried out further studies pertaining to the water stagnation problem in the temple complex. A ground penetrating radar (GPR) survey has been carried out. We are showing only three survey lines where GPR survey results will be indicated but they have carried out GPR survey along 56 survey lines totaling 1,520 m in length. On the basis of this GPR survey, it has observed that most of the tree roots (more than 98 percent) are at a shallow depth, that is within a depth of 1 m and the possibility of any rot being present below 1 m is negligible. We can see most of the roots are only at shallow depth, less than 0.8 meter. We also can see the concentration of tree roots. It’s just 0.6 m and they have indicated on the basis of the GPR survey that more than 98 percent of the roots are only in the horizontal layer and within 1 m of the ground depth. But deeper than 2 m, they feel there could be some roots but beyond that, perhaps not. And this was very essential because of the technology and methodology they are suggesting for a water drainage system.

They have suggested trenchless technology for the water drainage and for that purpose the GPR survey was very essential to know the depth of the roots so that when the pipe drainage are laid they should not damage the roots and they should also not affect the foundation of the structures. This is just schematic, showing how the pipeline and shaft will be laid. But the final ideas have yet to be worked out after we have the approval of the ICC about this technology but this survey has been carried out.

It is equally important that mention is also made about the current activities being carried out by the Archaeological Survey of India at Ta Prohm temple. The documentation about the towers is in progress. External wooden supports have been put in to prevent further collapse and straps have also been put in the central pillars so that under compression they don’t further give way. Another important requirement was the wooden platform. It will facilitate the visitor movements when the water technicians are there. The stairs have also been provided.

Here, I would like to mention that during our visit to the site, remarks were made on all the proposals we have already presented and there also was a very valuable suggestion to put in a wooden platform at one or two locations so that the tourists may have access to view the collapses within the structure for a better visitor experience. We would definitely like to do this also at the suggested location, provided this is approved by the ICC.

The project implementation program on the basis of the recommendation and approval of the ICC and APSARA Authorities also deserves mention. And we have been permitted to carry out the work at five locations. In these locations, the stones have been sorted, numbered and documented and now the lower level will be documented before we carry out the restoration work. In another location, the causeway between the third and fourth enclosures, which has
been agreed by the ICC and here also, we’ll carry out the work. [slide] As for the Hall of Dancers, for time being we will not take on any work at this site because it is not possible initially take up works at all the sites. Initially we’ll only take up the work at two sites, which are the causeway and the southeastern gallery of the third enclosure.

[slide] This has also been agreed upon and this will have only support and in the nine emergency locations that have been identified. This is one of the locations, a laterite wall, fifth entrance, which has also been agreed. [slide] These towers have also been identified by IIT Madras where the rings we have suggested on the tower so no other intervention will be carried out. This is also one of the locations which has been approved by the ICC for the implementation program.

I wish to place on record my gratitude to Mr Azedine Beschaouch, Permanent Secretary, UNESCO and the APSARA National Authority for all the support extended for this project. Thank you for your attention.”

**Remark by Mr Azedine Beschaouch:** “You will remember that at the Plenary Session in December 2005, we approved in principle the project outlined by the Archaeological Survey of India and we asked our colleagues to revamp it to include the proposals made by the ad hoc experts, more specifically those resulting from the on-site discussions attended by the APSARA Authority, the ad hoc experts and the Archaeological Survey of India. I am happy to say publicly that we were most satisfied with the way in which this revised approach was developed and to say that we owe that fine result to the understanding of all of our colleagues here present and to the intervention of the new ASI Co-director General, Dr Sharma. We are happy to welcome him. Not everyone has met him because this is the first time he is with us. His presence is a token the desire of the Government of India to see to it that the Archaeological Survey of India’s key man is also the team leader. And we are already seeing what that means. I thank Dr Sharma for mentioning it. I was here on mission in March and again in May. Between March and June you see what has been accomplished and we congratulate the Indian team for this. And according to the procedure, it is up to Professor Suzuki to share with you the conclusions that the group of experts came to.”

**Remark by Professor Hiroyuki Suzuki, UNESCO ad hoc expert:** [OrigE] “I highly appreciate the efforts and insight of the Indian team in collaboration with the APSARA Authority on the very important, interesting and at the same very delicate site of Ta Prohm. The Indian team made up guidelines with the APSARA Authority for the implementation of Phases 1 and 2 of the conservation program on Ta Prohm. The guidelines are well-thought-out and reasonable both in methodology and procedure. When we visited the site the day before yesterday, emergency wooden support had been put in to protect some dangerous parts and a wooden platform and steps have been introduced for the convenience of visitors. A trial pit for drainage and an archaeological survey had been completed. All means implemented are temporary and reversible, something with which we are quite agreeable.

Personally, I’m very interested in your new method of trenchless pipeline. It may be very useful for other monuments too. But I think that how to decide the position of the pipeline will be very important so please continue your survey. Nevertheless, I fully agree that the site has a unique character. The charm of Ta Prohm consists of harmony between a monument in ruins and big trees. It seems essential to keep balanced conditions of the site. This site is filled with a kind of sense of grace. I propose careful and minimum treatment of the monument, especially reconstruction work on the dismantled south gallery. Please use the minimum, the least number, of new stones for reconstruction and keep the uniqueness of this site among all the Angkor temples. The APSARA National Authority should be sure to keep their long-term strategy for restoration and conservation. I think things should progress step by step with careful examination of every stage of restoration work, especially in the case of this precious Ta Prohm site. Thank you.”
II.5.2. Point of Information on the Jayavarman VII Hospitals Research Project, by Dr Christophe Pottier, EFEO-APSARA (France)

“In February and March 2006 the first excavation campaign was undertaken under a new research project on hospitals constructed under Jayavarman VII. This project is under the Senior Patronage of His Majesty King NORODOM Sihamoni and is codirected by Professor Rethy K. Chhem of the University of Western Ontario, Canada, and myself for the EFEO, with the assistance of Professor Alan Kolata of the University of Chicago, here present. The project is being funded in full for the time being by the University of Chicago Women’s Board. And of course it is being conducted in close cooperation with the APSARA Authority.

It is a pilot project on an original theme that involves searching for, identifying and studying ancient hospital buildings in temple perimeter areas, considered to be hospital chapels. The excavation campaign focused on the Angkor Thom western hospital chapel, Prasat Ta Muong. The team was made up of 7 archaeologists and 70 helpers from neighboring villages.

The key thrust of this campaign was to assess the extension and spatial organization of structures potentially having to do with Prasat Ta Muong that had been discovered and roughly cleared off back in 1925. A specific stele was unearthed relating to the hospitals put up under King Jayavarman VII at the beginning of his reign.

Excavations involved opening up 19 test pits over a 20,000-square-meter area based on various topographical events. A 43-meter long by 2 meter wide trench was cut into the presumed location of the northeast pond. Seven 2-meter-wide test pits were cut into the embankment of the modern canal that crosses the site south of the temple, and the other test pits were dug on a 2-meter by 2-meter module and extended when necessary. Also, the area of the presumed enclosure and central sanctuary were cleared up to the level of the original paving as had been done previously by Fombertaux in 1925.

The findings of this particularly rich campaign as far as information is concerned require studies that are still far from being completed. The test pits were filled back in just this week. Nevertheless, we can advance a few working hypotheses based on our initial findings.

First of all, it is now clear that the temple layout indeed included the typical hospital chapels. We found traces of the missing components, such as walls, the pond embankment facing and the ‘library’. These structures had been dismantled at an earlier time that now has to be determined.

The large number of test pits enabled us to highlight a variety of occupations that were quite obvious in the temple periphery. Vestiges of terra cotta tile-covered wooden buildings were found near the entrance pavilion not far away, to the east of the temple. Evidence of what we now refer to as ‘domestic’ occupation was identified to the north of the pond, including ditches, fireplaces, vestiges of fauna, etc. Three graves were excavated, giving evidence of a burial ground west and north of the temple. The graves were in the form of wide ditches containing some secondary position bones, probably charred, and various offerings of ceramics and metal objects, tools, blades, etc. These items yield a pattern that suggests a hierarchical division at the edge of the temple.

Out of all the zones investigated, the most distant test pits did not reveal any occupation specifically associated with the chapel or presence of the hospital. They are useful in circumscribing the developed area of the ‘hospital’ buildings in the immediate periphery of the temple, which area has now been reduced.

From the standpoint of chronology, the number of blocks taken from the sanctuary for reuse elsewhere seemed to indicate that at one time many buildings had been put up prior to the hospital. However, these were found only here and there, suggesting that the temple had been set up on a site of low density occupation, although probably used as farmland for a long period.
of time. The large amount of information collected will enable us to follow detailed sequences of the building and structuring of the site from the central terraces of the temple up to the fill of outer non-monument occupations. In the final analysis, we are witnessing the time when the hospital was in operation, when there were synchronous, spatially very differentiated occupations. The contemporaneity and time period of the burial site seem at this point to be synchronous with the temple, but further analysis is necessary. A later occupation was noted, in particular at the edges of the pond, even after the rather complete demolition of the temple, which is evidence that the place continued to be used after the original hospital was laid out and built.

At the conclusion of this first pilot campaign, the archeological investigation of the location has yielded vestiges of non-monument installations that made up the surroundings of this hospital chapel. It is of course too soon to say definitely that we encountered ‘hospital’ vestiges, but further questions arise for good reason. First, though, it will be necessary to do more study and refine these spatial layouts. They provide the best evidence to establish the characteristics, organization and operation of this establishment. But beyond the case of this hospital, it is important to confront these layouts with other hospital patterns and to confirm thereby that it is a layout resulting from a typical plan that is simply an extension of the temple layout itself or extending in a spectacular manner over the whole settlement.

Furthermore, it is to be noted that the discovery of graves is something that leads to an unanticipated area of investigation. The first and only Angkorian grave site was discovered at Angkor 40 years ago. The APSARA National Authority recently discovered one a few weeks ago, so it is not the only one. It has never been published, and therefore remains as obscure as all of the rituals that can be observed as a result of it. The funeral ground discovered this year at Prasat Ta Muong thus makes it possible to undertake some meaningful research on the human vestiges collected and on the persons that were buried there. In conclusion, let me emphasize that in proximity to Angkor Thom, the site is thus seen as a promising way to follow the history of the capital of the Khmer kingdom, from the restructuring implemented by Jayavarman VII up to its final decline. Thank you.”

**II.5.3. Point of Information on the Archeological Excavation Campaign by the French-Khmer Archaeology Mission on Angkor Territory Structuring at Roluos, by Dr Christophe Pottier, EFEO, France**

“This is a brief report on the excavation campaign that was carried out this year at Prasat Bakong under the French-Khmer Archaeology Mission on Territorial Structuring, which is a partnership between the EFEO and APSARA and which is fully funded by the Archaeological Excavation Commission through the French Ministry of Foreign Affairs. The objective of this research is to study changes in territorial structuring at Angkor.

This project has been reported on many times at this meeting, so I will not go into a lot of detail. I would just like to inform you that since 2004, our excavation campaigns focused on the Roluos region, and in particular on two very different but very complementary sites of structuring elements encountered in the region, Prasat Trapeang Phong and Prasat Bakong.

This year’s campaign focused solely on Prasat Bakong, which of itself is a rather vast field. Architectural studies of the temple are being continued that showed the historical complexity of this site. But these studies have been extended to the 20 or so satellite sanctuaries that are found throughout the broad enclosure area of about one square kilometer in addition to the inner moat.

In the framework of this research study on structuring elements in the environs of Prasat Bakong, the first campaign two years ago focused on the southwest corner, where a sanctuary is found that appeared earlier than the overall complex.
Here you have the stratigraphy of the test pits that confirmed that this was indeed an earlier structure, but which were actually too small to yield an adequate vision of the human occupation associated with the ritual elements or with the temples. The 2005 campaign, as you recall, also focused on this southwestern region, but this time using a 300-m long section, a transect going from the inner moat of the temple as far as the outer moat.

Here are some pictures of this site that enabled confirmation of the contemporaneity of the various structural elements of the overall layout of the Bakong complex. We were able to unearth evidence of the layout of the various occupations based on the different spaces between ritual spaces and domestic spaces.

The goals of this 2006 campaign were essentially to compare this type of information that had been gathered on a one-off basis along this transect with other areas and in particular in the eastern zone of the temple in order to assess the representativeness of the various occupational layouts from the center as far as the outer enclosure.

Here are some more pictures from this campaign that took place in February and early March 2006. Here we have, for instance, a trench dug at the foot of the temple, on the central platform as far as the inner moat of the monument, showing interesting phases of construction and the great care that was taken in building this fill embankment when the monument was first put up. Here we have trenches that extend east up to the inner moat and that continue alongside the satellite sanctuaries and that keep going east until reaching the outer moat of the overall Bakong enclosure.

Two long trenches were also dug outside of the Bakong, perpendicular to the broad eastern causeway and to its structuring buildings, one of the main features of this site. These major sections showed interesting traces of habitat and probable ancient farmlands, quite similar to the current occupation of this region.

The analytical work is still far from finished. We’re working on it. But let me share with you a few ideas in conclusion. First, the 2006 campaign enabled us to gather a fresh corpus of artifacts that rounds out what we already had and seems to confirm the very clear evolution of techniques at this time that we are putting roughly at the end of the 8th century and during the 9th century. The campaign also confirmed the relative briefness of occupation of this site, which was something we hardly suspected from our study of the temple itself. The campaign furthermore made it possible to highlight the existence of different types of occupation in the temple surroundings and, finally, the low general density of occupation of this site. It confirmed too that the understanding of the ancient capital Hariharâlaya cannot be confined to Bakong alone or even to two or three other major sites in the Roulous region but it must also take into account the bare outlines of small settlements scattered over this region in the likes of Prasat Trapeang Phong.

I would like to thank the sponsors who are backing this project as well as the various members of the mission and all of our associates. Thank you very much.”

II.5.4. The “Greater Angkor Project”: Research on the Western Mebon, by Mr Dan Penny, Project Leader, University of Sydney, Australia

This talk was initially intended to be presented to you by my co-director of the Greater Angkor Project, Professor Roland Fletcher. Unfortunately, he is unavoidably detained in Australia and has asked me to deliver it to you instead.

The Greater Angkor Project itself is a very large multidisciplinary international project that’s based on a collaborative foundation with the University of Sydney, the APSARA Authority and the EFEO. It’s been funded very generously by the Australian Federal Government since 2002 and, in the broad sense, it’s a multidisciplinary project concerned with the extent and
arrangement of Angkor but also increasingly the growth and demise of the water management infrastructure that surrounds the cities, things like canals, embankments and reservoirs.

I cannot canvass the full scope of the project for you today so I forward you to the website (www.acl.arts.usyd.edu.au/angkor/gap/) there if you’re especially interested to get a grip of the full scope of that project. So what I’m talking about today is just one small and pilot aspect of this work which takes place at West Mebon. The West Mebon, as we all know, is located in the approximate center of the West Baray.

[slide] This is a photo taken by Christophe Pottier in 2004; it’s particularly dry. You can see the West Baray is essentially dry at this time and the Mebon temple in the centre of the image there, looking northwest.

The monument itself is fairly simple. It’s a sandstone façade wall punctuated by a series of towers enclosing a shallow basin, the center of which is a platform linked to the eastern entrance by a raised platform. [slide] Here is a very crude visualization, an early visualization of what the monument might have looked like in its early phases with the Baray and the enclosed basin in full flood.

[slide] This is a picture taken earlier this year showing the state of the central basin looking west from the entrance of the entrance tower. The central platform there is under about 70 or 80 cm of standing water and the vegetation which surrounds it and is in fact floating on the water and rises and falls with the seasons.

In 2004, we conducted a series of pilot coring but you can see that the water level has fallen dramatically and the vegetation has been taken away so to expose that central walkway and the central platform. After the Baray was drained, excavations around that central platform were possible.

[slide] You can note some clearly marshy or wet ground in the background.

[slide] This is one of Dumarçay’s famous diagrams, a cut-away diagram. I draw your attention to the fact that there are two shafts or pits in the central platform and in this representation they are separate entities, quite distinct.

[slide] What I have to talk about now relates to those pits: the western pit in the background and the eastern pit in the foreground. In 2005, these were drying, the water exposing this detritus of sandstone at the base of the pits. So this is a crude diagram of the masonry structure. Intention here was merely to expose that masonry structure and get a better understanding of the relationship between these two pits and possibly the chronology of their construction.

[slide] Here we have a photograph taken during that pilot drainage, not really an excavation but a drainage, showing the eastern pit looking south and I draw your attention to some curiously shaped blocks. These are clearly radial stones that are linked to another structure. If we look back at the EFEO photos we can see that radial structure actually originates in the western pit. Maybe that raises the possibility that these two stone-lined pits are not contemporaneous but rather that the eastern pit is a later addition and somewhat of a modification of the preceding western pit.

The purpose of this western pit remains unknown but we did find some of these cylindrical sandstone blocks scattered around the central platform and within the pits, which are suggestive perhaps of a linga of perhaps a pedestal base we are not certain. Some of those cylindrical sandstone blocks though obviously not finished or not finished to a higher standard have these deep bruises along the side, the purpose of which again remains uncertain. So clearly there is a sequence there rather than a contemporaneity.
This is an image of some work that we did in 2004 with Tuos Somaneat from APSARA DMA-2 and I should take this opportunity to thank him for his hard work over many years and very trying circumstances. All the staff at APSARA DMA-1 & 2 have provided extraordinary support for our project over the years. I took a core from within the basin itself to collect sediments that had accumulated within that basin. You can see small slices of one of those cores and from those cores we can extract pollen grains.

You can see two micrographs of some pollen there from which we can construct the kind of vegetation in the basin and therefore interpret the hydrology of that system over time.

And from those microfossils we can derive these data. Safe to say that the major outcomes were that the basin of the West Mebon revealed evidence of substantial changes in the hydrology of that system including the West Baray after the 13th century that is a drying array and increasing seasonality of flow within the Baray. So in fact for only a few centuries after its construction was it operating at full capacity.

The other thing to note here is the presence of sacred lotus. You can see its presence there in the early phases of the basin indicating that this basin was possibly very symbolic with clear deep standing water and sacred lotus emerging from that water.

Coming back to the original EFEO excavations, particularly the discovery of the reclining Vishnu, the famous bronze Vishnu, we have several graduate students working on methodology and the casting processes of this particular statue or fragments of it.

These are some of those fragments that we recovered. In reconstruction it may have looked something like that, it is a very rude reconstruction and being placed within the basin. We may have had an image like this with the Vishnu surrounded by clear and deep standing water with the Baray in full flood with sacred lotus emerging from that water but I emphasize this is an image which probably lasted for only a few centuries at most before the hydrology of the Baray changed dramatically.

I don’t want to infringe on your time, but I would like to advertise the conference that’s being held at the University of Sydney. Most of you would be aware of this but I just wanted to raise it in this forum. Thank you for your time and attention.”

DISCUSSION

Question from Mr Azedine Beschouch: “With your permission, I would like to ask our friend Mr Iwazaki a question about the Bayon. Maybe I misunderstood, but when he told us about the dissymmetry of the central tower that he measured at a given time, he said it was leaning 18 degrees. Did I hear correctly? If so, that is nearly as bad as the Tour of Pisa. Maybe I misunderstood, so I am asking our friend Yoshi to give us an explanation.”

Response from Professor Yoshi Iwazahi: “The 18 degrees that I mention is the actual critical angle of the tower, from the center, so at present there is no danger at all. For the Tower of Pisa, it has a foundation problem, but here we don’t have any kind of research work on the foundation at all. However, possibly there is no problem in terms of the inclination. That’s my answer for you question.

May I make a comment to the World Monuments Fund? In Phnom Bakheng, they showed a section of the wall. It seems to me that there is no drainage system behind the wall and at that site the sandstone is inclined to one direction so if the water just infiltrated into the ground, there could be slippage to the direction of this inclination. Where the rock ends, there is the wall, so it would be better to have some kind of drainage system behind the wall. Also, they showed four kinds of restoration stages or plans. It would seem to me that the drainage system is the basic
necessity. So if the World Monuments Fund could include the drainage system in the second phase rather than the third, that would much more likely be better for the site. Thank you.”

**Question from Mr Giovanni Boccardi:** [OrigE] “My question concerns the Bayon Temple. I remember you said, Mr Yoshi, that the Central Tower was at risk of structural failure, that they were cracks, that there was a risk of imminent collapse? So does it mean that the area should be closed to the public?”

**Response from Professor Yoshi Iwazaki:** [OrigE] “I’m not in a position to decide. However we’d better compare the strength of the wind velocity and how the gap opening progressed with the wind. If I were the authority, I would like to call for a temporary closure. For the time being, monitoring should be installed. Those strong winds—20 m or 40 m per second—are based on real data. That’s probably at night with rain so the period during which the danger is expected is especially the rainy season, with heavy rains. Take some kind of gradual measures between monitoring the situation and controlling visitors. Thank you.”

**Remark by Mr Azedine Beschaouch:** “In the light of what Mr Iwazaki just said, I think our Co-chairmen will authorize the APSARA National Authority to benefit from international expertise and avoid a disaster. That's the role of this Committee, the principle of precaution, a founding principle of our work. Since he just said that there was danger, with your permission, we would like to address the APSARA National Authority and the head of the Cambodian delegation today, our dear friend, HE Mr Bun Narith, and inform him that we are going to recommend that a very quick study be made in liaison with the JASA team, Mr Iwazaki in particular, and if necessary this risky section of the monument be closed to the public. And we thank JASA and particularly our friend for his contribution.”

**Question from Mr Pierre-André Lablaude:** “I would like to ask a question of the last speaker, Mr Dan Penny, of the University of Sydney. I think that we should be very happy to see now, several decades after the studies done by Jacques Dumarçay, that a new study project on the Western Mebon is emerging. It is truly an unusual monument as you saw it in the series of slides. It is understood much better today. It is something truly unique in terms of setting, architecture and water with its water enclosures, its mirror effects that reflect the sky, the statue of the great reclining Vishnu as well as the play in its operation. It is a temple that operated as an islet depending on the variations of the Baray water level. This is something very distinctive and its quality cannot be appreciated any more. So the question I have for Mr Dan Penny is whether what you are doing is purely scientific—this is not a criticism—or if this project has a rescue and consolidation component. The monument is in great danger. Some towers have completely collapsed under the water and are covered in mud. Something should be done urgently. Does the work you are doing fit in with this?”

**Response from Mr Dan Penny:** [OrigE] “Thank you for your question. I agree that the West Mebon is an extraordinary monument in the sense that it is unique in Angkor and it is visually, even now, quite stunning. Even in its current state it still attracts tourists. Our work however, is not concerned with the monuments themselves but rather the history of the water management infrastructure. So, the West Mebon is of significance to us because it sits within the West Baray and from it we can obtain the history of that reservoir which is otherwise unobtainable. So it doesn’t fall under our purview to consider the restoration or emergency restoration of the monument. However, I do think it’s something that needs to be thought very carefully about. It is an extraordinary monument and I think that with a restoration it would be a magnificent asset to the world heritage park. But for our research we are exclusively interested in the history of the infrastructure of which it is part.”

**Remark by Mr John Stubbs:** [OrigE] “In response to Dr Iwazaki’s comments about the need for drainage behind the façades of Phnom Bakheng, I would like Michael Schuller on behalf of the World Monuments Fund to address that. In handing him the floor, I’d like to say that we investigated this very question using a systems approach considering geology, hydrology and structural engineering.”
**Remark by Michael Schuller:**[OrigE] “Well, if we look at the original construction of the walls at Phnom Bakheng, as they were constructed originally, they were a gravity type structure. Sandstone built with a laterite back up to serve as a facing to the bedrock. Now with the laterite decayed, soil in-fills behind the walls are acting as a retaining wall, which is very vulnerable to moister. We agree that any future plans for work on the site have to implement a water management system. The type of water management system will vary depending on the type of approach to conserve the walls. If walls are collapsed and rebuilt, it will take one form, but if the walls are stabilized in place, it may take another. Our primary approach to water management is reinstatement of the original water management system, which involves the pavers at each terrace level. Secondary approaches to mitigating water behind the walls mean crude placement of barriers to stop water or installation of a provisional drainage system at the base of the walls to relieve lateral pressures. Thank you.”

**Remark by Mr Tan Boun Suy:** “As Director of the Population and Development Department, I am more interested in botany than architecture. I would like to go back to Mr Dan Penny’s presentation. I see that he did a palynoligic study and according to this study, I see that there was sugar palm pollen. I have been wondering about sugar palm trees for a long time and would like to know at what time the sugar palm was introduced into Cambodia. Mr Penny’s study, at least for that date, answered my question.”

**Response from Mr Dan Penny:**[OrigE] “I emphasize that the appearance of sugar palm in that core does not indicate its first appearance in Cambodia. It’s merely the first appearance of that particular plant in that particular record. The appearance of that plant at that time probably relates to the expansion of agriculture on the Baray itself and doesn’t relate to the first appearance of the plant in Cambodia. The history of the plant in fact goes back to the 6th or 7th century, I know that from the work that I’ve done in the Angkor Baray.”

**Question from Mr Azedine Beschaouch:** “With your permission, I would like to ask our friend Mr Pottier a question. Of course, one of the aspects of the technical session of this Committee is to really learn a lot and to learn about things as varied as palynology, when sugar cane was introduced and architecture problems. Believe me, there is no UNESCO committee, no committee in any other institution in the world that has such an edge both for universal culture and for science. The question I have is, how were you able to precisely determine—because now research is being done on the hospitals—what was there to show that this chapel was set up for medical purposes, at least as a clinic or genuine hospital? How can we be sure of this? Because from an archeological point of view, you showed us that priceless photograph from the EFE0 archives, but from these formless masses, how can one be sure? Are there inscriptions that suggest this? My experience is in the Mediterranean area where we find medical instruments. Is there an inscription, medical instruments, something that shows that this is indeed a hospital structure?”

**Response from Mr Christophe Pottier:** “Due to the time limit, I had to really pack a lot of things into my presentation, and no doubt speeded over the point about the clean-up work and the fact that when the site was discovered in 1925, Fombertaux found a hospital stele right in the entrance pavilion. So this is a key point indicating that it was indeed a hospital chapel dedicated to Baishajyaguru. A second point that confirms this is the obvious similarity of the temple layout with the typical hospital chapel layout as found in over fifty examples throughout the Kingdom. So we have those two lines of evidence.

The real value of the excavation was to try to find out what this hospital was like. Obviously this campaign didn’t lead to the discovery of a medicine cabinet, surgery knives and scalpels, at least not yet, maybe later... We first want to assess the type of artifacts that were turned up and try to understand things more clearly through the domestic and human structuring around this typical layout. We are still in a preliminary phase in trying to develop an overall spatial vision of this site, seeing how big it was. It seems to have been rather modest. We are
hopeful with regard to the future as we go through these sets of problems and come across a little more material indicative of the medical aspect that we expect to find in all of this.”

**Remark by Mr Azedine Beschaouch:** “A point of general information and a point for Dr Sharma. The Chairman of the APSARA National Authority, HE Mr Sok An, the Director General of the APSARA National Authority, have designated Professor Hang Peou, a hydraulics engineer who graduated from the *Université catholique de Louvain*—where he studied and got his PhD—to be in charge, in this partnership between the Archaeological Survey of India and the APSARA National Authority, which will study with you all matters relating to hydraulics and water infiltration. We are delighted to have a young expert on the Khmer side and that you will work together in addressing this problem that the Co-director General masterfully presented.”

**II.5.5. Elemental Composition of Sandstone at Angkor, by Mr Karel Kranda, Chief Coordinator, Project for the Analysis and Dating of Construction Materials, Czech Republic**

> [OrigE] “The principal aim of the project is to show the feasibility of identifying sandstone on the basis of its unique elemental content. Should this prove feasible then we may, at a later stage, determine the origin and identity of the building materials used in the construction of Angkor monuments. In this pilot phase, the elemental analysis was principally applied to sandstone and some C-14 dating of wood samples extracted from ancient wooden planks and stakes that have been discovered by the French Archaeological Mission in Angkor Thom under the direction of J. Gaucher, when excavating the site of the Royal Palace of Angkor in the vicinity of the Phimeanakas.

The reason for analyzing sandstone is to determine the identity and origin of stone blocks. By origin, we understand here not only the locality of the ancient sandstone quarries that provided the supply of building material but also the particular strata of the sandstone deposit. Thus acquired knowledge may, at least in theory, allow us to reconstruct transportation routes of the building material and provide some information on the chronology of the Angkor monument construction. In particular, we may distinguish the original structures from their later additions or any subsequent rebuilding efforts.

To achieve the aim of characterizing the sandstone’s elemental content, we used nuclear analytical methods. We opted for neutron activation analysis (NAA) because it is one of the most powerful analytical techniques available as it can be employed to determine up to 45 elements in a single sandstone sample at even ultra-trace levels. The extreme sensitivity of this method that is based on neutron irradiation of the samples in a nuclear reactor reduces the requirement for taking large samples of the sandstone material. In fact samples of only about 100 mg suffice to obtain an adequate signal.

The second objective of this pilot study was to examine whether various wood material found within the enclosure of the Royal Palace in Angkor Thom can be adequately dated from the C-14 concentration (radiocarbon dating) in the collected samples. We intended to examine whether a precise dating of these wooden artifacts could contribute to our present knowledge of the building chronology of the Royal Palace.

**Samples**

Sandstone samples collected for the pilot experiment were loose stone fragments found at various locations of the Baphuon temple. Small samples of old and new sandstone, used to replace damaged blocks, were subjected to the NAA.

* The material presented orally before the Committee was adapted for publication in this report by Mr Karel Kranda with the assistance of J. Kučera, I. Světlík and J. Gaucher.
Wood samples were extracted from pieces of wood found in situ in the vicinity of Phimeanakas at various depths. The deepest site (2174/b) of a tested sample was 5 m below the present topsoil.

**Analytical procedures**

The sandstone samples were first ground to fine powder and homogenized in an agate ball mill. The homogenized samples with masses ~ 100 mg were packaged in pre-cleaned polyethylene capsules and irradiated in the LVR-15 experimental reactor of the Nuclear Research Institute Řež, plc., in which a neutron fluence rate up to 8.10^{13} \text{ cm}^{-2} \text{ s}^{-1} is available. Following irradiation, the activities of induced radionuclides were measured by high-resolution gamma-spectrometry. NAA is based on the irradiation of the sample with neutrons and measuring the emission of ‘delayed’ gamma-rays, which provide the analytical signal. Several irradiation and counting regimes were used to allow us determination of as many elements as possible.

The advantages of NAA can be summarized as follows: Low detection limits and applicability for minor and trace elements in a wide range of matrices, high specificity based on the individual characteristics of the induced radionuclides, the virtual absence of an analytical blank, the relative freedom from matrix and interference effects. Furthermore, there is a possibility to perform analysis non-destructively with the so-called instrumental neutron activation analysis (INAA). Normally, about 30 to 40 elements are determined with INAA in multiple matrices. This method was already tested to find clusters of similar elemental composition by investigating the following elements: Na, Al, K, Ca, Sc, Ti, V, Cr, Fe, Co, Zn, Nb, Cs, Ba, La, Ce, Sm, Eu, Tb, Dy, Yb, Lu, Hf, Ta, Th, U.

Their content in the range of 0.x mg kg^{-1} to several tens of per cent was determined by a combination of NAA and complementary analytical technique photon activation analysis (PAA), which uses irradiation with high energy photons instead of neutrons, in phonolite samples from 105 different localities in north Bohemia that were ordered into five principle clusters according to the similarity (the distance in a multidimensional space) of the elemental composition of a particular group of samples collected from various localities. As the clustering based on elemental content of phonolites mostly coincided with their geographical locality, it is feasible to perform this type of analysis and multivariate statistics with sandstone samples from Angkor.

The ~ 5-g wood samples selected for radiocarbon dating were processed according to the routine procedure entailing Acid/Alkali/Acid pre-treatment to separate cellulose followed by its combustion and benzene synthesis from the combustion products. The resulting benzene fractions were measured with a low-background liquid scintillation spectrometer Quantulus 1220. For calibration purpose, Standard Reference Material for Contemporary C-14, Oxalic Acid NIST SRM 4990C was used.

Carbon-14 (^14C) originates in higher atmospheric layers by the ^14N(n,p)^14C reaction with fast neutrons generated by cosmic rays. Thus generated ^14C radionuclide gradually spreads into the troposphere and after an uptake by living organisms, (e.g. by plants or trees during photosynthesis, by animals and man through the food chain) thus becomes incorporated into the carbon cycle. At death, further ^14C uptake ceases and from then on, its concentration decreases as a result of radioactive decay with a half-life of 5,730 years.

The ‘radiocarbon age’ of the sample can be calculated from the proportion of ^14C in the carbon isotopic mixture. Thus determined ‘conventional radiocarbon age’ is then converted to the calibrated/calendar age (in years AD). The age of the sample, which can be dated with a relative accuracy of 5 to 7 percent, spans from 0 to 50,000 years.

**RESULTS**

**Elemental content of sandstone**

The content analysis of the major elements identified in the sandstone samples appear in Table 1. Note the high concentrations of silicium and aluminum which are characteristic for the composition of a sedimentary rock such as sandstone. The standard deviation of the ‘old’
sandstone that was actually used in the original construction of the Baphuon is considerably greater (in most cases) than that of the ‘new’ recently quarried sandstone that is used to patch up the ancient structure.

Although this observation may reflect the effects of uneven weathering, the apparent homogeneity of the freshly quarried material (from one quarry) may also suggest the possibility of diverse origins of the ‘old’ sandstone samples. Apart from significantly lower values of calcium in old sandstone compared with new one, and to a lesser extent barium, which shows the opposite trend there are no significant differences between the major element content of old and new sandstone samples. However, more samples of old and new sandstone materials need to be analyzed to be able to reveal more subtle differences in the element content of both sets of samples.

**14C-dating of wood fragments**

Results of 14C-dating method are listed in Table 2. This wood fragment sample (no. 1131) was collected in the vicinity of Phimeanakas. Because of the considerable variations in the 14C carbon dioxide levels in the atmosphere through the history, it is possible to define only a range of most probable age of the samples. Thus the sample tested is most likely (i.e. with the calculated probability of about 91 percent) to come from a tree felled in within 963 and 1192 AD. Its calculated age was 986 ± 60 years.

The age distribution of another sample (174/b) appears in Table 2. The method for dating the samples was the same and allows a direct comparison of their age. This second sample is much older and its estimated age is 1284 ± 57 years. The dating values for all samples have been tabulated and appear in Table 2. Note that the age difference between the oldest and the ‘youngest’ sample is almost three hundred years.

**CONCLUSION**

The major achievement of the two pronged pilot study showed the feasibility of using nuclear analytical methods such NAA to exactly identify sandstone samples on the basis of their elemental content and that 14C-dating method can reliably discriminate between wood samples from the same location (Phimeanakas) according their differential age. The elemental analysis of sandstone can provide some kind of unique fingerprint that allows identification of samples that may belong to the same cluster as stone originating from the same location and also identify the source, namely the ancient quarry of the material itself. The differences of the elemental composition of sandstone, as documented in Table 1, used in construction of Baphuon may either come from several quarries at different locations or reflect the inhomogeneities of the sandstone compositions within the vertical strata of the sandstone deposits within one location.

To solve this question the source or sources of the quarried sandstone material need to be identified in the future. The pilot experiment utilizing 14C-dating method for identifying the age of the wood fragments excavated in the immediate vicinity of Phimeanakas have clearly demonstrated that the method we used is not just sensitive enough but also capable of temporally resolving the age of the samples tested. The age differences between the collected wood samples confirm the logic of the stratification of the excavation performed and document the consecutive periods of historical building efforts conducted at the site of the Royal Palace of Angkor by the succession of Khmer kings. Exploratory excavations and geo-archaeological augerings document that all along Angkor history, the entire area of the palace has been artificially raised. The stratigraphy of the site preceding the transformation of the place by Jayavarman VII at the end of the 12th century has brought to light the presence of numerous and varied components of wooden constructions that provided the material for the collected samples.

The oldest sample, No. 2174/b (see Table 2) gives an absolute element of dating (1284 ± 57 years) of one of the massive pieces of wood from a construction period that precedes the later construction of Phimeanakas. This element constitutes a precious chronological landmark indicating that the history of the Angkor Palace area, that is known to have been settled in the late 16th/early 17th century, may surely not have began with King Yasovarman I but already
before him. As the oldest sample dated in this study does not originate from the most ancient discovered level of the palace enclosure, its age underlines the exceptional antiquity and a long period of settlements in the area of the Royal Palace that can now be integrated in a global spatial context entailing the urban structure of Angkor Thom made of a network of streets, blocks and channels.

Table 1. Elemental composition of old and sandstone materials determined by INAA

<table>
<thead>
<tr>
<th>Element, unit</th>
<th>Old (N=12) x ± s</th>
<th>sr, percent</th>
<th>New (N=4) x ± s</th>
<th>sr, percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al, percent</td>
<td>6.70 ± 0.07 1.0</td>
<td>6.53 ± 0.12</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Ba, mg/kg</td>
<td>1080 ± 26 2.4</td>
<td>741 ± 38</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Ca, percent</td>
<td>0.713 ± 0.08 11.4</td>
<td>1.613 ± 0.06</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Ce, mg/kg</td>
<td>87.3 ± 18.0 20.6</td>
<td>85.4 ± 4.0</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Co, mg/kg</td>
<td>11.53 ± 2.59 22.5</td>
<td>10.94 ± 0.42</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>Cr, mg/kg</td>
<td>59.8 ± 9.1 15.3</td>
<td>71.5 ± 3.4</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Cs, mg/kg</td>
<td>2.06 ± 0.55 26.6</td>
<td>1.54 ± 0.05</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Dy, mg/kg</td>
<td>4.81 ± 0.75 15.6</td>
<td>4.33 ± 0.50</td>
<td>11.5</td>
<td></td>
</tr>
<tr>
<td>Eu, mg/kg</td>
<td>1.283 ± 0.14 10.8</td>
<td>1.278 ± 0.02</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Fe, percent</td>
<td>2.77 ± 0.40 14.4</td>
<td>2.88 ± 0.05</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Hf, mg/kg</td>
<td>7.60 ± 2.28 30.1</td>
<td>8.40 ± 0.19</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>K, percent</td>
<td>1.63 ± 0.22 13.5</td>
<td>1.38 ± 0.086</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>La, mg/kg</td>
<td>44.56 ± 7.47 16.8</td>
<td>46.39 ± 2.71</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>Lu, mg/kg</td>
<td>0.331 ± 0.05 14.2</td>
<td>0.335 ± 0.02</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Mg, percent</td>
<td>2.30 ± 0.24 10.4</td>
<td>2.38 ± 0.05</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Mn, mg/kg</td>
<td>585.2 ± 99.3 17.0</td>
<td>506.5 ± 5.0</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Na, percent</td>
<td>2.08 ± 0.17 8.2</td>
<td>1.95 ± 0.02</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Ni, mg/kg</td>
<td>22.6 ± 5.2 23.0</td>
<td>30.5 ± 5.1</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Nd, mg/kg</td>
<td>32.8 ± 5.3 16.2</td>
<td>32.0 ± 4.6</td>
<td>14.2</td>
<td></td>
</tr>
<tr>
<td>Rb, mg/kg</td>
<td>70.2 ± 9.7 13.9</td>
<td>54.7 ± 1.8</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Sb, mg/kg</td>
<td>0.26 ± 0.04 15.8</td>
<td>0.26 ± 0.05</td>
<td>19.6</td>
<td></td>
</tr>
<tr>
<td>Sc, mg/kg</td>
<td>8.63 ± 0.76 8.9</td>
<td>10.16 ± 0.18</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Si, percent</td>
<td>27.86 ± 1.49 5.3</td>
<td>25.36 ± 1.64</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>Sm, mg/kg</td>
<td>5.90 ± 0.64 10.8</td>
<td>6.02 ± 0.17</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Sr, mg/kg</td>
<td>172.6 ± 32.3 18.7</td>
<td>154.2 ± 20.5</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>Sample description</td>
<td>Conventional Age (years B.P.)</td>
<td>Interval of Calibrated Age (years A.D.)</td>
<td>Probability (%)</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------</td>
<td>---------------------------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>1131 – Angkor Thom South Royal Palace</td>
<td>986 ± 60</td>
<td>963 - 1192</td>
<td>91.6</td>
<td></td>
</tr>
<tr>
<td>174/b Angkor Thom South Royal Palace</td>
<td>1284 ± 57</td>
<td>653 - 875</td>
<td>95.0</td>
<td></td>
</tr>
<tr>
<td>2202 Angkor Thom South Royal Palace</td>
<td>1126 ± 56</td>
<td>778 - 1016</td>
<td>95.0</td>
<td></td>
</tr>
<tr>
<td>1082 Angkor Thom South Royal Palace</td>
<td>908 ± 58</td>
<td>1020 - 1226</td>
<td>94.1</td>
<td></td>
</tr>
<tr>
<td>13019/1 Angkor Thom South east quadrant</td>
<td>943 ± 56</td>
<td>1012 - 1214</td>
<td>93.8</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Dating of wood samples collected at the site of the Royal Palace.

Thank you very much.

The French Co-chairman thanked Dr Kranda and stressed that his contributions are providing greater insight into the condition of the stone and its evolution, while also building on work done previously by the GACP, Ms Marie Françoise Andrée and the World Monuments Fund.

II.5.6. The “Living Angkor Project”, by Professor Surat Lertlum, Chulachomklao Royal Military Academy, Thailand

I would like to give a report on the progress of our project which I presented in 2004. The project’s name is ‘Living Angkor Road’, a collaboration between Thailand and Cambodia with support from the Thailand Support Fund as well as from the APSARA Authority. Copyright of this project is with Dr Panjai Tantatsanavong of Silipakorn University. There are seven people from the APSARA Authority working in the project.

From the table of contents, I will briefly explain the objectives and the current status of our work, the major findings of our project, its output and also the next stage and the conclusion.

For the objective of this project, in short it’s a study of the ancient road, the royal road from Angkor to Pimai, in detail from the past until present times. These are the location of

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration (mg/kg)</th>
<th>Conventional Age (years B.P.)</th>
<th>Interval of Calibrated Age (years A.D.)</th>
<th>Probability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ta</td>
<td>0.682 ± 0.11</td>
<td>15.9</td>
<td>0.797 ± 0.04</td>
<td>4.7</td>
</tr>
<tr>
<td>Tb</td>
<td>0.64 ± 0.08</td>
<td>11.9</td>
<td>0.64 ± 0.04</td>
<td>5.6</td>
</tr>
<tr>
<td>Th</td>
<td>10.34 ± 1.06</td>
<td>10.3</td>
<td>11.94 ± 0.33</td>
<td>2.7</td>
</tr>
<tr>
<td>Ti</td>
<td>0.357 ± 0.05</td>
<td>14.3</td>
<td>0.408 ± 0.02</td>
<td>4.9</td>
</tr>
<tr>
<td>U</td>
<td>2.76 ± 0.51</td>
<td>18.4</td>
<td>2.98 ± 0.52</td>
<td>17.6</td>
</tr>
<tr>
<td>V</td>
<td>65.3 ± 5.9</td>
<td>9.0</td>
<td>72.2 ± 1.3</td>
<td>1.7</td>
</tr>
<tr>
<td>Zn</td>
<td>61.1 ± 6.7</td>
<td>11.0</td>
<td>60.2 ± 3.2</td>
<td>5.4</td>
</tr>
<tr>
<td>Zr</td>
<td>316.2 ± 72.0</td>
<td>22.8</td>
<td>364.9 ± 51.6</td>
<td>14.1</td>
</tr>
</tbody>
</table>
dhamasalas before we started our study. As you can, see these are the dhamasalas in Thailand and Cambodia that we already identified before we started the project.

First, the main objective is to use remote sensing and GIS. We integrated all the knowledge that it is possible to use including archaeological studies from field survey excavations, remote sensing and GIS and also a geophysics study. For the cultural study, we developed a cultural database from the data collection that we did from the survey.

This is a sample of the data to be used. We have used old maps, aerial photographs and satellite images. This is the Landsat ETM for the whole region. This is an AIRSAR of the Phnom Rung area to see the topography and the details of the subsurface. This is the elevation data between Thailand and Cambodia. This is a very important data to analyze which way the royal road was supposed to be and we’ve find artifacts and evidence.

We used a higher resolution and this is a 1-meter resolution satellite image of the Pimai area. This is the area of Ta Moan from the same satellite image with 1 m resolution and this one is a 60 cm resolution. This is the latest one, the Quick Bird, of the Angkor area, as you can see the details.

This is a list of the field surveys that we have been doing in collaboration with Thai colleagues and people from the APSARA Authority. There is a list of the few surveys that we did. Also, the APSARA Authority people did their own survey by themselves.

From the current status of our project we found part of the royal road in Thailand that had never been found before as well as missing dhamasalas, ancient communities and also ancient industries around the royal road.

This is a sample of the missing section of the royal road which has disappeared because the land has been converted into a rice field in Thailand. This is part of the royal road that still exists in very small segments in Thailand. This is very interesting, because it had been said that the royal road is only a direct line link but now we can see that there are a lot of intersections in the royal road going into ancient industrial areas. This part is in Thailand.

This is a sample of the geophysics of the royal road. After that we did an excavation and cross-sections of the road. We can identify the layer, the structure of the royal road in Thailand. This is a sample picture of a missing dhamasala in Prasat Ampil. We identified this one during our field survey together with the APSARA Authority team in Cambodia. This is the other dhamasala near the border, while this one is the Prasat Chan near Ta Moan area.

This is something interesting: the ancient stone poles along the royal road. This is the pass crossing Ta Moan Mountain in the Dangrek Mountains, in the Ta Moan area. This is in a part of the royal road that has never been seen previously.

We also did a cultural survey. We found an ancient community which is called ‘Kuoy’ in Cambodia, or ‘Suey’ in Thailand, around the buffer zone of the royal road.

This is sample of a ceramics industry site and this is a picture taken while we were doing the geophysics experiments.

This is a picture of the metal industry around the buffer zone of the royal road. We found very similar things on the Cambodian side of the metal industry around the buffer zone and also concerning the salt industry, like near the Pimai area.

I would like to present work done by the APSARA Authority team. Along the ancient road we made a buffer zone of 4 km, around each side of the royal road and we collected all the information about the infrastructures, the water structures, the temples. We separated this into four sections, as you can see, and then APSARA Authority team did very detailed data collections.
This is the pictures of the dhamasala that we discovered. [slide] These are the temples and the ancient sites along the buffer zone in the Cambodian side. Also, there are the ancient bridges. Now we have confirmed around 24 ancient bridges along the road but there may be more. We expect to find 10 more very soon. [slide] These are the water structures along the royal road. [slide] This is a list of the structures that we have found on the Cambodian side.

[slide] As I mentioned earlier, we also developed a cultural database. This is a database done by the APSARA team. [slide] There is all the information about the village in the buffer zone. The documentation is in Khmer but the English and Thai versions will come soon. We will develop a standard cultural database including the tangible and intangible structures. In detail, we need to make some adjustments because the way the data is treated in the two countries may be a little bit different.

Also, for the output of this project, there is a lot of information: the basic GIS database, a cultural database and 3D modeling. [slide] This is a sample of the 3D modeling of the dhamasala, after which we’ll do a simulation of the landscape. So for the current data, after we identified the structure of all this information, then we will start the next phase, which is to identify all the ancient communities, all the ancient industries in detail in the buffer zone of this royal road from Angkor to Pimai, study the ancient industry, ancient community and develop an information system and also develop educational information for the people.

[slide] This is a picture taken during the New Year, along the royal road and you can see people from the Cambodian side and from the Thai side going to meet and celebrate. This is something that we’re looking forward to in the future.”

II.5.7.1. Research on Prasat Top West and Research Project on the Tani and Sor Sei Kiln Sites, by Professor Sugiyama Hiroshi, Nara National Research Institute for Cultural Properties, Japan

“I would like to present the activities of the Nara National Research Institute for Cultural Properties in Nara. Our institute has been doing cooperative research with the APSARA National Authority for a long time now. We have two research projects, one on the ceramics kilns and the other on the temple of Prasat Top West.

As for the kilns, we did excavations at Tani. This project has now been completed and we published the results in 2004. We also have research projects at Sor Sei and Knar Po.

Prasat Top West is located inside Angkor Thom. The first excavation was done in 2003, south of the Buddhist terrace, and the second in 2004 on the terrace itself. At that time we found that the ground had been totally worked prior to construction of the terrace. We also found a Buddha statue in the center of the terrace. The third digging campaign took place in August 2005, north of the Buddhist terrace. On this location, we found a number of roof tiles. It is thought that the wood building under the terrace collapsed to the south. We also found some relics in the terrace.

The fourth excavation campaign took place in December 2005 under the Buddhist terrace and at the sema. The Buddhist terrace contains relics above and below. Evidence of wooden uprights from the wood building was found under the terrace. A limestone cavity is found at the terrace edge and above it a mound of laterite. During the fourth excavation, we also dug around the sema in the northeast corner of Prasat Top where we found a ditch to hold the sema. Thank you for your attention.”

II.5.7.2. Joint Research Project on Ta Nei Monument Stones, by Ms Yoko Futagami, Japan Center for International Cooperation in Conservation, National Research Institute for Cultural Properties, Tokyo, Japan
"The APSARA National Authority and the National Research Institute for Cultural Properties in Tokyo have been conducting a joint research project in the field of conservation science since 2001. The joint research aims at the cleaning of stones but this time we won’t present a cleaning experiment but briefly a number of topics focusing on the identification of microorganism on stones and environmental measurements in 2005.

Stone materials of the monuments have a large amount of microorganisms that disfigures the building. In this context, an identification of lichens and mosses was made by the botanists who joined our group. Please note that this result is not published yet so please do not refer the data to other media for now. Through the identification of lichens, 22 species representing 20 genera are identified as shown in the handout.

This photo is showing the lichens found in Ta Nei. These species are distributed in the tropical and subtropical area but most of them are reported in Cambodia for the first time.

Speaking of the variety of the substrates, I mean laterite sandstone soil, the same species of lichen are found on the various substrates but the proportions of species are different.

Regarding the investigation of the mosses, species as shown in the hand-out have been identified as well as other results shown in these slides and photos of mosses at Ta Nei.

To obtain the data for considering the prevention of the growth of microorganisms by changing the environment, our group has been carrying out micro-environmental monitoring. According to the data from the Weather Station at Siem Reap, the diurnal range of temperature is wider than inside the Ta Nei temple. The reason for this difference is that Ta Nei is located inside a dense forest and the building walls store the heat in the hot season. The relative humidity falls after 8 a.m. when the sun shines in the inside of Ta Nei temple and then rises starting from 4 p.m. The minimum relative humidity is lower than 50 percent in the dry season.

The wind velocity is high during daytime and becomes low during nighttime. The maximum wind velocity increases from the end of the dry season until the rainy season and becomes lower in the beginning of the dry season. Compared to the result from the Irrigation Office in Siem Reap, the measured wind velocity is around 10 percent of the data at Siem Reap, because the measurement point is surrounded by ambulatories and the building itself is in a dense forest. The trend of prevailing wind is different from that in Cambodia because the wind direction is also influenced by the arrangement of walls and buildings.

This slide shows the sun position diagram from the hemispherical photograph. As you see in the slide, 60 percent of the sky was covered by trees and the surrounding buildings. Furthermore, direct solar radiation is cut due to the direction in which the sun hits the building in the morning from October to February. The maximum amount of solar radiation is recorded in May, but the rate is lower compared to other places with the same latitude. This is mainly because the radiation is cut by trees and also because of water vapor in the air due to the cloudy weather so that the atmospheric transmission becomes lower.

Regarding the investigation of microorganisms, more detailed identification of lichen and studies on the effects of microorganism on those stones will be conducted next month. Besides, a cleaning experiment based on the research will also be done. The environment at several points will be estimated by using numerical simulation methods. The result will be compared to the distribution of microorganisms and the deterioration of the building in order to clarify the relationship between the presence of plants growing on the temple structure and environmental conditions. This work contributes to learning more about the stone disfigurement caused by the presence of microorganisms on Ta Nei temple. Thank you very much."
II.5.8. Research on Prehistory and the Environment in the Angkor Region, by Professor Sergey Lapteff, International Research Center for Japanese Studies, Japan

“[OrigE] “Our center is just going to start its research in Angkor region and we don't have any results yet but I will present you our opportunities and plans for the judgment of the International Coordinating Committee.

Our center was founded in 1987 by Prime Minister Yasuhiro Nakasone, who is very much involved in the development of the humanities in Japan. The organizer of our center, Professor Umehara, is well known in Japan as a philosopher. He is also known as a theorician of civilization and environment. He agreed to be our advisor in a program with the APSARA National Authority. Due to the concern of Prime Minister Nakasone, we’ve got very good equipment, good laboratories. Around 600 people gather once a month at our center. And we have very good laboratories such as a liquid C14 analysis laboratory, DNA laboratory, pollen, flora and plankton. Such laboratories are very rare in Japan in general but I think only our institute has all this equipment under one roof. That’s why one of the aims of our project is the training of Cambodian specialists in our center in Kyoto and also inviting some specialists from Kyoto to Siem Reap for training.

Our program consists of three main points so our aims are: research on the prehistory of Angkor, research on paleo-environment in the Angkor region, and the training of Cambodian specialists in new archaeological and paleo-environmental technologies. The leader of our project is Professor Yoshinori Yasuda, Deputy Director General of the International Research Center for Japanese Studies, member of the Royal Academy of Science of Sweden, nominated for the Crawford Prize by the Nobel Foundation for his research in Yangtze River. He is going to be co-director of our project, together with HE Ros Borath for the APSARA National Authority. Last year Mr Borath visited our center and inspected our laboratories. I am an archaeologist myself and will be the deputy director of this project.

In the archaeological part we, in the first stage, are going to make a map of prehistorical mounds and other prehistorical sites in the Angkor region and we will use radio-controlled helicopters, GPS stations and other equipment. In the second stage, we’re going to excavate round mounds in the Angkor region. As we were told by the APSARA National Authority, there are about 80 round mounds which are connected with the prehistoric period in the Angkor region.

As for our paleo-environmental research, we are going to do some core drillings on the lakes in the Angkor area for the purpose of getting annually laminated sediments. This will enable us to reconstruct the paleo-environment and development of nature in the region from prehistorical times until now. So from one point of view, we are reconstructing human prehistory in the Angkor region. In another point of view, we are reconstructing nature. So we can understand what the human impact on nature was and how human activities influenced flora development.

In February this year, my director general and I had the opportunity to discuss this project with the Chairman of the APSARA National Authority, HE Sok An, who asked us: Why did the Angkorian civilization collapse? Does it have any relation with the destruction of nature by human activities? Our work in the Angkor region is going to answer that question. So this is our project and we are waiting for the opinion and the approval of the International Coordinating Committee. Thank you for your attention.”

Remark by Pierre-André Lablaude: “Regarding our colleague’s presentation about the problems of lichen and stone cleaning, I would like to point out that this is a matter that has come up again and again in our technical debates. In principle, I feel that we should beware of taking the position that we absolutely have to clean things off when we restore. In some restoration operations, cleaning things off does indicate that restoration work was done, but it can also be destructive of the materials we are working with. We have some examples of clean-up jobs that may actually have been damaging to some structures and, in any event, two, three or four years
later and the successive rainy seasons, they are totally undone. The monument returns to its previous color. Sometimes these organisms actually contribute to the esthetics of the monument. So I think that when dealing with problems of this nature, we really should avoid confusing a concern for esthetics with the concern for conservation, and I am very happy that our Japanese colleague is making progress in this very complex and problematic area.”

**Remark by Mr Milan Šimco:** “My name is Milan Šimco, I am from the Czech Embassy in Bangkok. I would like to add a complementary remark to the presentation of Mr Kranda to introduce the nuclear analysis method that will be used in the project that will be implemented in the near future in close cooperation with the APSARA National Authority and with the support of the Czech Government. The implementation of this project and the relevant financial budget was approved by the Government of the Czech Republic last year and the project was put on the list of foreign development assistance programs of the Czech Republic for 2006 and 2007. This project is financed by the public budget and according to the Czech law, the granting Ministry is responsible for the selection procedure of the company that will carry out this development project. I can confirm that the selection procedure is underway and close to completion. According to the actual time schedule, the selection procedure will be completed at the end of July and full-scale implementation of the project will get underway in September 2006.”

**Question from Mr Azedine Beschaouch:** “I would like to ask Dr Kranda a question, not to get into a long discussion, but simply to make clear his position. Several times he mentioned using carbon-14 for dating. I belong to a generation when carbon-14 was the ‘in’ thing from prehistorical to historical times. And over the last ten years, there has nary been an archaeology conference where this has not been debated and where we have not been cautioned about misuse of it in dating. We are happy to see that you have an experienced archaeologist on your team, our colleague Professor Gaucher, which is a good thing. But can you tell us something about the use of this method, since the ICC is also a venue, I repeat, to learn things?”

**Question from Mr Claude Jacques:** “I was very interested in the description of the Royal Road. I would like to point out that in the Preah Khan inscription we find the number of what we used to call *dhamasalas*, but in fact are referred to in inscriptions as ‘houses of fire’. That term is much more meaningful. We once thought that *dhamasalas* were some kind of inn, but that has nothing to do with it. When you look at the Angkor Wat and Bayon bas-reliefs, you can see that when the king was traveling, there was always an arc of fire in the midst of the troops, and I think that these ‘houses of fire’ which is the exact meaning of the words in Sanskrit, were a kind of rest area. The kings travels could be followed, I dare say, by these houses. It is interesting that new ones have been discovered. A few years ago I helped a young Thai student with her thesis. She had found a few of these houses, but that’s all. I am happy to learn that more have been found, but the relationship should be seen with the Preah Khan stele. Thank you.”

**Remark by Mr Tan Boun Suy:** “I would like to say something about the lichen problem because I have been making observations on lichens for three years now. I am coming to the conclusion that some lichens die spontaneously due to iron poisoning. Some species disappear but are soon replaced by others. That is a capsule of what I have observed.”

**Remark by the French Co-chairman:** “I would like to take advantage of our Standing Secretariat. You see the depth of our discussions, the proposals and recommendations that are being presented. During our two Committee meetings in 2005, many recommendations were made. But we are also interested in assessments and results. As has been our custom, I would like to propose that our Standing Secretariat give us a report at our upcoming Plenary Session on the results, the follow-up, the outcome of the recommendations made at the 14th Technical Committee meeting of the ICC just a year ago, as well as at the last Plenary Session.

The second proposal that I could make, involves the problem of support and assessment of the new media tools we have. We were of course very impressed this morning with the new 3D computer graphics or artificial images. They are obviously a new means for research and the scientific method. Perhaps, at the workshops that generally precede our meetings, we could look
into the issue of the enhancement, the real value-added of these new methods of information processing in the framework of scientific methodology. That’s a proposal that could be made and could be used as we prepare for our upcoming meetings.”

**Remark by the Permanent Secretary:** “You kindly mentioned the first matter to me a little while ago. I would like to say that I had seen it coming this time, but I appreciate your point of view, because it would be better to use the Plenary Session to report on all technical issues rather than the Technical Session. So I would like to inform all of our colleagues here present that this will be done at the next meeting. Your Secretariat will report on implementation of the Committee’s recommendations and decisions. In this way, once a year, we will have a specific catalog of our achievements.

On the second point, thank you for your suggestion. Actually, we sort of read your mind, because Mr Ros Borath and I were talking about this recently. At the recent workshop on ceramics that he masterfully organized, we were wondering what the next theme could be. By stroke of coincidence Mr Ros Borath is proposing the following theme: ‘Assessment of Advanced Methods and Techniques for Enhancing Cultural Heritage Value and Communication’. You mentioned the different mediums and we will have a workshop on this point and report on it to the ICC. So if everyone agrees, we will make this into a recommendation. I think that our two Co-chairmen will allow the Secretariat to make this recommendation.

Just an item of information for Dr Lapteff: A couple of months ago an important book was translated into French. It had been released just 8 months earlier in the United States. The author is a renowned specialist in paleogeography and is a civilizations historian. It is uncommon to find someone who is both a historian and geographer. His book deals with the end of civilizations. I read what he had to say on Tikal and Guatemala. What is of interest is that there are rather outstanding links to Angkor from the standpoint of climate, of paleogeography. I haven’t finished reading the book, but I wanted to tell him one of the author’s conclusions. He feels that Angkorian civilization died as a result of environmental problems, trees and water. The author says that he visited Angkor twice, but he studied it based on archives and many reference books. But he comes up with this very significant conclusion. So if Dr Lapteff’s Japanese team could see if this conclusion is true or untrue, or if it needs to be qualified, that would be something very important.”

The French Co-chairman supported the proposed recommendation by the Permanent Secretary and introduced the next set of presentations on sustainable development, with the first section dealing with human resources.

### III. SUSTAINABLE DEVELOPMENT

#### III.1. Human Resources

**III.1.1. Presentation on the Exchange Program Between the APSARA National Authority and the Versailles Public Institution, by Ms Christine Albanel, Chairperson of the Versailles Public Institution, France**

“On Friday afternoon I had the great pleasure of signing with HE Deputy Prime Minister Sok An a new cooperation agreement between the APSARA National Authority and the Versailles Public Institution, more specific and more ambitious than the first one. I was very happy about this because I am totally convinced that this arrangement and the projects relating to it will be very fruitful. At first glance Versailles and Angkor seem to be very different. Of course, the time periods are different. Versailles was primarily intended to be a royal residence while Angkor carries a very obvious religious dimension. And naturally the sizes of the sites are not at all
similar, Versailles having a mere 800 hectares compared to the 400 square kilometers of Angkor, which is an enormous difference.

But beyond those differences, there are many points of mutual interest that give real meaning to this cooperation agreement. The first and most important point is perhaps the meaning of Versailles and Angkor to our respective countries and peoples. Both of them go back to signal events of our history. They are cradles of civilization, locations playing a crucial identity role for both the Khmer and French civilizations. As such, it is only natural that both of them are included on mankind’s World Heritage List, in the very strict meaning of heritage that mankind is legitimately proud of.

Beyond this philosophical and historical relationship, we also see that Versailles and Angkor are confronted with somewhat similar sets of problems. Firstly there is that of safeguarding and conserving a heritage of both mineral and plant components. In France, the plant cover at Versailles is what distinguishes it from many other monuments. I am sure that Pierre-André Lablaude, who is here as a UNESCO expert, but who is also the architect in charge of the Versailles gardens, agrees with me. That leads to all manner of discussions, such as what historical state should be reconstructed, to what extent should nature be controlled, and so on. And these are also burning issues at a place such as Ta Prohm.

Secondly, we have a mutual concern with regard to water. There is water everywhere at Angkor, no doubt about it, and I observed what is being done to restore moats which have a very significant role. Water is likewise a major issue at Versailles, or rather, the lack of it, which is a recurring problem. Water sets the pace for life at Versailles and the full concept or project relating to it.

Thirdly, we have to resolve the issue of insertion into the environment. We want to determine how to make these prestigious sites into something that is not just a list of do’s and don’ts for the communities living around them. We want them to be a source of development, a source of profit, a source of employment. I realize just how important the APSARA National Authority feels these issues are; they are of paramount concern.

Another set of problems involves the need to find or develop our own-source funding, which means funding beyond government grants or foreign aid, funds that can be sourced by means of private, national or foreign sponsorship or patronage.

Lastly, we have to deal with problems relating to mass tourism. Angkor and Versailles are both among those rather rare places that receive over a million visitors. We are reaching the figure of 4 million paying visitors at Versailles. Angkor has gone over one million, but looking at the figures, there will undoubtedly be exponential growth and in the next few years you will certainly catch up to Versailles and even pass it, given the size of your site and all that it has to offer.

So on all of these points and many others, there are many reasons for us to get together and talk, to organize exchanges. This is all the more relevant as Versailles is right now going through a period of major change, with many projects. There are major architectural projects involving the castle as well as the gardens. The Government is now caring for all of that. We are calling it ‘Greater Versailles’. We are taking advantage of this work to complete other things, to get a general movement going in all areas. So we may have the opportunity to tell you what we have achieved, share our experience with you and make some recommendations. You may be interested in one aspect or the other.

One of the very real problems we are working on is the management of visitor flows, a problem that has constantly been with us. We want to avoid having everyone at the same place at the same time. This is a problem with all the groups that come to Versailles. We are of course working upstream with tour operators. We are putting a ceiling on the number of groups in the castle at any one time. To do this, we are working on a very big advance booking system via the
Internet. I think that the Internet is a tool that has a lot to offer. I was surprised to see how many Internet cafes or clubs there are in Siem Reap and Phnom Penh.

So we can see that there are many resources available for advance booking that will make it possible to assign time slots in advance for the main visitor itinerary. This could be applied to other sites or temples. It might stifle the visit somewhat, but it could be organized. We are going to be developing this project in the next few years in a public-private partnership arrangement. The Public Institution will have a private corporate partner. We are looking at a 15-year time frame, and we are now at the stage of calling for bids.

This is being done in tandem with a simplification of our fee structure. We are strongly encouraging all visitors to purchase just one ticket, a passport that will allow them access into all that can be visited at Versailles. This project is part of a major undertaking with regard to visitor intake and service. The royal gate is going to be reconstructed at Versailles. For those who have already seen it, there is a first gate, but we are going to put in the second one as it stood under Louis XIV. This will enable us to create a space that will be the starting point for the various itineraries. All of the architectural restoration work and projects involving tourism and economics are completely interrelated, which, of course, is only normal.

Another major area we are working on—yesterday Messrs Bun Narith and Ros Borath also mentioned it—is the need to properly control the space, in other words enable all visitors to enjoy the entire site. That brings on problems of transportation, parking, etc. At Versailles, we use a small train, in addition to busses, as well as small golf carts. Bicycles are also available on the site, as well as boats. Where you have water, you have boats, and that adds to pleasure activities that should be available on major tourist sites. When I think of Angkor, I think of course of many possibilities that could be added in this dimension of pleasure, that we discussed with Mrs Chau Sun Kérya when she had us go up for that absolutely fantastic balloon ride over the site. This is something that needs to be taken into consideration in your project that involves controlling the space and allowing visitors to enjoy it.

The third major area that we have to address is reading the site. On both your site and ours, many foreign visitors come who know nothing about it. They've come to visit. We have to give them an introduction, some explanation. That is one thing that name plates do, and I see that Angkor is way ahead of us with name plates on trees. This is very important. At Versailles we distribute folders, we provide guided tours. This enables us to give VIP treatment. Special tours or itineraries can be developed, such as night tours, which are very successful and very interesting.

In Siem Reap / Angkor, compared to Versailles, you have a tremendous hotel infrastructure and something could be worked up with large foreign corporations that would be both productive and interesting. But the bottom line is always to help people better understand the site, and we are going to develop an automatic guide system, included in the entrance ticket, enabling us to introduce and conduct the tour for anyone who comes, giving him or her a full introduction to the place. This is something very important.

Another area is communication, relations with the media. Right now you are on a very popular program in France called ‘Des racines et des ailes’ (Roots and Wings). This is something with very high stakes, as it makes the place international, letting everyone know about its economic and tourism resources. That will lead to own-source income in terms of management of the image. A lot of movies are shot at Versailles, for instance the movie with Sofia Coppola. That is something of immediate benefit, because the place is rented out. There are picture fees, a system of royalties. This is also interesting because you have advertising and a truly exceptional reach.

There is one final area we are working on, that is an entertainment policy. At Versailles, we set up a private branch, and the Public Establishment is the only shareholder in it. This way, we can set up a more ambitious, more profitable entertainment policy. That of course is
something that has to be carried out within the constraints of each venue and each culture. I understand that the religious dimension of Angkor means that certain restrictions would apply, but nevertheless many possibilities exist that are in keeping with the venue, the history.

That outlines a few of the areas in which we are working at Versailles at the present time. We are making a lot of changes to improve visitor intake, improve staff working conditions and bring the place to life. Our slogan is ‘show more’ and ‘show better’. On all of these points, we will be very happy to have interchange with the APSARA National Authority and to share with you our thoughts, the experiments that we’re conducting, to let you know how things are going. I am delighted with the things that this agreement is leading to in a concrete way. I believe it will prove to be a most interesting framework. Provision is made so that any time a written question is raised at Versailles, we answer it as quickly as possible. It also makes provision for expert missions. We recently had the Versailles Chief Gardener come and we are going to have experts come right here and look into all the subjects that I just mentioned. In return, we will be happy to have senior management staff from the ASPARA National Authority come to Versailles to give this cooperation arrangement a human, friendly dimension which is the only way to truly contribute to our mutual understanding and enrich our respective projects.

Let me say that I am very happy with all of this. It is a new step forward in a very old, very deep friendship between the French and Khmer. At Versailles we are very proud and happy to have had some small part in this long history. Thank you for attention.”

III.1.2. Progress Report on the “Angkor Heritage and Sustainable Development” FSP Project, by Mr Michel Verrot, FSP Project Coordinator, France

“I will be very brief and quickly turn the floor over to my colleague and friend Mireille Grubert because what she has to say is much more interesting. I will give you a very short overview of the overall FSP project, which it seems has not been done up to this point. The FSP project was solidified when the funding agreement was signed on September 19, 2005. It has three components, 1) restoration of the Baphuon; 2) continuation of the capacity building program for the APSARA National Authority and its extension to the national elite; and 3) the restoration workshop at the National Museum.

Pascal Royère gave you a progress report yesterday on the Baphuon restoration project. So I will go right way into capacity building and training, which is a two-part component. One of them is strictly institutional capacity building, a continuation of the previous FSP and directed towards the APSARA National Authority. This institutional support is taking place in a number of areas. There is firstly in-depth counseling for the definition of procedures and we have been working for the last few months, in great depth, to achieve coherence in the organizational flowcharts of the various departments, spelling out the particular missions of the technical units of these departments and of course the career paths that go along with them.

But this institutional support also covers support for the routine activities of these departments, in particular continuation of the methodologies and applications on restoration and research work sites. We have had the pleasure of working with an INRAP archaeologist, Mr Eric Llaupis, in APSARA’s preventive archaeology unit. He is here for a two-year stint. Meanwhile, we are resuming the program of having management staff work with APSARA’s technical units so that they get hands-on training and, as the chairperson of the Versailles Institution said, expert missions, which gave us the pleasure of receiving the Versailles Chief Gardener who spent a lot of time on one of our major current concerns—enhancing the presentation of the temples and park landscapes.

The training project that Ms Grubert will detail is being developed at three levels. The first one, of course, is the academic level, and we have been happy for some years now to share in the work supported by Japan through UNESCO at the Royal University of Fine Arts, and we are going to be boosting that involvement. As for skills development that I just mentioned, this
involves professional staff with operators working in the park, either public with the APSARA National Authority or as a spin-off of international assistance arrangements. Then there is the level of specialization, with the establishment of a Center for Heritage Training in Cambodia, which is to be international or at least interregional. Mireille Grubert will fill you in this later. Thank you.”

**III.1.3.1. Establishment of the Center for Heritage Training, by Ms Mireille Grubert, Director of the Centre des Hautes Études de Chaillot, France**

“I am delighted to be with you today to outline this project for a Center for Training in Heritage Trades in Cambodia and to tell you about the Chaillot School of which I am the director in Paris, a school that trains architects who want to specialize in heritage. I will start by telling you about the project in Cambodia, which is why I am here, and I will add a few words about what our school is doing so that you can better understand how it can make a contribution to this project and the overall complex.

The project that Michel Verrot just mentioned is part of component No. 2 of the Priority Solidarity Fund, under the theme ‘Angkor Heritage and Sustainable Development’. That is the context we are looking at. The decision to establish such a center arose subsequent to the report submitted by Mr Métro, one of the previous directors of the Chaillot School, and Mr Favel, who is in charge of the International Affairs Missions, Directorate of Architecture and Heritage, Ministry of Culture, in Paris. Their mission was requested by the French Ministry of Foreign Affairs in 2003. One conclusion of their report was to set up such a training center, given the needs in the areas of specialization and experimentation for professionals working at Angkor as well as in neighboring countries in the field of heritage in general, and most importantly, training for the upcoming generations.

With regard to this training, who will the students be? The students will be professionals already experienced or already working, especially architects but also urban planners and restorers. They will be Cambodian nationals, of course, but the training will also be made available to candidates from Laos and Vietnam. We have just done a preparatory mission in Laos and we hope that another one will take place in the very near future in Vietnam to spell out the project with our stakeholders and colleagues in these countries. How many students? We are looking at about 25 persons, with a basically equivalent quota for each of the countries. As for content, we are looking at a training curriculum focusing on architectural heritage as well as, I insist, urban and landscape heritage. We are hoping to contribute to this chain that makes up heritage holistically speaking, from individual architectural objects to urban and natural settings in the form of the sites themselves, the gardens.

A few words to introduce the content of this training: It involves knowledge acquisition, the ability to inventory things and make a technical analysis of artifacts and sites in view of their protection, routine upkeep and management. Ms Albanel just mentioned two exemplary sites, Angkor and Versailles. We are also interested in building capacity in the area of restoration with a view to reusing buildings and sites. What types of heritage would be involved? Both the ancient heritage and the more recent heritage, such as that of the 20th century. We have to get a grasp of history, the various histories put together, in order to raise awareness among the stakeholders and all the local actors with regard to heritage.

The studies will be arranged in such a way as to focus on learning a method. It is most important, through the combined use of lectures, case studies and exercises, to give the students the ability to acquire methods applicable to very different situations. There will therefore be a combination of academic presentations, conferences and site visits, operating work sites and supervised hands-on work, case studies and project studies. It is important that the curriculum for professionals of this caliber be arranged on the basis of projects that they are implementing. Each student will be assigned a long-term project on a building or site of his or her own choosing.
The program calls for one training session per calendar year, based on 10 one-week sessions spaced out approximately every month or month and a half. Since the students are already working, it is important that they be able to keep their jobs and concentrate the training sessions into one-week periods. An ‘architecture’ field and a field that I will just call an ‘urban’ field for now will enable us to structure the training with five sessions in architecture and five sessions on urban complexes, the first series scheduled for Siem Reap and the second in Phnom Penh, at least to begin with.

The team of trainers we are looking at would be organized as follows: We will look for a pilot teacher in each of the fields. For architecture Pierre-André Lablaude, here present, a UNESCO expert who also teaches at the Chaillot School and Inspector General of Historical Monuments in France, and for the urban part, Mr Alexandre Melissinos, who was with us up to the day before yesterday. He is an architect and urban planner, also a teacher at our school. They will be in charge of steering each of these two fields, both from the standpoint of content and from the standpoint of the work of their fellow teachers. The lectures will be given by recognized specialists from Europe, Asia and elsewhere in the world. The lectures on experiences will be chosen in this instance preferably from local or nearby cases in Southeast Asia, and we will set up a small team of teaching assistants for the supervised practical work, who may be somewhat younger teachers.

Selection will be done in each of the countries, but we will establish common selection criteria so that there is a balance and a measure of homogeneity in the groups. Student evaluation will be based of course on marks obtained during the year for personal work, exercises as well as participation and regular course attendance. A diploma will be issued at the conclusion of the training so that the students can make use of it in their respective career paths. That then sums up what I had to tell you about this upcoming project.

Now a few words about the Chaillot School that has been asked to contribute to setting up this project with the local Cambodian, Laotian and Vietnamese stakeholders. The school has been around for over 120 years in France and it trains architects wishing to specialize in urban and landscape architectural heritage. It came into being at the same time as the Department of Historical Monuments in France and developed in step with the notion of heritage, heritage legislation and the direction taken by the government in charge. The school recently became the ‘training’ department of a new cultural institution that is coming into being in France, the City of Architecture and Heritage, which is now moving into the Palais de Chaillot and is under the jurisdiction of the Ministry of Culture and Communication, Directorate of Architecture and Heritage.

To give you some figures regarding the number of people we train, there is firstly the honors diploma (DSA, diplôme de spécialisation et d’approfondissement) with specialization in ‘architecture and heritage’, which is sought by a group of 70 to 80 students who enroll in our school each year. The next group involves government architects and urban planners who are architects employed in the civil service who passed the entrance exam and who qualify for a year of training after their competition before returning to their government job. We also have cooperation arrangements abroad, that I will speak about in greater detail later on. We are also setting up a series of public courses in the history of architecture and training to meet the needs of supporting partners such as elected representatives or project directors. The honors diploma is offered to architects who already have a degree, and they make up this population of about 70 students that I just mentioned.

The training is taken over two years, with two days of courses every two weeks. A new university session opens each year. The student can prepare for State competitions for postings such as chief architect of historical monuments or State architect and urban planner, architect of buildings in France. It has an architecture stream that focuses on familiarity with built buildings, monuments or more ordinary structures, with the capacity to perform a diagnosis and draw up restoration projects so they can continue to be used in contemporary society.
Here are some examples of work that our students have done: architectural layout of a church building, a Roman chapel in southeastern France. Our focus is heritage, as I mentioned, both monumental as well as routine. The important thing is to identify and maintain an awareness of a continuum between habitat, ordinary buildings and more exceptional buildings, monuments.

Towns and landscapes are dealt with from the standpoint of protected spaces. We have laws to protect large complexes for more than one reason. They include urban sites and natural sites. We encourage the students to develop their ability to study and analyze these spaces, come up with management plans for these complexes and provide advice for contemporary construction work in existing milieus.

Here are some examples of the subjects studied and design plans, notably plans for safeguarding and showcasing, such as in the city of Bayonne, which fall within specific boundaries wherein each building is studied on an individual basis and is designated by a caption indicating whether or not it can be taken down, whether it should be conserved, and providing indications on what is required for the restoration of each of the buildings.

We have foreign cooperation arrangements that involve the countries of Central Europe, the Middle East, China as well as Africa. The courses may be long-term, something like our DSA courses in Paris, or shorter courses, or even workshops that are a venue for exchange between students of our school and students of the concerned countries, as well as expert missions conducted by teachers of our school. An example of cooperation is with the Faculty of Architecture of Damascus, Syria. In it, we have a two-year course in urban planning and the ancient city core, such as an analysis of a neighborhood in Damascus, as well as monument architecture, such as an archeological work site to analyze a building that was recently discovered on the Damascus Faculty of Architecture site and that provides a work assignment for the students. Architectural planning and attempts at interpretation round out the picture. Another example: training missions with the African Heritage School, that is active in the 26 French-speaking countries of Africa, which we are carrying out in cooperation with the Heritage Institute in France when the training involves the subjects of architecture and urban planning.

That gives you a quick overview of the cooperation arrangements abroad that we are involved in. Whether the training is given in France or abroad, we are prompted by the concern that it should focus on an approach to heritage linked to a factor of economic development and of course to tourism, that it associates heritage preservation with improvement of the environment, that heritage plays the role of social cohesion and helps eliminate exclusion, because belonging to a location is one way of improving social cohesion among the persons living there. We also have the issue of heritage and contemporary creation, in other words, how do we build today when we are in an existing site with heritage values in which construction is possible?

In conclusion, our school is proud of a number of events and highlights. Here we have the opening lessons, something that takes place at the start of each new year, here with Henri Gaudin and Patrick Berger, two great, well-known contemporary French architects who have been invited to speak about what heritage means to them in their work as modern-day designers. Henri Gaudin designed the Guimet Museum in Paris, which is a home to Asian art that no doubt some of you are familiar with. And then we have the graduation ceremonies which are important events at which time the school opens up to the outside world.

So there you have an idea of the way in which we can hopefully contribute with you to setting up this big project that we value very highly. I am most happy to work with all of you who would like to have a share in it in the future. I hope that very soon I will be able to show you some pictures as evidence that the project has actually got up and running. Thank you.”
“May I first salute the tremendous amount of work that has been done since the inception of the ICC over ten years ago, as stated yesterday by Mr Azedine Beschaouch, Permanent Secretary of the ICC, and to whom I pay a special tribute on behalf of the French Ministry of Culture and Communication. The French Ministry of Culture is promoting cultural diversity and inviting Cambodian professionals to France. It started back in 1992 when we were alerted by Professor Claude Jacques, here present, and Professor Léon Vandermeersch, Director and Honorary Chairman of the École Française d’Extrême-Orient, about the loss of management-level staff at Angkor. We were able to invite HE Seung Kong, now Deputy Director General of the APSARA National Authority to come and study the French heritage and architectural system.

This training offer was part of an inter-ministerial process led by the Ministry of Foreign Affairs. We then fine-tuned it for Angkor managerial staff at the Tokyo International Conference held on October 13 and 14, 1993, which was attended by Mrs d’Orgeval, representative of the General Directorate for Cultural, Scientific and Technical Relations, and myself. We then decided to focus on giving supervisory staff training in France along with a provision of similar training right on the Angkor site. So that is how it all got started.

In 1993, we made available a French Government Building Architect, Mr Simon, who was later replaced in 1999 by another French Government Building Architect, Mr Michel Verrot, who worked at safeguarding and restoration of the Angkor site and who continues to work as an advisor to the APSARA National Authority under a new FSP.

Several management level officials on the APSARA National Authority were invited to France in 2002, 2003 and 2004 including Mrs Chau Sun Kérya, in charge of cultural tourism, and Mr Tan Sambun, in charge of sustainable development. In addition to this high-caliber training in France for supervisory staff, that generally lasted from 1 to 3 months, we also found it advisable to send in French expert missions commissioned by the Ministry of Foreign Affairs and our embassy. One archeological evaluation mission conducted by Mr Daugas, Inspector General of Archeology, opened the way for the outstanding work being done by archaeologist Mr Jacques Gaucher.

From 1993 to 1999, and I would like to really emphasize this point, at the initiative of Mr Jacques Toubon, then Minister of Culture and Francophony, our Ministry, with its rather limited budget for France’s cultural action, wanted to share in funding activities of the École Française d’Extrême-Orient. I won’t go into detail about the many successive expert missions that were carried out at Angkor, but each of these missions, each of these experiences shared over a period now approaching 15 years, was a tangible contribution to the ICC and activities at Angkor.

I am not a nostalgic person and do not want to dwell only on the past. Ms Grubert and Ms Albanel spoke to you about current projects. Other things are being done with the National Institute of Research for Preventive Archaeology to assist the APSARA National Authority to develop a number of activities on the Angkor site. Student scholarships are being made available in 2007 to pursue the training offer and involve new management level officers from APSARA, especially junior staff. I was also very impressed—it’s been ten years since I’ve attended an ICC meeting—to see the young generation coming on to its own and the quality of these young Cambodians who can express themselves and who will soon join the ranks of a new generation of scientists on the site.
Ladies and Gentlemen, allow me in conclusion to reiterate that our support for cultural activities in Cambodia will continue in 2006, 2007 and 2008. Thank you.”

**Remark by Mr Giovanni Boccardi:** “I would like to take this opportunity to express the full support—I think I can say so on behalf of my colleagues at UNESCO—for this type of initiative, this training program being set up with the Chaillot School. I feel that being associated with field projects is something essential but it has to be rounded out by sound training over time, so I think that this is excellent. Since we are on a World Heritage Site, I think it would be good for the curriculum to include somewhere a module on the World Heritage Convention.”

**Remark by Mr Azedine Beschaouch:** “The essence has been said but here I am taking off my hat as Permanent Secretary. The truth has to be said. For a decade I was Director General of Archaeology in Tunisia. I have seen people who have been trained at the Chaillot School with scholarships provided by France, which highlights the importance of this school. We have right here with us Mr Ros Borath, now head of the APSARA National Authority’s Department of Monuments and Archeology who graduated from the Chaillot School. So a Cambodian and a Tunisian can tell you about this school. As for me, I am so happy that an injustice of history can be corrected. Mr Boiret told me, when he was invited to be on this Committee—unfortunately his health did not allow him to continue—that he came in 1970 to set up something that was to be a forerunner, and then there was this horrible coup d’état that threw Cambodia into unbelievable misery—he only disclosed it 20 years later. He said that they were going to set up a school. So here we have, thanks to the French Ministry of Culture and Ministry of Foreign Affairs, with the embassy, of course, coordinating all of that, you are going to correct an injustice of history.”

**Remark by the French Co-chairman:** “Before giving the floor to the UNESCO Representative, in the presence of HE the Representative of the Ministry of Culture, I wanted to stress that this project for a Center for Heritage Training, one that is very closely linked to the APSARA National Authority as well as to the Royal University of Fine Arts, would no doubt not have been possible without the work done by UNESCO facilitated by trust funds from the Government of Japan, which was instrumental in preparing the Royal University of Fine Arts for this exercise.”

***III.1.4. UNESCO: Point of Information on the RUFA Project, by Mr Teruo Jinnai, Representative of UNESCO in Cambodia***

[OrigE] “The project for national human resources capacity building in Archaeology and Architecture at the Royal University of Fine Arts (RUFA), got underway in 1993, immediately after the inscription of Angkor on the World Heritage List in 1992. So we felt a very strong necessity of human resources development in this domain. Then UNESCO, with very generous support from the Japanese Government, started a form of training project in 1993 for the duration of one year. This project continued up to 2006 with two years of respite.

Thanks to the generous support of the Japanese Government, this was designed initially as a training project but we have many foreign lecturers and this form of training project continued until 1993. But as the situation has changed, we thought it was really necessary to enter another domain, which was institutional development within the university itself. Since 2003, the project has taken a new form and we have requested the university rectorate to implement this project, instead of UNESCO.
As a result of the support given during the past ten years, the project is now built upon existing local human resources. The administration of the project has been gradually decentralized and UNESCO has a coordinating team. At the moment, we have a French Project Coordinator, Valérie Jullien; probably some of us here know her. She is situated at the campus so she is coordinating this project but the project itself is implemented by the university.

[slide] The main component of this project is, we UNESCO, with Japanese funds, support hiring lecturers and also we procure the necessary equipment such as computers and do some repair work on the campus. Also huge effort is given to ICT training, field work as well some administrative and managerial training.

[slide] For this current academic year 2005-2006 the training still continues in languages and other areas as I just mentioned.

The future challenges: The Japanese Government has been very generous in supporting the university for the past 13 years and some day we know that the financial support will stop even though we may receive moral and technical support. This is therefore a very important responsibility for UNESCO and the university as well as the Ministry of Culture. We have to continue this training at academic institutions and since we understand that RUFA is still having financial problems, and in order to maintain these high academic standards, we have to enlarge or extend partnerships with institutions.

Right now we have at the campus the presence of many partners such as France, Germany, Japan and the US and of course national institutions, such as the APSARA National Authority, and we are also expanding relationships on the academic level. We are sending about a dozen students overseas this year. I know the University of Chiang Mai has given two scholarships so the UNESCO project is now financing just air tickets while the scholarship are given to universities. We also know that the University of Tübingen and other universities from Germany are also proposing some scholarships.

So this is a very brief introduction. We are at a final year of the last phase of this project and I would like to extend my gratitude to the Japanese Government for the past assistance and I would like to also seek further assistance. Thank you very much.”

III.1.5. Point of Information on Various Activities of the Center for Khmer Studies in 2005, by Dr Philippe Peycam, Director of the Center for Khmer Studies

[OrigE] “My presentation this year will consist in highlighting a certain number of events which took place at CKS this past year, or which are in preparation.

I would like first to announce that earlier this month, CKS completed the restoration of the Vihear or Prayer Hall of Wat Damnak, in Siem Reap. This is in accordance with the recommendations of the 2003 Paris Conference on the heritage importance of Siem Reap monasteries. The restoration was supervised by CKS architect, Mr Chhim Phet, in collaboration with the monastery authorities. Like a few other major monasteries in the area, Wat Damnak constitutes a very fine example of Cambodian vernacular architecture, at the heart of the city.

Still in Siem Reap, CKS has in the last year been the venue of a number of conferences and workshops, contributing to the intellectual life of the city.
Starting from the second half of 2005, we first organized, in November, an international conference on ‘Water in Mainland Southeast Asia’ in collaboration with the International Institute of Asian Studies in Leiden, Holland, with funding from the Asia-Europe Foundation. This meeting was an opportunity for scholars and specialists on the question of water in Angkor to interact with their regional colleagues, and to further integrate their work within those being undertaken in the region. Representatives of the Mekong River Commission were present, in reference to what was discussed yesterday.

I will not discuss further about the workshop on ‘Interpretation of the Phnom Bakheng’ which was presented yesterday, and which CKS helped organize with APSARA, the World Monuments Fund and Les Amis d’Angkor, only to say that it represented a model which we hope we can repeat with the same partners and possibly others, notably for the Preah Khan site.

Also, in collaboration with the University of Montréal, CKS hosted in January the first conference ever organized on the ‘History of Southeast Asian Medicine’. This meeting brought over 50 scholars from various institutions and countries. At the end, participants attended the formal opening of the EFEO-led archaeological project on Jayavarman VII hospitals which Christophe Pottier presented earlier. I should say that two CKS board members are directly involved in the conception and facilitation of the project, namely Professor Kolata and Professor Rethy Chhem. A Memorandum of Understanding between CKS and EFEO is currently in preparation.

In February, a large international conference entitled ‘Rethinking Mainland Southeast Asia’, was aimed to address issues related to the societies and cultures of the three neighboring countries of Cambodia, Thailand and Vietnam. Over 70 participants from these countries and from the rest of the world presented papers on subjects ranging from changing social patterns to national cultural identities issues. The conference, which is part of our Rockefeller Foundation funded Higher Education support initiative, featured prominently Cambodian participants from the various universities in Phnom Penh. Again, I think this is important because this kind of event contributes to the insertion of Angkor into the broader social and cultural continuum that constitutes Angkor and its region.

At the end of this month, CKS will host the biennial meeting of the Directors of all American Overseas Research Centers—a network of 22 centers of which CKS is a member—in both Phnom Penh and Siem Reap. This network includes prestigious institutions like the American Institute of Indian Studies, the American Academy in Rome and the School of Classical Studies in Athens. Though CKS is just 6 years old, it has been chosen to host this important meeting, a sign of the interest of numerous scholars for Cambodia, and an encouragement for CKS itself.

New CKS publications have recently come out. I would briefly mention one particular volume, which is entitled Cambodian Wooden Architecture, a Disappearing Heritage. This is a bilingual book. It is the result of 3 years of original research, bringing together Cambodian and international architects under the supervision of CKS’s former Deputy Director, François Tainturier. This material, made available in Khmer at a cheap price, can we hope, contributes to set standards in the preservation of this unique heritage. We will provide copies of this book to the APSARA National Authority’s Documentation Center.

I would just mention that CKS is about to begin the translation into Khmer of Milton Osborne’s famous ‘An Introduction to Southeast Asia’, following the success of the translation of the History of Cambodia by David Chandler, last year.

CKS is also involved in providing fellowships. This year, CKS awarded 12 senior fellowships (doctoral and postdoctoral), 7 to American scholars and 5 to French scholars. I am pleased to announce that the Florence Gould Foundation, from New York, will continue to support the program of fellowships aimed at French Junior and Senior Fellows for three more years, in collaboration with the Institut des Langues et Civilisations Orientales.
American scholars continue to receive support from the US Department of State and as far as Cambodians are concerned, we have currently four young Cambodian researchers currently doing an MA program at Chulalongkorn University, Thailand, and Magad University, India. The latter program is the result of a collaboration between CKS and the Government of India. The first CKS-funded graduate, Ms. Tan Sodany has just completed her MA at Chula University.

This year again, we will run our popular Summer Fellowship Program in Siem Reap where 15 young undergraduates – 5 Cambodians, 5 Americans, 5 French – have been selected from a ever wider pool of applicants to come and study and learn about Cambodian culture, language and civilization. This program will take place in Siem Reap. As for last year, I want to convey my thanks on behalf of CKS for the assistance provided by the Department of Tourism at APSARA for access to the temple site.

Briefly about our research project: although this presentation is under the rubric ‘Human Resources’, CKS is also committed to supporting research activities. Of course, it wants to do so by ensuring that Cambodians are at the heart of these research activities. Some of these projects are either directly supported by CKS or they are being developed by some of the Center's institutional consortium members and CKS supports and facilitates these projects.

One of them is the program led by Professor Alan Kolata, from the University of Chicago, itself in cooperation with Professor Michael Bindford, from the University of Florida – also present here – together with other senior researchers. Entitled 'Economic Growth, Social Inequality and Environmental Change in Thailand and Cambodia', this critical pluri-disciplinary research will be presented later this afternoon by Professor Kolata himself.

Another new collaborative research project is the one developed with the New School University in New York, entitled 'Initiating Urban Cultural Studies in Cambodia'. It is an urban ethnography, which currently focuses on a sector of Phnom Penh, namely the Tonle Bassac area but which may be expanded to other cities, including Siem Reap. The methodology is qualitative, field-based and research is conducted by young Cambodian researchers. The project is initiated by Professor Abdou Maliq Simone. In-country research supervision is provided by Dr. Penny Edwards from UC Berkeley. The project has strong potential to inform policies related to urban poor, to heritage, and to the arts, and also to engender other studies, forums, and conferences.

In March 2006, CKS, the Ministry of Culture and Fine Arts and the Royal University of Fine Arts’ Department of Archaeology, have begun a new collaboration under which a Cambodian team of young archaeologists, under the general supervision of HE Professor Son Soubert, will develop an integrated archaeological and conservation project on the pre-Angkorian site of Sre Ampil, 40 kilometers south of Phnom Penh. The project is to continue the groundbreaking capacity building efforts in research leadership in the fields of archaeology and cultural resource management which CKS ran for three years, from 2002 till 2005. The Sre Ampil project will consist in the building of a provincial museum, and the training of the local community in cultural resource management in its first phase. In a second period, it will include archaeological excavation, with the possible collaboration of scholars from the University of Hawaii and the National University of Singapore. The project is led by two Faculty of Archaeology graduates, Mr Phon Kaseka and Phlong Phisit.

I want to mention also a final project research project run by Professor Kamaleswar Bhattacharya who is currently working on the translation into English of the important Sanskrit inscriptions of the temples of East Mebon and Pre Rup, composed in the 10th century under King Rajendravarman. The inscriptions, according to Professor Bhattacharya, are known for being amongst the longest and the most significant poietical and philosophical texts ever found in Sanskrit.

Finally, I should mention here CKS’s involvement at the National Museum of Phnom Penh. This is done in the form of a program of inventorying the reserves of the Museum. The project,
which has been running already for two years, is led by Dr Darryl Collins and has already recorded over 7,000 pieces of bronzes and stone materials. I take this opportunity, on behalf of the participants of the project, to renew our interest and also concerns about the future of the Museum and its collection, which is of great importance for the sustained development of tourism in Phnom Penh. Thank you very much for your attention.”

III.2. Environment

III.2.1. Contribution Regarding Suburban Agriculture in the Siem Reap / Angkor Region, by HE Mr Uk Someth, Deputy Director General of the APSARA National Authority

“The matter that I am going to discuss may not seem particularly relevant to most of you here, but I feel that it is highly meaningful.

Firstly, Mr Beschaouch just told us that he read something linking the fall of Angkor to the destruction of the forests and the water problem. Here, suburban crop growing in the broad meaning of the term is part of our natural heritage. I would like to highlight two things: Why are we talking about suburban agriculture? When the JICA, APSARA National Authority and town of Siem Reap were working together on the Master Plan for the Sustainable Development of Siem Reap, we came to realize that an extremely important thing was being overlooked for one reason or another. That is, despite the growth in tourism, the communities have never seen an improvement in their income. By that I am referring to the rural communities. Why so?

Tourism development is pushing the demand for agricultural produce, but we found out that about 80 percent of it is being imported from the outside. Why can’t we supply all this food necessary for the hospitality industry, the large hotels and restaurants? We then discovered that unfortunately there was no agriculture organization. Secondly, there is a lack of technology. Thirdly, and most importantly, the market study. We did a pre-study of the market and found that there really is a market but it is not being filled. So the question is, what should or shouldn’t be done to fill this market demand?

Based on figures supplied by the Asian Development Bank, agriculture production in the Siem Reap region is about 30 to 35 percent local. But only 10 percent out of the 35 percent is used to meet the needs of the upscale hotel and catering industry. Why? Because it is not up to the standards required by the big hotels. Some points of technology have escaped our rural communities. Much of the agriculture produce supplied by our rural communities falls short in quantity, quality and variety of produce required by the sophisticated hotels and restaurants. This requires closer attention.

Secondly, looking at the broader picture, we also see that many people in rural communities are selling their land and moving into town to work as taxi, tuk-tuk and motorcycle drivers. There is a sort of urban migration, perhaps not so great yet, but a real exodus is starting. It is picking up speed and getting worse. If we could put the brakes on this rural exodus, get people to stay on their land because of enjoying a better income, I feel we would be getting somewhere near a solution.

Thirdly, the environment. Siem Reap is stretching out more and more, in all directions, especially along National Road 6. We don’t want things to go like they have gone, as you can see on the highway from Phnom Penh to Sihanoukville. There’s about forty kilometers from Phnom Penh out past the Pochentong Airport, from Phnom Penh to Kompong Speu province, and it takes
over an hour to drive it. The city is growing in an anisotropic pattern. That means that the human effects of development stretch out along a never-ending axis. We want to avoid that. So the third objective is to break up that pattern and have suburban agriculture meet the demand.

With the permission of HE the Ambassador of the Federal Republic of Germany I am simply pointing out that Germany is very interested in this project and is looking at areas in which it can help implement the project. Thank you for your attention.”

**III.3. Tourism Development**

**III.3.1. Contribution on Tourism Development, by HE Mr Thong Khon, Secretary of State, Cambodian Ministry of Tourism**

“I would like to compliment the APSARA National Authority for all the work it has done in the areas of conservation and tourism development in the Angkor region. By getting ISO 14001 certification for environmental protection, a major strategy in the tourism sustainable development has been put in place.

Tourism in Cambodia involves both culture and nature. The Royal Government of Cambodia, under the enlightened leadership of Prime Minister Samdech HUN Sen, considers tourism as one of the six priorities to develop the economy of the country. Sustainable tourism development is a government policy to reduce poverty and to promote growth in the region. Since 1998, there has been constant economic growth in tourism and in other areas.

Angkor is at the heart of cultural tourism. It is the tourism mecca of Cambodia and is the engine that is driving development in other regions of the country.

International and national visitor numbers have increased from year to year, at a rate as high as 25 to 30 percent for international arrivals. In 2005, the number of tourists reached 1,421,615 countrywide, which is an increase of 34.72 percent compared to 2004. We had 676,809 foreigners come, or 47.6 percent of the total, which is a 20.65 percent jump over 2004. The breakdown is 51 percent in groups and 49 percent as individuals, with some 300,000 nationals visiting Siem Reap.

Total revenue from tourism in 2005 came to some 1,078 million dollars, or over 10 percent of the gross domestic product, and generated some 200,000 jobs.

The conclusions in JICA’s report on the Master Plan for the Sustainable Development of the Siem Reap / Angkor Region highlights tourism as the key economic sector in the future of the country. This challenge should guide implementation of a policy of stable expansion of this sector in order to contribute to one of the Royal Government’s priority policies, poverty reduction.

Tourism in Siem Reap province hinges on **four key pillars:**

1) **Angkor.** In its tourism development mission, the APSARA National Authority should anchor tourism at Angkor with concrete management plans, creating itineraries to control tourist flows and encouraging tourists to stay longer.

In addition to offering new products in terms of things to see and managing the number of people in the monuments, the APSARA National Authority should see to the following aspects of development:

**Human resources development:**
- Constantly improve tour guide services through continuing education,
- Generate employment for local communities by giving priority to local guides to encourage visitors to go out and see the monument surroundings,
- Bring tour guide services up to international standard, i.e. not only provide local area guides, but provide national tour leaders for groups of visitors,
- Arrange for areas where tourists can have their portraits or pictures of temples painted (like the painters of Montmartre in Paris),
- Improve service quality by giving young people more training tourism-related trades, down the line setting up other vocational schools for both guides and other tourist activities.

Other critical services for visitor intake include thorough familiarity with the customers and markets: provide leisure activities as an option to monument tours, set up business establishments and souvenir shops worthy of the Angkor site in the monument approach areas, thus meeting the expectations of visitors from different horizons.

A final most important point to be considered involves restructuring the cost of entrance tickets to the Angkor site. Greater flexibility is needed, such as not making it mandatory to purchase a ticket for consecutive days and thus allow visitors to intermingle temple touring and excursions to other sites in the surrounding area.

Getting private operators and specialists together to discuss this matter would help us give the public and tour operators what they want, while at the same time increasing State revenues.

2) The town. With help from the national budget and international aid, much infrastructure has been developed, including roads, bridges, electricity, clean water, sewers, street lighting, etc. Hotels and other tourist amenities have also increased. There are now 86 hotels with 6,117 rooms, and 2007 is expected to conclude with a total of 102 hotels and 8,583 rooms.

However, Siem Reap is a tourism centerpiece and things have to be done to improve its appearance, such as cleaning up the river, putting in green spaces and walkways in such a way as to highlight the downtown core and colonial charm of the old town. Access roads need to be improved. The streets need to be kept clean and in good repair to resolve traffic problems that are getting worse in the downtown area.

The city also has to offer a culturally oriented nightlife for tourists. Attractions are needed such as aquariums with exotic fish. Souvenir selling must be controlled in the areas of both quality and service. Awareness-raising with regard to the value of the tourism sector must be provided on a continuing basis. ‘Green belts’ are needed to meet the needs of various facets of the tourism industry, such as producing rice, fruit, vegetables, flowers, meat, etc.

3) Around Angkor. Tourism at Angkor must also take the surrounding area into consideration in order to diversify the offer:
- The lake allows access to the fishing villages outside of Phnom Krom or Kompong Khleang or to the flooded forest of Kompong Phluk. Some improvements in the Chong Kneas area would make tourism on the water more attractive.
- Roads to sites like Beng Mealea, Koh Ker and Kulen are a means of enabling visitors to enjoy the beautiful Cambodian countryside.
- A side trip to Anlong Veng is possible, where the former Khmer Rouge headquarters on top of Phnom Dangrek can be visited. The Ministry of Tourism is planning to put a site up on it in memory of the genocide victims.

4) Other regions of Cambodia. When the new arrival terminal at the Siem Reap International Airport is opened, we will have a greater intake capacity for travelers.
Links between Siem Reap and the following regions are being contemplated in order to
develop four major zones:
- Sihanoukville as the year ends, to expand the tourism offer, enabling visitors to enjoy
Cambodia's beach paradise
- Kratie and the northwest region with the freshwater dolphins and ecotourism
- And of course Phnom Penh, the garden city with its charm of yesteryear

Reducing poverty through sustainable tourism development is a policy that is
becoming better understood and largely disseminated in the capital city as well as in rural
communities. Two northwestern provinces, Stung Treng and Rattanakiri, are enjoying the
fruitage of this policy thanks to a loan from the Asian Development Bank. The Royal Government
has set up a government task force for each province to see to tourism development as a major
tool in poverty alleviation.

In conclusion, I would like to inform you that the Ministry of Tourism and the Ministry of
Public Works are in charge of the wastewater treatment and seepage pond project under funding
by the Asian Development Bank to the tune of approximately 8 million dollars. Phase 1 with a
price tag of 3.5 million is now becoming operational and will be followed by Phase 2 worth about
4.5 million dollars.

I would also like to inform you that the World Cultural Exhibition ‘Angkor Gyeongju
2006’ will run for 50 days from November 21, 2006 to January 9, 2007 at the new Exhibition
Center.

Finally, on behalf of the Ministry of Tourism, we are prepared to continue working closely
with the APSARA National Authority, the provincial authorities and other stakeholders, as well as
with the private sector, for the ultimate success of sustainable development of the Siem Reap /
Angkor tourism region. Thank you for your attention.”

III.3.2. Contribution Regarding Tourism Itineraries, by Mme Chau Sun Kérya, Director, Angkor
Tourism Development Department, APSARA National Authority

“I would like to briefly introduce this point and then give the floor to the young people
who have been working on new itineraries and tour routes.

Putting in new tour itineraries on the Angkor site is going to play a major role in managing
tourist flows and getting visitors to stay longer. The existing ‘Petit Circuit’ and ‘Grand Circuit’
routes absolutely have to be diversified. Back in 2004, the Itinerary Unit was created in order to
think things out and implement the new routes.

The need to give existing products a new look is backed up by the conclusions of JICA’s
report on sustainable development of the Siem Reap / Angkor region. Two types of studies were
therefore developed.

First, tourist flow management is something very important within the monuments
themselves, and we decided to see how new itineraries could be developed to decongest
saturated zones and thereby maintain the quality of the visitor experience as well as preserve the
sculptures. We will focus on problems currently confronting Angkor Wat, which we visited first
with Simon Warrack from GACP, Ta Prohm, which was studied from the standpoint of showcasing
the sculptures of the monument under the guidance of the ASI team to round out the picture of
this tree temple, and Banteay Srei, that we will talk to you about today.
Second, getting people to stay longer can only be done by offering new itineraries that are both attractive and diversified. This will contribute to successful implementation of the tourist flow management policy. Thus, two routes or circuits have been finalized and tried out: the walking or bicycle tour around the Angkor Thom moats; the lake tour including the flooded forest and village of Kompong Phluk as outlined at the June 2005 Technical Committee meeting. Some thirty proposals are being studied on a great variety of themes such as chronology of the monuments; Angkorian architecture; the legendary apsara images; the coexistence of various religions; the flora and fauna of the Cambodian countryside; village traditions and customs; arts and crafts, shows, cooking; water and stone; sunset variations; monasteries and their role in the community, etc.

Special attention has been given to introducing non-invasive forms of travel on the new routes in order to encourage environmental protection. Four new routes have been developed: a botanical tour of the Angkor Thom forest; a tour of the villages of Angkor; a walking tour of the Bat Chum, Srah Srang and Pre Rup temples; tours within tours of Banteay Srei temple. Today we have chosen to outline two proposals illustrating two aspects of the studies that have been done. The first involves tours of Banteay Srei temple, and will be presented by You Chantha. The second is the walking tour of Bat Chum, Srah Srang and Pre Rup temples, presented by Yos Chamnan.

**Mr You Chantha**

“I will now show you the tours within the tour of Banteay Srei temple. After studying tourist patterns in the monument, the Swiss team in charge of the Banteay Srei Conservation Project put in the structures necessary to avoid bottlenecks in passageways that all visitors have to go through.

Things did improve, but it was not yet enough given the growing number of visitors. So the DDTA Itinerary Unit made a more thorough study of other ways of spreading out the flows. To suggest alternative ways for visitors to go, we feel it is necessary to point out three important considerations.\[slide\] First, the most interesting points in this temple are the pediments and lintels that depict the Ramayana and Mahabarata epic poems. Second, the saturation zones. Third, the current and most often used itinerary, along with a table showing the peak period—about 9:30 a.m.—the average number of visitors a day for the first quarter of 2005 and 2006. It shows an 18-percent increase.

The new routes proposed are based on the average amount of time visitors have available in the morning, from 35 minutes to an hour and 20 minutes. They leave the entrance in different directions, so they do not have to run into other people at the saturation points. We also came up with a fourth proposal for visitors who want to make a peaceful discovery of the temple and its mysteries, and that means going out in the afternoon when it is not crowded.

All of these itineraries require the active support of tour guides and tour operators, provided of course that the visitor intake facilities are up and running. Internal flow control requires assigning specific times for arrivals, having visitors go off to visit other sites in combination such as Kbal Spean-Banteay Srei; Banteay Srei-Banteay Samre-Pradak village; Beng Mealea-Banteay Srei; or Phnom Kulen-Banteay Srei. Such combined trips can be set up in the morning or afternoon. In any event, the peak 9:30 a.m. period is avoided by visitors who opt for these combination packages.

Flow management problems could be rather quickly resolved if people would come out in the afternoon, which is not a popular time for this temple. And that means countering the prevailing cliché that the temple looks better in the morning light. Thank you.”

**Mr Yos Chamnan**
“I am going to outline the second proposal for an itinerary, the walking tour from Bat Chum to Srah Srang and from Srah Srang to Pre Rup. The teeming crowd on top of Phnom Bakheng at sunset time leads us to propose alternative sites to meet the expectations of visitors who feel their visit to Angkor is incomplete without including this magical time of the day. Sometimes tours are done on a hectic schedule, which takes away from the mysterious charm of the monuments. So we decided to propose a casual walking tour highlighting temples and the basic features of Angkor—water, nature and rice paddies.

[slide] Here are the working methods used to design this route that can be covered in two stages, one from Bat Chum to Srah Srang. It is one kilometer long and takes about 20 minutes. The second goes from Srah Srang to Pre Rup, two kilometers long and taking 30 to 60 minutes.

[slide] Here is the map for our proposed circuit, shown by the red line. The walking tour is best during the green season when it is not so hot. And visitors enjoy some monuments with few people around, along with a look at ancestral farming traditions and picturesque landscapes of the Cambodian countryside while walking through some of the villages scattered throughout Angkor Park. They end their tour with a marvelous sunset over the rice paddies. This proposal needs little to make it work, just putting in some directional signs, information panels and explanatory posters. Visitors can choose the half-day walking tour or the combined one-day tour with two Angkor villages nearby. Another point of this route is that a typical Khmer house will soon be put up by the Department of Monuments and Archeology and made into a small interpretation center on rural living, enabling visitors either when they come to or leave Srah Srang to learn something about the daily life of Khmer farmers. Thank you for your attention.”

Remain by Permanent Secretary: “Before moving on to a recommendation, let me add a thought on a personal note, though I don’t think I’m alone this. Let me say how impressed we are by the maturity of these young people and, since the French language—thank God—is also one of the features of this committee, how impressed I was with the remarkable command of French of these young people. And Mrs Chau Sun Kérya told me that they didn’t speak French when they started. So bravo! It’s reassuring. It shows that we can be even more optimistic about the future. So while commending them, I would like to go on to what HE Mr Thong Khon, Secretary of State for Tourism, so clearly pointed out: tour itineraries have to be diversified.

With the permission of our Co-chairmen, I would like to make a strong recommendation. These itineraries have been around for over two years. I went on them with the APSARA National Authority, with Ms Kérya in particular. Three files were turned over to me, but I personally went to Kompong Phluk a few days ago, to the lake village. I have to say that these places are fabulous and that they absolutely must be showcased as soon as possible, because it will help the local community in the areas of health, hygiene and education. So with your permission and out of conviction, a strong recommendation is in order, and I am sure that HE the Director General, Mr Bun Narith, will be happy about it because he will have the means to carry it out. It is not asking much, but these itineraries should be implemented as quickly as possible. Thank you.”

The French Co-chairman approved the recommendation proposed by the Permanent Secretary and turned the floor over to the next speaker.

III.3.3. Point of Information on the AEON Museum* in Siem Reap, by Mr Yasunuki Furuyama, Sophia University Angkor International Mission, Japan

[OrigE] “We are pleased to inform you that we started our museum construction on May 17, 2006. Now we’re setting up temporary facilities such as site fences, a site office and storage. Also we have started concrete piling. The piling will be finished in June 2006. We will drive 584 piles in total for this museum.

* Tentative name.
We keep in close contact with the APSARA National Authority. Actually we have invited their staff to the construction site to confirm the position of the site fences and buildings. The building construction is scheduled to be finished next May. Then we will put in all the statues to be displayed in the museum. We plan to open the museum in November 2007.

This museum is located along the access road from Siem Reap to the Angkor historic park. It’s just at the edge of zone 2. The lot is 90 m by 180 m. To the north of the site is the new APSARA National Authority headquarters office and transportation center.

AEON and the Sophia University are considering environmental matters. Actually AEON is planting trees in Southeast Asia, including Cambodia. The President of the AEON Corporation, Mr Takuya Okada, wants to have trees planted around this museum. In the future, this museum will be located in a forest. So that is good for the environment and it will also look like the Angkor monuments, enshrouded by the tranquility of the forest.

Many tourists are coming to see the Angkor monuments in Siem Reap. When we have finished this museum, national and international tourists will be able to visit both the monuments and the museum. This museum will provide a good opportunity to show excavated relics and tourists will also be able to visit the excavated site directly. This museum will enhance the understanding of Khmer culture and history. In the museum we will display the 274 Buddha images that the Sophia University Angkor International Mission excavated at the Banteay Kdei temple. 272 pieces are made of stone and there are 2 small bronze figures; 187 pieces represent Buddha protected by the Naga. The heads are separated from the torso for most of them. The stone pillar of 1,000 seated Buddhas will also be displayed in the museum.

The design concept of the museum tentatively includes a space for prayers to the Buddha. Also, we want to make a place where visitors can feel a Cambodian atmosphere, which is not only of artifacts but also of nature and humanity. I hope this museum will be a research center for the Angkor monuments, in collaboration with Cambodians and people from all over the world if possible. Thank you for your attention.”

The French Co-chairman pointed out that the Committee usually heard a presentation from project promoters prior to expressing an opinion and on this backdrop invited representatives of the Sou Ching Company to make a presentation.

III.3.4. Engineering Plan for Night Lighting and “e-ticket” System, Presentation of a Private Project, by Messrs Seo Jeong Tae, Chhoundeth Ros and Yeom Sail, Sou Ching Electronic Co. Ltd.

Mr Seo Jeong Tae

“The Sou Ching Electronic Company signed a contract with APSARA Authority on March 15 of this year, with the desire to increase the number of visitors to the Angkor site area through an innovation of other attractive activities such as the creation of a night lighting system, and a stage for performances on the Angkor site at night time. Also the APSARA National Authority authorized our company to collect fees at night time by using an e-ticket system. Next, Mr Yeom, our Project Manager, is going to present the technical plan for night lighting and the e-ticket system.”

Mr Yeom Sail, Project Coordinator
“We divide our lighting system into two categories. ‘A’ is the road lighting and ‘B’ is monumental lighting. Installation of a lighting system without causing damage to the monuments is our design concept. Therefore, we have been thinking very carefully to protect monuments from digg ing the soil, wiring, installation of devices and also from the lighting heat and brightness. And we also try to do our best to hide artificial equipment from the sight of tourists during the day time.

The second design concept is harmonization with the monuments through colors and stone lamp housings. Our road lighting will begin at the border of the Cultural Expo area and end in front of South Gate. The whole distance is about 14 km. In here we have about 1,150 road lights and each pole is 25 meters apart from the other. The light poles are 4.4 meters in height and we use 125-watt light bulbs. We will turn on the road lights from 6 p.m. to 11 p.m. After completion of the road lighting, visitors will be able to enjoy sightseeing at night time along the road. We will also use this road as a pathway to see the light shows and performances in the Angkor Wat area.

We will install these lights at a careful distance from the monuments and also use a mirror to reduce the light temperature and intensity. Our engineers have already checked the temperature and intensity of the lights. We want to avoid causing any damage or harm to the monuments.

This type uses 1.2-kW light bulbs. During the night show, we will have two entrances and exits. Visitors can enter from the west or from the east side of the temple. The visitors will be able to park their transportation on either side of the temple but we recommend that they park on the existing parking lot on the west side. The performance will start at 7 p.m. and end at 9 p.m. Right now we do not have plans to have performances every night but we will consider it and work with the APSARA National Authority to approve how many times performances can be held there each week. After each performance, we will make sure that the visitors leave the Angkor site. We will try our best to put everything back to normal for the day time visitors.

We will use these kinds of lamp housing to harmonize with the existing monuments. Type A and B are for causeways. Type C is for the bridge of Angkor Thom, Type D is for normal statues and Type E and F are for the outside and inside walls of Angkor Wat. We are going to use special stone colored duct for wiring.

In order not to harm any monuments, we are going to use the existing facilities like water conduits, holes, etc. through a careful site survey. We have done the site survey many times already. We will install the cables and equipment with special care.

This is a simulation of Angkor Wat after the system installation. The color will be changed like this. We are harmonizing with the existing monuments.

This simulation is for the Bayon. The color will be changed automatically according to our software as with the Angkor Wat temple. This site is just for a drive by, with possibly a stop to take pictures in front of the temple.

We will sell e-tickets at night. This is a configuration of the e-ticket system. The process of issuing tickets is very simple and fast. For example, we can issue ten tickets in less than 10 seconds. And the sales data will be transferred to the database servers in order to be stored immediately. We will be prepared for any electricity shut down with UPS and generators.

This picture is a real sample of checking devices. There are a PDA, a ticket reader, an external battery and a waterproof case. The checkpoint men will wear the case around their
neck. This is a sample of an e-ticket pass with a protective plastic case. We recommend that tourists wear them around the neck.”

**Mr Chhoudeth Ros**

[OrigE] “We hope that this project will bring more prosperity to Cambodia. The projection of the number of people visiting the Angkor area at night in year 1 is expected to be 210,000 people and by year 10 the number will increase to 494,252. This 42 percent increase has a great potential for Cambodia. This growth will also bring growth in jobs, foreign and local investment, thus boosting the Cambodian economy. Thank you very much.”

**Remark by Permanent Secretary:** “Obviously just taking a first look at a project like this means we are limited to just what we saw. No study has yet been done by our experts here or any other experts. As far as UNESCO’s role is concerned, if we don’t have experts available here, we will call on international experts. Between Japan, France, Africa and America, we have several experts who can give us some input. At this point we cannot take a position other that stating a warning. And the warning is simple. We have to say something. According to an old proverb, ‘it’s better to say something than nothing’.

First of all, and I sense a similar feeling around me, great attention must be given to putting in lampposts. We don’t want the Angkor forest to become a forest of lampposts. That would be very serious. Secondly, to have lighting, of course, as we just heard, some existing conduits would be used. Some things would be put underground and others would be quite conspicuous. In either case, damage could be caused. The best thing would be to have this file studied out by the APSARA National Authority. Also submit a copy to the experts via your Secretariat, who would be the experts here present or other experts that we could commission with our Co-chairmen. It is not simply a matter of putting in lighting. This is something that involves the future of the Angkor landscape. Similarly for the choice of colors. On a World Heritage Site, great attention is in order. UNESCO, speaking through its Director General rather than through the experts, wrote an official letter, as I recall personally, to the President of the Republic of Egypt to tell him not just any lighting could be put in on the Luxor World Heritage Site. UNESCO’s role in this matter cannot be overlooked. We can’t say that ‘now this is something different from the monuments’. The monuments belong to the Kingdom of Cambodia and globally to the heritage of mankind. So this great civilization must not be distorted by a matter as simple as lighting. No matter what a genius the person is who puts in the lighting, he has to take a look at what is being done worldwide. And what is being done worldwide can correct certain impressions.

So without taking a position for or against, if you agree, we will recommend that the file be studied by the concerned authorities, the APSARA Authority, and your group of experts, both the current ones or others that may be commissioned by UNESCO, and an opinion will be submitted to the Royal Government since the Royal Government realizes that such an opinion will provide a basis for things to be done properly. And I would like to add that I am reassured to some extent by the fact that in keeping with the very clear instructions of the Chairman of the APSARA National Authority, HE Mr Sok An, Mr Bun Narith, the Director General, will proceed as follows: Regardless of the MOU or agreement that he is given, he will let us know, as has been done today. Subsequently, as he just said for the shuttles, a trial period must be allowed to study the impacts; surveys have to be conducted, etc. We can’t speak of a trial period here because anything that is put in is bound to change the landscape and the site. So if you allow, we will write up a recommendation, with the assurance that the APSARA National Authority will follow through very precisely on it.”
The French Co-chairman approved the recommendation put forward by the Permanent Secretary, adding that the pattern of getting an opinion from the ICC experts is consistent with what was done for similar projects in the past.


"I'm a preservation planning specialist, based in the United States. I first came to the ICC meeting in December 2004, because of my deep concern about visitor impact and my strong desire to help you come up with a solution. I want to say thank you to Gadi Mgomezulu who championed my proposal and to Professor Beschaouch for placing it on today’s agenda. Since coming here in December 2004, I have progressed from feasibility to production planning. Seeing the work this morning and hearing Ms Chau Sun’s presentation, I’m extremely hopeful that we can, indeed we must, succeed.

I recently affiliated myself with two companies: Lightroom and Storylab. Both are based in Vancouver, British Columbia. These companies are specialized in audiovisual production and story telling and they are very excited to help me on this plan.

Today Angkor is facing what the press calls a monumental dilemma. The challenges previously facing the site are being addressed through heroic ongoing efforts by the various conservation teams and by the APSARA National Authority. At the same time, a new challenge has emerged which threatens to undermine these efforts and the sustainability of the site. That challenge is the explosion in the number of visitors to Angkor. Mitigating the impact of that explosion requires a solution that engages the visitors, empowering them by sharing our knowledge and understanding of the history and fragility of Angkor. We can make the visitors into stakeholders.

The activities of conservation, restoration and documentation have been tremendous. However, those activities are no match for an inexperienced visitor population that is increasing by double digits every year.

In 1986 there were only 565 visitors to Angkor. Less than 10 years later, that number had grown to 200,000. Within four years, the number doubled again and in 2001, the number doubled again. In 2004, less than 3 years later, the number again doubled. And in 2005, last year, we saw a comparable increase. It is projected that by the year 2010, the numbers of visitors will be upwards of 4 million people. That means the total number of people who have visited the site in the last 20 years will be equal to the number of people visiting it in a single year. I just want to repeat that because it such an outstanding statistic: The number of people who have visited the site in the last 20 years will be equal to the number of visitors in a single year.

Visitor impact is creating an imbalance. The physical wear on the site due to ever increasing numbers of feet shuffling over the stone is just one of the negative impacts of such visitation. People climbing on the ruins without respect or care are another. Crowding at certain temples, at certain times of the days is yet another. Visitor impact need to be managed in order to protect the conservation investment, sustain the site for future generations and provide the area with long term economic benefits.
The number of factors we can’t control far outnumber those we can control, but we do have leverage. That leverage comes from changing human behavior. People want and need direction. In fields ranging from healthcare to hospitality, raising awareness has been a powerful and successful tool.

To change behavior, we have to exceed expectations and add value. The three ways we do that are to provide an enhanced experience, increase visitors’ understanding and raise awareness of fragility. Most of us have been to a hotel where we are asked to consider re-using our towels. Informed of our impact, we have the chance to be part of the solution. This simple request has dramatically reduced phosphates outflows into our oceans. Giving people information allows them to make positive choices and to influence each other, politely termed ‘peer pressure’.

At Ayers Rock, it is most often visitors who admonish each other about not climbing on the monument. Without dictating policy formally, the Uluru web site simply states: ‘The ancestral owners of the land have not closed the climb. They prefer that you—out of education and understanding—choose to respect their law and culture by not climbing’. The result has been a dramatic decrease in the number of people climbing Ayers Rock since 2001.

In much the same way, the APSARA National Authority can influence visitor decisions by providing interpretive experiences that engage, educate and empower visitors with a sense of ownership and personal responsibility. The result would be a significant decrease in the physical wear on the site.

The system I propose uses a combination of off-the-shelf technology and existing site information, similar to the one that we saw this morning at Bayon, to augment reality to a series of animated architectural overlays on the real time view.

[slide] And this is where I get to say: ‘Here is one we made earlier’. When we first installed the unit in Belgium, local people said to us: ‘Ah! Now I finally understand those stones’.

[slide] The viewer is immediately able to comprehend the site without physical intrusion. They are enriched with an understanding of the evolution of the site, at the same time reminded of their collective stewardship, as they chose, or not chose, to explore the site further.

[slide] At Ename, we chose to place the system in a small permanent shelter. At Angkor, a variety of delivery systems is available, including kiosks, shelters, etc. In discussing this idea with then US Ambassador Charles Ray, he suggested the system be made mobile. With the help of Lightroom and Storylab, I’ve created some sketches and renderings of the proposed system. In these sketches, we have placed the system inside a vehicle, which based on yesterday’s discussion could be electric, so that this system can be moved into place daily rather than permanently placed at one site. Another advantage of a vehicle-based system is that it can carry multiple programs, moving from site to site within the park based on visitor numbers or where we’re encouraging exploration of lesser visited sites.

Because of the number of groups visiting, this option accommodates up to 30 people at one time. The system doesn’t replace local guides, rather it enhances their explanations and anecdotes about the ruins while asking visitors to please tread lightly. A sense of collective ownership is achieved. The visitor considers the necessity of physical contact with the site and is encouraged to explore carefully.
The system makes the visitor part of the solution, balancing the equation of tourism and preservation. It may be used at a variety of sites within the park, as part of an overall management plan, or for creating new routes like Ms Chau Sun discussed, thereby distributing visitors throughout the park.

The wins for the site are obvious: a reduction of physical wear, an increase in public safety, a protection of the investment and preservation and a revenue generator for our ongoing efforts.

I’d like to speak a moment on the revenue generation. Because such a variety of languages is spoken at Angkor by the visitors who come here, the system is designed to work with a podcast narration which may be downloaded prior to the visit or accessed at local hotels via the internet for a nominal charge, say a dollar. Revenue generated by these downloads may be used for ongoing conservation efforts and economic benefit for the community. Sustaining the underlying resource, the monuments of Angkor, will allow economic development plans to succeed.

Finally, the visitor wins because his experience is enhanced, he has more informed exploration, he comes away with a sense of ownership and he’s empowered with knowledge. There’s a sense of pride that they leave with, because they’ve done the right thing.

I humbly request that the APSARA National Authority and the members of the ICC work with me to select sites and search the components and program materials from which I can build the prototype. I believe I can achieve this work in one year.

I’m thrilled to have had the chance to present my proposal to you and I will be happy to discuss further if you so chose.”

III.4. Urban Development of the Siem Reap / Angkor Region

III.4.1. Master Plan for Siem Reap Town: Final Presentation and Proposed Procedure for Subsequent Steps, by Mr Tomohiro Ono, Deputy JICA Resident Representative in Cambodia, Japan

[OrigE] “On behalf of JICA Cambodia, I would like to review briefly this Study on the Integrated Master Plan on Sustainable Development of Siem Reap Town which has already been mentioned in the presentations of HE Uk Someth and HE Thong Khon of the Ministry of Tourism and explain about the procedure of the upcoming request survey involving both the Cambodian side and the Japanese side.

This study took place from November 2004 to March 2006, spanning about 17 months, with Professor Nakagawa invited as an advisor to this study. Its objectives were: economic promotion led by tourism in a sustainable way; conserving environment; strengthening institutional capacity.
The implementing agencies together with JICA were Siem Reap Province and the APSARA National Authority. Also, a steering committee at the provincial level was set up for smooth implementation of the study and realization of this Master Plan. Mr Terracol of the *Agence Française de Développement* also had a chance to join this meeting and at the government level, an inter-ministerial meeting was set up for better coordination and sharing information. Also, we should not forget about the stakeholder meeting in Siem Reap for broader participation in the study process. Especially the study team cooperated closely with the Asia-Urbs project, supported by the European Union. I would like to emphasize that the study was the outcome of joint efforts by all the people involved.

The future image of Siem Reap / Angkor town in year 2020 is a beautiful and unique tourist city based on a harmony of Khmer history, arts and nature. We would like to share this basic concept that includes three facets: Quality tourism destination; compact city; environmentally friendly city.

To realize this basic concept, 6 strategies were set up:

1) Invite various types of tourists to increase unit consumption and reduce a relative weight of peak season
2) Give larger share of local products to the tourism market
3) Provide guidance for a compact city with beautiful townscape
4) Promote an environmentally friendly city with sound management system
5) Plan ahead for future demands
6) Streamline institutions and strengthen institutional and financial capacity

The compact city concept leads the expansion to the southeastern side only, for securing the heritage in the northern and western agricultural areas.

The projects proposed in this study for urban development were five. Especially number 1 and number 2, ‘Old Quarter Area improvement project’ and ‘Urban planning capacity building’ are high priorities.

I’ve heard that the Ministry of Land Management has already started some meetings to authorize this land use plan. It is needless to say that enforcing compliance with this land use is very important.

Here are some ideas for the old quarter improvement project to attract the tourists not only to the Angkor heritage but to this town of the heritage site.

The next slide shows some images of the future Siem Reap.

One of the proposed projects and programs was the Angkor Products Promotion Center. The Angkor Products Fair that we held last year proved that local products have potential. The study proposes that the Angkor Products Promotion Center strengthen the connection of these local products to the market by first strengthening information support.

One of the issues that everyone is aware of is the water resources of this town. This is an overview of the potential of water resources in the Siem Reap region. In this study, the
Tonle Sap Lake has a high potential for water supply in the long term. This is the study team’s analysis of the required water supply and production capacity. The new water treatment plant granted by the Japanese Government has started its operation in 2005 but still, in the long term, we have to look for—and find—new water resources.

One of the high priority projects was the strategic study on integrated water resources management for the river basins of Siem Reap and Roluos. We already know that we no longer can depend on groundwater so we have to have a big study about integrated water resources management in the river basins.

One of the points we want to highlight is about the establishment of a development committee for project approval: this institutional and financial arrangement has to be made. We’d like to propose that all proposed development projects, not only the project by our study, but all projects whether public or private, must be validated by this development committee which is composed of the members of each department with of course the provincial government of Siem Reap and the APSARA National Authority, inviting resource persons, private sector entities and international donors to sit in an advisory capacity. At this moment, nobody knows who approves such various projects and suddenly a hotel has gone up, something new in town comes on the scene, so city activities are escaping control. Therefore a transparent procedure is needed and we propose this kind of system.

These are the wrap ups for the priority projects that are proposed in the study. There are a total of 13, some of which I have already mentioned.

For the next procedure, the Japanese and Cambodian sides are preparing a request survey for the Japanese fiscal year 2007. This is a tentative schedule. It’s been held once a year and we are waiting for the official request from these 13 priority projects. We are starting the plenary session on June 22, this will be the explanation for this procedure. Then by July 6 we’ll be receiving the concept papers for each project and some examination or evaluation will be held. Finally the most promising projects will be sent to Tokyo. This is only a tentative schedule and we’re waiting for Mr Takahashi to approve this procedure.

The next slide shows the contact point for this procedure, and the Council for the Development of Cambodia is in charge. So we would like the Cambodian side to discuss carefully and arrive at a consensus regarding which project they are going to request from the Japanese side. Also, the Japanese cannot do every project so, after this request survey, we would like to coordinate with all the other donors, all the other stakeholders, on how to move forward with this integrated Master Plan. Thank you very much for your attention.”

The French Co-chairman responded to the presentation made by the Deputy JICA Resident Representative by stressing the need to see that the water supply keeps up with the growing demand.

**III.4.2. Progress Report on Studies Relating to Water Supply in the Siem Reap Region, by HE Mr Uk Someth, Deputy Director General, APSARA National Authority**

“Mr Ono has presented the problem in global manner, I’d just like to focus on the issue of water. I think up to now, we’re all convinced that water is one of the main problems that
could be an obstacle to development. To develop sustainably, we have to have water. And now, we're confronted with this problem. And if this problem continues as it is, we're going to face this problem in a very crucial way.

I think it’s much better to provide figures and photos so I will limit my intervention and explanations. In this figure you see three things: the demand, the production and then the population demand. This, put in the equation, means that now we're facing a water supply shortage problem. Due to this problem of shortage of water supply, even with this project that’s just been completed by JICA that provides up to 8,000 cubic meters a day, it would not be sufficient. According to the survey, we know that the population of Siem Reap and the hotel industry currently use 16,000 cubic meters a day. So we have about a 100-percent shortfall. This shows that there is an existing wide gap of water supply in Siem Reap.

This is a tentative plan of how we can face the water problem. You see the problem of supply and the problem of demand. It illustrates the shortage between now to year 2010. But if we can enhance this project, it will ease the problem of water even though there will not be full coverage of the population using the water supply. We have enough to meet the demand at the same time for population use and also for industries.

Now the resource that we’re pumping is underground water, which is the only intake water. It will be a very big problem because the water table is going to be lower and lower due to the change of climate, due to pollution and then the demand is going to increase more and more. The estimate of water pumped now each day is more than what is recommended. It’s recommended by the study of JICA that we do not pump more water from underground than enough because 8,000 cubic meters is supposed to be the threshold of the water you can pump without causing damage to the temples and without polluting the underground water. So this figure shows you what the situation is now and I’m afraid that this situation will continue in the years to come.

We’re taking the source of water from underground, as I mentioned. There is another source of water that we can look to at Phnom Kulen. But unfortunately, the destruction of forests is causing degradation of the environment and is having a very negative impact on the rainfall and also on the microclimate.

You see the water is going lower and lower. This is the reason why most of the canals and the hydraulic network cannot easily fill up the West Baray and other large basins. And sometimes, due to the fact that most of the canal has been used for other purposes, I think that this water will flood around the Siem Reap city almost every year.

This is what I call damage caused to the existing network by not having enough maintenance or by negligence or by using the canal for other purposes.

This is a tentative projection that could be interesting: This is the capacity of the West Baray from year to year. The water level is getting lower and lower, the capacity diminishes and if we suppose that the rate of the capacity of water continues in the same trend, without any outside factors, the Baray will dry out completely in 2015. This is one of the reasons why we should be aware of this question. Suppose that the West Baray dries out from 2006 to 2020. If there is no appropriate measure taken now and if this Baray does dry out, what will become of
the project for the green belt? What will become of the project for the agricultural zone? And what will become of the project to supply water to the Siem Reap area?

[slide] There will also be a negative impact on the environment. You see on the photo what the situation of the Baray is. This is what we call sedimentation of a whole part of the West Baray. The eastern part of the West Baray is covered up to almost 30 or 40 percent of the water surface.

This leads us to ask ourselves two questions: Can we develop the Siem Reap region in a proper, sustainable way without water? If there was no water, could Siem Reap be the spearhead of economic development for the whole country? I leave the question with you and invite your answer today. Thank you very much.”

The French Co-chairman supported HE Mr Uk Someth’s presentation by adding that resolving the differential between the supply and the demand is a crucial problem in terms of sustainable development as it will be a major constraint to tourism development and the general development of the Siem Reap region. He encouraged support for the project to study problems relating to water resources allocation.

**III.5. Community Development**

III.5.1. Public Relations and Project for a Khmer Habitat Interpretation Center, by Mr Khuon Khun Neay, Director, Department of Monuments and Archeology 2 (DMA-2), APSARA National Authority

“Angkor is considered to be a living site, and for this reason the Government has made some very firm commitments. Starting with the first decree in 1994, provision was made to preserve all the ancient villages in the protected site. And in 2004, a decision of the Royal Government stipulates that ‘citizens who have resided in these zones (1 and 2) for a long time are authorized to keep their domicile in it, without being forced to abandon their residence’.

Initially we were confronted with many difficulties as we had just come out from a protracted period of war. The APSARA National Authority was established in 1995 and was given the job of ensuring safety on the site and conservation of the monuments. Despite a crying lack of resources, the APSARA National Authority was nevertheless rewarded for its efforts by seeing the Angkor site taken off the List of World Heritage in Danger in April 2004.

The Paris Conference in November 2003 entrusted new missions to the APSARA National Authority, linking ongoing conservation efforts with sustainable development, and that has become the APSARA National Authority’s development Phase 2.

In 2004, the APSARA National Authority restructured itself organizationally, which led to the establishing of several new departments: Joint Intervention Unit, Department of Water and Forestry, Department of Population and Development and Department of Monuments and Archeology 2 (DMA-2). These four units specialize in public relations and sustainable development.

Some measures taken are permanent in nature, such as the Department of Water and Forestry. As its name indicates, this department cares for water resources and forestry management. The department did upkeep work on old canals to bring water into the ancient moats and to allow villages to put in a second rice crop or develop other produce such as...
watermelons, cucumbers, etc. The department started a tree nursery and put in a composting system using leaves collected in Angkor Park. The tree nursery will produce saplings for park reforestation as well as for community and school ground use. [slide] Here is a ‘Forest Day’ event supported by APSARA National Authority staff and people from the local communities, elsewhere in the province and even some Buddhist monks. The growing trees need to be cared for.

The **Population and Development Department** cares for such things as population census and introduction of agriculture techniques. [slide] This is the census taken in 2005. The park has five districts, 19 communes and 102 villages, with a population figure approaching 100,000 inhabitants at the present time. This department also provided training for the people to do composting in their villages. All five districts receive assistance from a professional agriculturist to help the people apply techniques of rice growing, fertilizer use, etc. The last harvest had very good yields.

The **Department of Monuments and Archeology 2 (DMA-2)** cares for matters relating to land use, management of the overall built environment, as well as management of the local communities. We produced legislation, brochures and folders to communicate with the people and inform them of their rights and duties as persons living in protected zones. We started up a free consultation service for the communities and Buddhist clergy, as the latter are involved in putting up new structures in pagoda compounds. We held a seminar for them in November 2005, chaired by His Holiness the Supreme Patriarch of the Buddhist clergy.

Up to this point I have been talking about the ongoing measures taken by the National Authority through a restructuring of its departments. Sometimes special opportunities arise. A communication unit was created at headquarters level to work on boundary definition of the zones, put up signage in the park showing the zones and land use in them and give information to the people living in the park regarding their rights and duties as park residents. Two free telephone lines were put in to encourage dialogue with the people, as well as letter boxes to get feedback from them.

Communication is also done through trainer training focusing first on the APSARA National Authority staff, the Heritage Police Unit and provincial police. Community awareness-raising campaigns are also conducted for students, Buddhist monks and villagers in the protected zones. [slide] Here is a picture of a briefing session for police officers, as well as upper and lower secondary school students and even primary school pupils. We are continuing to provide information sessions and community education for Buddhist monks, even at large Buddhist events.

Population: Up until late 2005, the communication unit from headquarters visited the 102 villages. All villages were visited and received explanations regarding their rights and duties. Here is a meeting of the community with their deputy. The APSARA National Authority was on hand to provide information. When the APSARA National Authority representatives visited the villages, small gifts were passed out to one and all.

Contact is not restricted to the communities, but the APSARA National Authority also works through the projects. We have the ‘Living with Heritage Project’ in association with the University of Sydney. Representatives of the APSARA Authority and the University of Sydney, as well as a deputy, representatives of the monks, village chiefs, tour operators, etc. are on the board of directors or steering committee. [slide] Here we have a discussion going on about the **Phnom Bakheng interpretation project** to which community representatives and members of the Buddhist clergy were invited.

A few words about the interpretation center. You perhaps saw the scale model outside. A piece of land next to Srah Srang was selected. It is bordered on one side by the existing WC facilities and the other by what will become the Srah Srang approach area.
An archeological study of the site was done by the Department of Monuments and Archaeology. It was found that the site was one time home to a very ancient burial place at a depth of over 2 meters.

The project to set up this center has been planned so that the historical relics are not damaged or disturbed in any way. The topography of the land will not be changed. The house will be constructed on stilts rather than on a foundation. This is a non-invasive or reversible construction. The septic tank will be only one meter deep and the fish pond will not be deeper than a meter and a half. All digging will be done by hand under the supervision of archaeologists.

This will provide a good example showing that the coexistence between a development project and preservation of historical and archeological remains is possible. The development project can be used to showcase historical and archeological finds, but it requires impact studies and precautions prior to, during and after the work. This gives real meaning to the slogan 'Conserve for better development and develop for better conservation.'

Here is another example, at the Puok golf course. An ancient bridge was preserved and is showcased right on the golf course itself.

To carry out this project, the Department of Monuments and Archeology made up a special team to conduct research and studies and made a precise survey of Bakong village. This village has been less affected by pressure from tourism and has therefore maintained its traditional Khmer character. The information gathered will be put to good use by the project.

This is a typical house in Bakong village with its haystack and vegetables being grown all around the house.

The project includes putting up a Khmer-style house and fitting it with an exhibition on traditional housing types. One corner will be set aside to display the history of the site and pictures of the excavations. The special utensils and implements used in the house will also be displayed, including rice cookers that take less firewood or use other sources of renewable energy. The house will be an information center and a real showroom of things having to do with Khmer habitat.

The house will have a vegetable garden around it, similar to what can be seen in Khmer villages. The only difference is in the types of vegetables grown. Instead of local produce we will be putting in some Western vegetables that can be grown to meet the needs of international restaurants and hotels. Organic vegetable growing will be highlighted, as well as composting.

It's all very well to talk about these vegetables and the money the villages can make if they grow them, but the people will not understand it or believe it unless they can see it with their own eyes. If the villagers want to grow them but don't know where to get seed, the APSARA National Authority will be able to provide them at cost price. If they don't know how to grow them, ANA technicians will go to their homes and show them. If they don't know how to do composting, our technicians can go out to the villages and show them how. If the villagers can't locate slow combustion stoves or water filters to have clean water, the APSARA National Authority can give them addresses where they can go, or better yet, sell this type of equipment right at the center.

A fish pond will also be put in on the center property. If the villagers want to raise fish on their land, the APSARA Authority can provide technicians to go into the villages and teach the people how to raise fish.

In conclusion, the center will be fenced off by a living hedge of bushes or trees that produce flowers and edible fruit, as well as firewood. These hedges will replace the current fences made of concrete or wood posts and barbed wire that look more like a prison. Hedges like this can be another source of income for the family, an effective way to prevent deforestation and at
the same time beautify the house. We will then have a contest to select the greenest house or the one with the most flowers. Prizes will be given out as an incentive. Angkor Park will really become a flower park!

Once all these things are done, ecotourism can come on its own. ‘New wave’ tourists can visit the villages and why not stay with the people, creating an opening for a home stay program in Angkor Park.

These are immediate measures to help villagers improve their standard of living and alleviate poverty. When people living in the park reach an acceptable standard of living, they will not be so prone to sell their land. They will see the value of heritage and be willingly to share in preserving the park in symbiosis with the APSARA National Authority. Now we’re really talking sustainable development!

Once all of these programs are up and running, the Angkor site will be worthy of being called a ‘living historical site’. Thank you.”

III.5.2. APSARA-NZAID Cooperation Project: Presentation by HE Mr Uk Someth, Deputy Director General, APSARA National Authority, and Project Overview, by Ms Lynn De Silva, NZAID Representative

“A month ago, the APSARA National Authority signed an MOU with New Zealand Aid. This MOU will allow us to implement the project that we call the ‘Angkor Management and Community Development Project’. This will start very soon and this project, we think, will have a positive impact in the future. So I’m going to give the floor to Ms Lynn De Silva who’s here representing the New Zealand office in Bangkok.”

Ms Lynn De Silva

“It’s my pleasure to be here today and provide some brief comments on the main characteristics of the 5-year Angkor Management Plan and Community Project that NZAID is assisting APSARA with.

At the last ICC Meeting, NZAID gave a detailed introduction on its interests in Angkor and its plans for the future, particularly in assisting the APSARA Authority with its intention to establish a living museum.

I am glad to advise that we have now started that process. In November last year NZAID signed a Letter of Intention with the Royal Government of Cambodia and in April this year a funding arrangement was signed with the APSARA National Authority to start the first phase of the Angkor Management Plan Project. My brief presentation today will concentrate on the main characteristics of the project. Essentially the project has 4 main characteristics, namely:

- A well integrated and sustainable park management plan that introduces the practical principles of co-management between the government and the local communities in and around the park.
- The project will also act as a catalyst for increased social and economic empowerment and livelihood improvement choices for the poor local communities. It will provide support to APSARA and the park’s local communities to plan and implement, over a five-year period, community development and environmental initiatives that would help the communities to take advantage of the new opportunities presented.
- Thirdly, the facilitation of the establishment of the required legislation and regulatory framework to secure the co-management agenda.
- The project will be implemented in two stages. The first stage involves the preparation of an implementation plan over a seven-month period and second stage is the project
implementation over a five-year period. The implementation phase itself will be undertaken in two phases. During the first two years, experts will be hired to work with local APSARA Authority staff and local communities to establish the operational guidelines, the training facilities, information program and other relevant activities that would ensure a sustainable operation. Over the next three years the numbers of local communities engaged in the project will be expanded and management responsibilities will be devolved to the local staff.

Let me briefly expand on the four essential characteristics of the project and the planning processes to achieve these.

The establishment of a **well integrated and sustainable management plan** that introduces the **principles of co-management between government and the communities** requires the participation of the local communities, key stakeholders and the APSARA National Authority. An independent consultant has been selected by the APSARA National Authority to facilitate the planning process over the next seven months. At the end of this process an integrated management plan will be drafted and signed. This plan will include detailed programs for community development and viable environment management initiatives with the view to achieving sustainable management of the park.

It is essential in this process that the local communities and the key stakeholders are not only identified but also empowered to participate fully in the management process. Sustainable development of the park region, in our view, can only be achieved if there is true ownership of the decision-making process by the **key** stakeholders. It is not easy to achieve but every effort has to be made to ensure that the principles are embedded over the next five years when the project is implemented.

It is also the intention of this project through a well thought-out **community development initiatives and empowerment program** to provide a wider range of livelihood choices to the poor local communities. The project would hopefully also act as the catalyst for other providers/donors in the region to link up with the project and provide supplementary activities that are in line with meeting the social and economic objectives for the Angkor Park region for the local communities. It is envisaged that during the implementation phase, a local social development expert would be engaged to provide the necessary advice and training programs to empower the poor local communities to participate fully in the park’s development processes.

**NZAID would also seek to encourage synergies to be established between activities identified by the local communities in the park region and other NZAID, or for that matter other relevant donor activities undertaken in the Siem Reap region. NZAID is keen to promote a holistic approach to addressing the interests of both local communities and the Government to ensure maximum access and sustainable use of resources for the poor and opportunities to generate income, employment opportunities and access to markets for local goods.**

For the concept of co-management of the park to be truly embedded and recognized, the APSARA National Authority has the responsibility of facilitating and ensuring that the relevant legislation and regulatory framework is established. The management plan facilitated by the independent consultant would ensure that steps are outlined in the plan for these to be secured in a timely fashion. The long-term objective of co-management is to assist with the promotion of good governance, develop partnerships with stakeholders, build capacity and enhance growth and employment, all of which fits with the Rectangular Strategy and the Nation’s Strategic Development Plan of the Royal Government of Cambodia.

In addition, during the implementation stage, it is envisaged that every effort would be made to select the **right** type of experts with local knowledge and development skills to guide the project in the first two years of its life. This is crucial if the project is to achieve viable outcomes. It is also envisaged that monitoring and risks management would be an integral part
of the project. And the APSARA National Authority will continue to seek independent advice from all relevant agencies.

In conclusion, I would like to express NZAID’s appreciation to this forum for the important coordinating role it performs and we look forward to a fruitful engagement with the APSARA National Authority. Thank you for your attention.”

III.5.3. Rural Community Socio-economic Research Program by the University of Chicago, by Professor Alan Kolata, University of Chicago, and Professor Michael Binford, University of Florida

“[OrigE] My colleagues and I are delighted to have this opportunity to describe our research objectives and activities and in particular to express our appreciation to the leadership of the APSARA National Authority for their confidence in the importance and utility of this research.

A tangible sign of this confidence is the new MOU that will be signed between the University of Chicago and the APSARA National Authority, this week. By the terms of this MOU and in recognition of the critical importance to Cambodia of social, economic, cultural and environmental research of the highest international standards, the APSARA National Authority anticipated the creation of a research cluster focused on issues of poverty alleviation, sustainable academic development and renewable use and management of natural resources, particularly the critical water resources that underpin the region’s economy as so urgently described by HE Uk Someth.

Cambodia’s strategic location and intensive economic and social interaction with neighboring countries in Southeast Asia require the activities of this research cluster be explicitly regionally scoped. The University of Chicago will collaborate in the conceptualization, design and development of this research cluster by facilitating sharing of information on research design, methodology and implementation through consultation by Faculty members and research teams, workshops and defined collaborative research programs. The University of Chicago will participate with the APSARA National Authority in capacity building of Cambodian nationals in disciplines of the social sciences such as economics, sociology, demography and anthropology as well as in the natural sciences. The ultimate objective is to create an enduring partnership that will stimulate research and educational collaboration between the APSARA National Authority and the University of Chicago for the mutual benefit of the two institutions and most importantly for the people of Cambodia.

What then are the research objectives, activities and preliminary results of the research that the University of Chicago, in collaboration with our consortium partner, the University of Florida, has pursued? Globally, studies of low income world economies show that very ability in household wealth and potential for income growth is much larger than economic factors alone can explain. In 2005, our research team began a long-term social economic and environment study in four provinces of Northwest Cambodia to examine the social and ecological factors that promote accumulation of wealth, effective management of national resources and sustainable economic development.

The Cambodian study is a central element of a regional research program that has the primary objective of understanding changing social economic and ecological systems in both Cambodia and Thailand. The key objectives of our Cambodian based study are three fold. First, to implement a large scale socio-economic survey that includes detailed information on household income, consumption, labor supply, assets and multiple other social variables. Second, to implement a comprehensive environmental analysis that will document changes and land use and intensification in Northwestern Cambodia. And third, to combine the analysis of social, economic and environmental factors to answer the question of how and to what extent ecological and social variability affects village economic behavior and decision-making. In 2005, the
A household survey was inaugurated in four provinces in Northwestern Cambodia, namely Kompong Thom, Siem Reap, Oddar Meanchey and Battambang.

In the first phase of the research, 16 households and each of 64 villages were surveyed along with one key informant per village, normally the village headman. A second phase of the data collection began in May 2006. This base will increase the number of households surveyed to 45 in each of 64 villages for a total of 2,880 surveyed households, the largest such database not simply in Cambodia but also in the Southeast Asian region including our type based research.

Data entry and analysis of this large scale data set on household income, consumption, education levels, social networks and other social variables will continue for the foreseeable future and a third phase of household survey and a longer term ethnographic component will be inaugurated in March 2007. At this point I want to acknowledge the extraordinary work of our Khmer base research team who have done this research under very difficult field circumstances and in fact, as we speak, are now in Battambang pursuing this research.

In the brief time remaining I will ask my colleague Professor Michael Binford of the University of Florida to discuss some very preliminary results of the second principal objective of our research which is the analysis of land use and environmental change in these provinces.”

**Professor Michael Binford**

"We have two major early results from the study that we were doing on land use decisions which were certainly culturally made within economic context. But how people make land-use decisions in an economic arena in a variable environment is something very important. We use time sequences of satellite imagery to look at land cover change over time as a proxy for land use. The study area is cross boundary in this case in Northern Cambodia and Southern Thailand.

This is an image of the land covered with the three years of change. Over time, you can see that there is a lot of forest loss on the Cambodian side, the southern side of the image, and there’s a lot of development of reservoirs in the northern half of the image which is the Thai side. The amount of forest in that particular segment of land decreases by more than half on the Cambodian side.

This image, though, shows something else. It’s a changed image of a vegetation index and it indicates the productivity of the land. All the little white dots in the upper part of the left hand side are small reservoirs that were built in Thailand between 1990 and 2000. You can see that a number of small reservoirs are built. This is very interesting in light of the earlier paper that was done by Dr Surat Lertlum who showed us a lot of small reservoirs along the royal road. Perhaps Thailand learned something from Cambodia in the old days.

The reason that we think that those reservoirs were built is that in this variable environment the growing season is much shorter in dryer years. There’s still plenty of water that falls but holding the water back in the reservoirs allows people to have water at either end of the wet monsoon season which in some cases in Northeast Thailand has allowed people to even get two crops of rice off instead of the standard one. In the center valley of Thailand, we see all kinds of rice crops.

The perspective that our study is taking is that of the full landscape in the upper region, taking the landscape down to the individual field plot that’s run by households. We’re doing all sorts of studies including questions of soil fertility, questions of water availability, modeling the climate variability and seeing how that’s changing people’s land use decisions.”

**Professor Alan Kolata**
I would just briefly conclude to say that we anticipate and certainly hope that the research project will identify the ecological and socio-economic bases of land use, land conversion and natural sustainability in Cambodia and that this very basic research which is fundamentally a basic research project will contribute, be useful to planning and managing the context of economic development and natural resources exploitation that may occur in Cambodia, in the future, in the global context. Thank you very much.

**DISCUSSION**

*Remark by Mr Azedine Beschaouch:* “With the agreement of our Co-chairman, I have been taking down the relevant recommendations and we have got them altogether. In a short time I will discuss them with all my colleagues on the Secretariat. However, it seems that we should have a very important recommendation on water. This is under international funding, so may I ask your permission to ask Mr Ono what type of recommendation he would like, as he expressed some ideas, something for the attention of the APSARA National Authority and Royal Government. And could HE Mr Uk Someth tell us what he would like by way of a recommendation. Since these recommendations involve very large sums of money, I don't want them to read either too vaguely or ask too much of them.”

*Reply from Mr Tomohiro Ono:* “I would like to have written in the recommendation that all the related organization authorities should work together about this water issue because in the past, unfortunately, frankly speaking, there was some criticizing about the methods of our analysis of the water issues. So some people said this method was okay and the groundwater and security of the Angkor heritage is okay, but on the other hand some people said that the method was not good so there would be some problems in the future for the Angkor heritage. So we have to work together in order not to allow this kind of criticism. And we want everyone to have the responsibility to express some opinions about this water issue. So if that can be written in that recommendation, we want all concerned authorities to have something like a working group in this water issue to move forward.”

*Remark by Mr Yoshinori Iwasaki:* “We’ve been working for more than 12 years in terms of geotechnical engineering. Mr Ono’s comments are very welcome. I was saying that in the Angkor plain, from Mount Kulen to the Tonle Sap, the height difference is 50 meters. The distance is 50 kilometers so the inclination is 1 to 1000: almost nothing. So just think about the horizontal plane: there is the water. And if you take the water out, what do you expect? The water table comes down from the center of the pumping station. What I’m saying is that in this region, the highest zone is 50 meters above the Tonle Sap Lake. This whole region is just horizontal ground. We have pumping stations around here and those red spots are archaeological points, and here Angkor Wat. The distance from the pumping stations is 5 kilometers. So what happens is if we take 1,000 tons of water? The water table just goes down. Then, in the early period, the water drawdown is concentrated around here, say in a 1-kilometer radius. However, in the long term, up to 20 years, the gradually depleted area spreads outwards. So this is only a very simple assumption. I assume the whole area is uniform. However, there should be some river where water is probably more available. So from now on we need to monitor how the water level changes with time.

In 5 to 10 years, I think there will be no problems around those important areas. However, if we look ahead 10 to 20 or even 30 years, the area will become just like Bangkok. At this moment, what I think we should do is install the points of monitoring stations closely to
these station areas and in various directions and just consider which kind of simulation model better explains the monitoring results. And probably, within 5 or 10 years, we'll have to follow different reactions. At the same time, the JICA has already installed some monitoring points but I don't know in which areas exactly. So please, Mr Ono, let me know. Let's go together. Thank you."

**Remark by HE Mr Uk Someth:** "The problem is persisting. It's not only serious but in the years to come, it will become very crucial and then catastrophic. Indeed, how could we solve the problem of economic development without water? This is the main problem. What we should do, and I wish that this be put in the recommendation: We are now facing a critical problem. We wish that the Royal Government of Cambodia put this as a high-priority project.

Second, due to the fact that we cannot pump water out of the ground without facing crucial risks to the stability of the monuments, we suggest that the new project should diversify the sources of intake water. It could have the possibility of having surface water. If we have surface water, the crucial thing to do is how we could protect Phnom Kulen because it's the main source of water. This would mean maybe reforestation, protection from the destruction of nature so we can increase again the rainfall quality for this area.

Third, we should start immediately to put the project into implementation. From now on to the time we get the first drop of water, it will take at least two or three years. What will be the limit of the development? If development takes place at the same speed, at the same high degree, we'll be facing more and more problems. This is why this project should be started now.

No matter how large the project, the first crucial solution is the possibility of knowing the gap between supply and demand. First solution: the possibility of having to protect the entire environment and to recreate the microclimate without forgetting the possibility in the long term of using the Tonle Sap as the main intake water source, maybe not yet, maybe in 10 or 20 years. This is the main source of potential economic development in the future, without which I do not know how we can achieve what can be called sustainable development."

**Remark by the Permanent Secretary:** "I thank both Mr Ono and HE Mr Uk Someth. What I say is under their control, of course, but I have a recommendation for you and tomorrow all of our colleagues present here will have the opportunity of approving these recommendations. If we merge the two remarks and more importantly the two presentations we just heard, the recommendation could read as follows: Firstly, it is recommended that the APSARA National Authority in particular and the Cambodian authorities in general, given that several ministries are involved, consider the water problem as a top priority in the Angkor / Siem Reap zone, for the communities, for tourism and for agriculture.

Secondly, as expressed in particular by JICA, that all the concerned ministries and departments coordinate their interventions and pool their analytical thinking, because if I understood correctly, there is not so much a problem of friction, but some differences of opinion have surfaced regarding projects put forward. I think that you will agree that we should say there should be a pooling of ideas and coordination on the part of the Cambodian authorities who are concerned by this serious problem.

Thirdly, add that, in the light of the JICA study and as stressed by HE Uk Someth, additional water supplies need to be looked for. Indeed, the JICA study pointed out very frankly that the water supply is not adequate for the whole town or the Angkor site or beyond, but only for a third of the population, the most disadvantaged, on the east side of town, if I understood correctly. And when saying that there is a need to look for other water supplies as quickly as
possible so as to avoid a dry-out, we are not taking a position by stating ‘the Tonle Sap or other’. That’s up to the Government. We will just say to look for other sources of water as quickly as possible. Mr Co-chairman, do you agree that these recommendations can be written up to that effect?”

*Remark by the French Co-chairman:* “It seems that to flesh out your proposal and link with the idea put forward by Mr Ono, we need to round out the town master plan with a master plan for the allocation of water resources, keeping in mind groundwater and surface water resources and by directing the research effort into alternative resources. I think that we could round out what was just said by putting things that way.”

*Reply from the Permanent Secretary:* “Thank you, Mr Co-chairman, I will see to it that it is written up that way, in other words make sure that there is a dovetailing of the town master plan, the needs of the community and tourism, and a master plan for the supply and delivery of water. In other words, look for potential water sources, wherever they may be. And, I apologize. There is a crucial point that has been talked about for a long time and that Mr Uk Someth strongly repeated: do something about deforestation on Phnom Kulen because that is causing water to be lost, causing erosion, etc. So we will make a comprehensive recommendation for the Government.”

The Co-chairmen approved the recommendation put forward by the Permanent Secretary, who had some further information to add.

*Mr Azedine Beschaouch:* “I think that on this point, we have covered all the issues raised today with regard to development. I have a couple of points to add, if you allow, in conclusion. One is a point of information, the other a request, which I shall present first.

Your Secretariat has been asked via the recommendations to see to it that *ad hoc* experts are available for what has been our focus for years, i.e. conservation, but also *ad hoc* experts to provide advice in the area of development. I was led to believe that France already had something in mind. Is this on the agenda, or should we wait and see if the same is true of Japan and the APSARA National Authority? This way, the three authorities we answer to, if I might put it that way, can assist the Secretariat in making these experts available. Can we raise the matter now or should we wait? We have no particular preference. Whatever you say we will do. But a decision was made asking us to do that.”

*Reply from the French Co-chairman:* “Speaking on behalf of both Co-chairmen, can we wait for the next Plenary Session and the two Co-chairmen will make some proposals on this matter?”

The Ambassadors of France and Japan indicated that they preferred to wait.

*Remark by the Permanent Secretary:* “So will it be for the next meeting. Just so that when we make our report at the next meeting of this Committee, we already have a clear decision or indications on what is to be done.

The point of information is that the Department of Monuments and Archeology, in its two components 1 and 2, has decided to put out an information letter and we are happy to announce that we have the first issue. It contains articles written by members of the department, both
DMA-1 and DMA-2, as well as contributions with names such as Professor Nakagawa, Professor Gaucher, Christophe Pottier and so on.

It is noteworthy that it appears in three languages, Khmer, English and French. I don't want to complicate things, but since I see some Japanese names, I am suggesting that my friend Mr Ros Borath include an article or two in Japanese. I think our Japanese friends in Phnom Penh and here especially on the JASA could help you. It would be good if the second issue could have four languages, that is, your national language, French and Japanese. These are the two countries we have to answer to, and of course English which is the common language for all the other teams. That's what I suggest, but let's have a hand for this first issue."

*Remark by Mr Tan Boun Suy:* "I would like to suggest something for the water problem. We could encourage water harvesting during the rainy season, putting in eave troughs and large jars to collect water during the rainy season and store it, as is done in the other provinces of Cambodia. Siem Reap is the only province where people don't do this. Instead of relying on wells and draining the ground water, we could store rainwater from the rainy season."

*Remark by the Permanent Secretary:* "Thank you. I think that the Co-chairman will allow me to make a recommendation. You are an APSARA National Authority director. You are a specialist in this matter. You hold a doctorate degree and are a university professor. So I ask you, beg you, to be so kind as to write up a memorandum on what you just said. Your Secretariat will forward it to the Chairman of the APSARA National Authority. It’s wonderful to hear from a Cambodian specialist. We have been talking about alternatives, and here we have one! So please, we are looking forward to your memorandum and it will go right to the top, we assure you."

*Remark by the French Co-chairman:* "I would like to add a proposal that our Standing Secretariat has already made about the organization of our Technical Committee meeting. I counted them and we heard 50 different presentations, all of them packed with information. We also know how frustrating it is for some experts to be pressed by the time limit and who don't have the opportunity to interchange with other experts. I am wondering if we couldn’t do something about this at our upcoming Technical Committee meeting by organizing two workshops, one on safeguarding and conservation and the other on sustainable development, like we did in Paris in November 2003 at the intergovernmental conference. In this way, we could have much more time available for information exchange among the experts. But the conclusions of the two workshops would be presented at the closing plenary session."

*Reply from the Permanent Secretary:* "It's very late so we can’t discuss this at length. But let me make two remarks, because this was brought up several times before. It is very good as we all realize for the tourism specialist to hear presentations about the temples and vice versa. That's what’s so special about this Committee, the only one in the world where this is done. I think it would be very bad if we were separated. What’s so special about this Committee is that we talk about everything, including nuclear physics. On this subject, I had to go ask a great specialist to explain to me a measurement that I didn’t understand. That’s what makes this Committee so appealing, so interesting. So, Mr Co-chairman, can I say just one thing. Instead of a day and a half, we could have an extra morning. Everybody comes up here for a whole week, not just two days. So we could have two days instead of a day and a half. Today we got 40 minutes behind and yesterday 35, not even two hours. We pushed some speakers and I publicly apologize, but if we had another morning, the problem would be solved. Everyone would be able to talk and we would never go over 50. But we will look into this matter with our two Co-chairmen for the next time, because it’s up to them to decide.”
IV. MISCELLANEOUS ITEMS AND RECOMMENDATIONS

IV.1. Miscellaneous Items

IV.1.1. Proposal for Insurance for Visitors to the Angkor Site, by Mr Roger Ogden, Vice-President of International Commercial Insurance Company Plc.

[OrigE] "On behalf of ICIC Insurance, I’d like to thank you for attending our short presentation on the subject of an integrated insurance, a medical assistance program for all visitors to Angkor Wat.

The problem: The Angkor temples are the main tourist attraction in Cambodia providing the country with significant and important tourist revenue. The area is very well managed, but is currently lacking medical facilities of an international standard on site. Also if evacuation is needed these costs can be very high and tourists could be stranded without the necessary funds or insurance covers. All visitors to the site are at risk from injuries or illness including non-fee-paying Cambodian visitors.

Our proposed solution is a fully integrated program comprising on-site medical facilities; fully equipped ambulances and a clinic on site; a 24-hour operations center providing full medical intervention cover and an internationally backed insurance plan to cater for all the above.

Following a detailed site survey by our team of medical and evacuation specialists we have determined that the following facilities are necessary at the site to implement the scheme: 5 emergency ambulances fully equipped (air-conditioned etc.) to provide first aid and assessment facilities. One would be at Angkor Wat, one at Angkor Thom, one at Ta Prohm, one at Banteay Srei, one ambulance based on site at the clinic for transportation of the patients for referral purposes to the hospital or clinics.

In addition to these ground ambulances we also would like to use the facility of the helicopter which is based at the airport here in Siem Reap. It’s not always available but particularly for the far out sites like Banteay Srei, it’s more effective and better for severely traumatized patients to be flown by helicopters. So we’ve made arrangements in that event.

Each ambulance will be staffed with 3 persons: one male driver; one regular male nurse; one ICU trained paramedic/doctor. The reason for the male nurse is not chauvinism, it’s the fact that the ambulances of course, as you’ve seen from the DVD, can’t always get near to the temple and it’s a fair weight to carry a patient on a stretcher.

In Siem Reap itself, for all simple pathologies our clinic, the Angkor International Clinic, should be used. For trauma patients with strains or fractures again the clinic could be used. But for more severe pathologies we’d prefer to use the Children’s Hospital which has full facilities for treating such problems as internal bleeding. In any case only very light medical problems can be taken care for the moment in Siem Reap and that’s where the evacuation problem comes in.

We set up a 24-hour operations center providing a full medical intervention service. The operations centre is based here in Cambodia with the support of a network worldwide covering..."
every country and that can arrange for air ambulances, ground transport, and hospital facilities for any patient that cannot be treated in Siem Reap. There’s a qualified doctor on call to make decisions on evacuation cases and facilities to arrange for evacuations from Siem Reap to Bangkok or Singapore for example. There’s a full office in Cambodia and a support network worldwide. Our service providers, Asia Assistance Partners, have full offices in Cambodia, Thailand, Vietnam, Australia, Hong Kong, Singapore and Paris with a network of other offices through Europe America Africa and the Middle East.

Part 3, this is the important bit, the insurance plan to cover all the costs relating to part 1 and part 2. This is a seven section policy, specially designed. Section 1 covers emergency medical expenses with a sum insured of up to US$ 20,000. Section 2 covers emergency evacuation, the sum insured is US$ 500,000, this can be very expensive. Section 3: Medically required repatriation, again the sum insured is US$ 500,000 if the severely injured need to be returned to their country of origin. Section 4: return of mortal remains, the sum insured is US$ 15,000, if the insured unfortunately dies whilst visiting the site or as a result of an accident on site. Section 5: other expenses that could be incurred such as the dispatches of physician and or medicines to site, return of dependants—the cost of a ticket—the compassionate visit, if needed, by a close relative or spouse and convalescence expenses after the trip to the hospital for up to US$ 1,000. Section 6: Personal accident cover, US$ 10,000. This covers death and permanent disablement. If any visitor dies or suffers a badly disabling condition, there’s an automatic payment of US$ 10,000. Section 7 is a special add on: it covers third party legal liability of US$ 10,000 for visitors riding the electric motorized bicycles in the complex and we provide an extension on the policy to cover this in case they have an accident or they drive into someone or something.

The benefits to the Cambodian Government and to the APSARA National Authority:

1) It will provide a positive image of tourist facilities in Cambodia.
2) It enables the visitors to have access to an internationally acceptable standard of medical facilities and care.
3) It relieves the Cambodia Government and the APSARA Authority of the burden of sick or stranded tourists.
4) As part of the communication service provided at Angkor Wat, the 5 ambulances for use by ticket purchasers will also be available free of charge for use by Cambodian non-fee-paying visitors. This is for first aid purposes and transport to Siem Reap Hospital only.
5) The scheme will be very simple to administrate.
6) It will cover anywhere within the geographical designated area including trips to and from the site.
7) It will cover any tourist up to age 75 including non-fee-paying children under 16 years of age which are included on their parents’ tickets.
8) It will cover normal site hours currently 6 a.m. to 6 p.m. or as soon as the entry point is opened including also any functions or events as authorized by the Authority outside of these normal hours.

Finally, the security of our insurance cover. One of the concerns regarding the insurance cover is who’s behind it. All our cover is reinsured outside of Cambodia. For reinsurance we use a Lloyd’s facility and other approved first class security. All our claims are settled directly with the medical facilities, airlines and air ambulance providers and ICIC. At no time, and this is important, does the patient have to pay any money. The medical assistance, evacuation/ repatriation part of the program, is underwritten by Houston Casualty Company from America, and medical and personal accident cover is reinsured by our treaty reinsurance leader, Best Reinsurance from Tunisia, also a highly rated reinsurance company.
That very quickly outlines our program. Our team would like to thank you for taking the
time to listen to us this morning and should you have any questions of points you would like to
raise we’d be happy to oblige, if not now then in the coffee break afterwards.”

**Remark by Mr Azedine Beschaouch:** “Without going into a discussion of the matter, since this is a
point of information, I would like to say that HE Mr Bun Narith forwarded to us a copy of the
document in good time, which we looked at, and the positive aspects that you just heard are
quite obvious. In other words, the visitor experience will be improved. Furthermore, some very
impressive emergency medical treatment will be available, and that is something we really do not
have on the Angkor site, there’s no doubt about it. We are asking, and I am doing so on behalf of
the experts and the Secretariat, that one point be considered; that is, what will happen if
someone already has insurance? That would apply to all Europeans, Japanese, Indians,
Australians, Americans, etc. who may be insured in both ways.

I don’t want to get into a heated debate on this, but the most important point is that if
someone has taken out life insurance, it covers all risks. International credit card holders—
American Express, Visa Premier, etc.—sign a travel insurance policy or see that their travel is
covered. We would like you to look into just this one aspect, what would happen if you make this
mandatory? It would mean having double insurance, and that’s not possible. So to sum up, the
positive aspects are most important; they’re obvious. It will mean improvements on all fronts,
but please study out this specific point, what would be done when people come but who already
have a life insurance policy or are covered through their credit card? If you can solve that
problem, I think that everyone will be happy to see a system put in place that will improve the
‘visit Angkor’ image, as you pointed out.”

**IV.2. General Recommendations of the ICC, by Mr Azedine Beschaouch, ICC
Permanent Secretary**

The Permanent Secretary of the ICC read out the recommendations to the audience and
two Co-chairmen, who gave them their approval.

**V. CLOSING SESSION**

**V.1. Statement by the Co-chairman for Japan, Mr Susumu Inoue**

“Our Excellency Mr Sok An, Deputy Prime Minister and Minister in Charge of the Council of
Ministers,
Excellencies,
Ladies and Gentlemen:

To conclude these three days of meetings that have proven rich in quantity and quality,
with contributions from many national and international reporters, I would first of all like to thank
all of you for attending this outstanding 15th meeting of the ICC Technical Committee these last
three days in this beautiful conference hall. I would like to thank the ICC Secretariat in particular
for the impeccable quality it put into preparing this committee meeting. I would also like to thank
all contributors for their fast-moving, effective and constructive presentations. I would like to pay tribute to the APSARA National Authority for its ongoing efforts to achieve a greater level of autonomy in safeguarding the Angkor World Heritage Site as well as to protect the natural environment surrounding it.

This Committee is giving its constant support to the APSARA National Authority’s diligent efforts to diversify activities, which includes the exemplary exchange program set up with the Versailles Public Institution, capacity building in the areas of planning and space management, itineraries and tourism in general, as well as for community development, in a word, its efforts to walk the way of organizational self-sufficiency. I am delighted with the initiative taken by the APSARA National Authority to come to grips with the longstanding and thorny problems of the environment, but especially water. I warmly welcome the recommendation made by this Committee to invite a Mekong River Commission representative to the next meeting of the ICC.

I would also like to pay tribute to the Chaillot Center for Advanced Studies for the creation of the Cambodia Center for Heritage Training. Human resources development is of crucial importance here. I am likewise very happy to see the assistance given to Cambodia through the UNESCO project at the RUFA which is targeting skills development for young Cambodian students.

[OrigK] Your Excellency Mr Sok An, Deputy Prime Minister and Minister in Charge of the Council of Ministers, Excellencies, Ladies and Gentlemen,

I am very happy to have served as Co-chairman of this meeting of the ICC Technical Committee. Today’s meeting is very important, for it is the first time in over ten years that we could use the Khmer language at the ICC meeting. I feel that the language of a country reflects its culture. It is most noteworthy that Cambodian participants at this meeting could use Khmer, the history of which is older than that of the Angkor temples, to discuss protecting the Angkor temples, symbol of Khmer culture.

I would like to take this opportunity to thank the Government of Cambodia, in particular the APSARA National Authority and the province of Siem Reap for assisting and cooperating with the both the Japanese and French Co-chairmen as well as with the UNESCO Office in Phnom Penh.

I hope that in the near future, the APSARA National Authority will be duly empowered to resolve the crucial problems faced in linking development and preservation of the temples and the matter of the environment.

[OrigF] Excellencies, Ladies and Gentlemen,

I recently learned with much sadness and regret that my dear colleague Mr Dominique Dordain, Advisor to the Embassy of France and who as worked with me as Co-chairman of the ICC Technical Committee, will soon be completing his four-year mission. We are sorry to see him leave because the extension of the ICC’s jurisdiction these last few years has been largely due to his outstanding contribution. I would like to take the opportunity today to pay tribute to his wisdom, passion for Khmer culture and spirit of cooperation that greatly facilitated the smooth operation of this Committee.
His outstanding devotion to protecting the Angkor heritage reminds me of another French diplomat in the 19th century whose name was Mr Aymonier, if I remember correctly. He was a senior diplomat assigned to Phnom Penh, a man who pioneered research in Khmer culture, who was also a linguistic genius with a mastery of Latin, ancient Greek and Sanskrit and who became impassioned with the Khmer culture and language as soon as he set foot in Cambodia and who went on to devote his life to research on Khmer culture. He was the first person to write and publish a French-Khmer dictionary, one that he wrote out by hand. I have been very much taken with the extreme beauty of his writing in Khmer.

I would like to thank Mr Dordain again for all that he has done to help us. I hope that he will be with us even after completing his senior mission with the Embassy of France in Phnom Penh.

I also would like to thank the three-way team of interpreters who worked in French, English and Cambodian over the three days for the smooth functioning of our session.

In conclusion, I would like to thank all the foreign delegations who put themselves out to be here in Siem Reap and attend this meeting of the ICC Technical Committee. I am hopeful, actually convinced, that this Committee will continue to be a model of international cooperation for the safeguarding of world heritage, the grandeur and value of which go beyond the national framework as is the case with Angkor. Thank you for your attention.”

V.2. Statement by the Co-chairman for France, Mr Dominique Dordain

"Excellency Mr Deputy Prime Minister,
Your Excellency the Governor,
Honorable Secretary of State,
Honorable Director General,
Honorable Ambassadors, Official Representatives,
Honorable UNESCO Representative,
Distinguished Guests,

This 15th Technical Committee meeting of the ICC was marked by the richness and depth of the presentations involving all aspects of heritage and how it fits in with economics and social affairs.

As for safeguarding and conservation, I welcome the 11th draft of recommendations for conservation and restoration of the Angkor monuments that Professor Croci epitomized remarkably on behalf of the group of experts. This document is getting more refined and precise from year to year. For each monument, the principles have been tested against the reality of the field. The field experience inputs the doctrine and gives it more substance.

At the same time, the source of historical information is being expanded with a more precise chronology for the formation and transformation of royal structures over the centuries:
- From the oldest at Roluos
- Followed by the new capital, Yashodapura, around Phnom Bakheng
- And concluding with Angkor Thom, the largest city ever seen in Asia at the time.

Three capitals to be explored—no tourist would think about visiting three capitals in just one day. Can we not suggest touring at a more appropriate speed, one historic capital per day? That’s something for tour organizers to think about.
We also were happy and relieved to learn at this meeting that conservation interventions are already underway on the Koh Ker group, while the *ad hoc* experts will be sizing up what is being done.

We also noted that while the APSARA National Authority is expanding its spatial jurisdiction it is not overlooking the quality aspects and is complying with the ISO 14001 quality standards. This is to be commended and encouraged.

All of these aspects have been covered in the recommendations that were just presented to us by our Permanent Secretary.

With regard to site management, Mr Boccardi pointed out in his introductory speech that Angkor is confronted with a process of ongoing, accelerated mutation, which means that the APSARA National Authority will need to give itself:

- The means for future planning and model building that take all the factors of change into consideration
- As well as management tools (a land registry and land use plan, a building code and habitat improvement standards based on architectural tradition)
- And legal instruments for negotiation that clarify the procedures for linking with the private sector in such areas as selection of services to which concession privileges are granted

The private sector should not be feared, but rather partnership instruments need to be developed so that private companies can respond to calls for bids based on specifications.

We also noted that the Tourism Development Department has suggested diversifying the tourism offer with new itineraries that allow for greater involvement of the local communities.

A number of programs for visiting and interpretation were presented, which means there will have to be stop-off centers in the field, on the sites, emanating from a midpoint visitor intake and information center which will soon be constructed. The long-term site management plan will flesh out these proposals.

Making the past more relevant in space and in the downtown area will also help the local people feel closer to their identity, to their roots, and thus assume ownership of their heritage. This applies to those living on the site as well as for all people in the Kingdom.

The proceedings of our Technical Committee are designed to prepare the directions taken at the Plenary Session, and many of the proposals formulated at this meeting may be again on the agenda at our meeting at the end of the year.

The quality and continuity of these meetings would not be a sure thing were it not for the participation of the teams working in the background to organize them. I would particularly like to express my thanks and gratitude to all of the APSARA teams and to HE Mr Bun Narith who is coaching them. I counted 72 persons, including the most recent, Mr Chin Dimang, with the Department of Population and Development, on all of the teams that include young management staff. I also thank the UNESCO delegation led by Mr Teruo Jinnai and Mr Azedine Beschouch, our Permanent Secretary, as well as the Standing Secretariat team from Phnom Penh, Mr Blaise Kilian, Mrs Chau Sun Kérya and Mr Sam Rithy who are now assisted by Ms Nao Hayashi, who came in specially from Paris.

Of course, we also thank the UNESCO experts, Mr Giovanni Boccardi from the World Heritage Committee along with Mr Claude Jacques, the *ad hoc* experts, Mr Giorgio Croci, Mr Pierre-André Lablaude and Mr Hiroyuki Suzuki, whose skills shed light on our path.
I would like to inform this Committee of some good news that involves our Scientific Secretary, Mr Azedine Beschouch. The French National Academy of Architecture has just decided to award him the Restoration and Conservation Medal in recognition of his work in his homeland, Tunisia, that I am very familiar with too, and throughout the world under the aegis of UNESCO, for some forty years. On behalf of this Committee I would like to convey to him our warm congratulations.

I would like to conclude by telling my Co-chairman how touched and moved I was by his words. I have shared in the proceedings of this Committee with the greatest pleasure since its 9th session in 2002. I have learned a lot from you. I have changed a lot, because I had been influenced by my studies, by Samuelson and Keynes; here, I learned that culture could be a factor for development and progress. Thank you all.”

V.3. Statement by the Representative of the Royal Government of Cambodia, HE Mr Sok An, Deputy Prime Minister and Minister in Charge of the Office of the Council of Ministers, Chairman of the APSARA National Authority

"Honorable Co-chairmen,
Excellencies,
Distinguished Professors,
Ladies and Gentlemen:

I was preparing as usual to attend the full proceedings of the 15th Technical Session of the International Coordinating Committee for Angkor. However, other pressing commitments relating to my government responsibilities prevented this. However, I have been fully briefed on your discussions and on a number of important matters that the Committee debated in depth and that will have an impact on the future.

I would first of all like to extend my sincere regards and the warm thanks of the APSARA National Authority to the two Co-chairmen and to you ladies and gentlemen, members of the ICC.

Indeed, you have given much attention on the one hand to the technical and sometimes ethical problems that come up with regard to safeguarding the Angkor heritage, which is a duty incumbent upon us and, on the other hand, to urgent matters of a socio-economic nature brought on by development, which is a compelling need. This is in line with the policy of the Royal Government under the leadership of His Excellency Prime Minister Samdech Hun Sen. Its basic tenets remain tangible, to wit:

- Firstly, deploy all means in the ongoing fight to alleviate poverty
- Then make Angkor, this jewel of mankind’s heritage, an economic and social driver, leading the rest of the country on the road to growth, progress and prosperity
- Give Cambodians an increased sense of dignity and pride, so that they relate more strongly and legitimately to their roots in the great Angkor civilization

You can therefore understand why I want to be at all sessions of your Committee. Your approaches and suggestions are always taken into consideration by the APSARA National Authority and we are always happy to receive your sound advice.

Excellencies, Ladies and Gentlemen,

Once again you have had an agenda that gave priority to the essential requirement for sustainable development: water. I would like to congratulate the JICA officials and technicians for completing the Siem Reap Water Supply Master Plan. This timely achievement will enable water supply and delivery issues to be dealt with comprehensively and rationally. But beyond Siem Reap town, home to a burgeoning population and many tourist amenities, the APSARA
National Authority is taking a close look at the Angkor hydraulic system and its current operation. Research is being conducted to find water sources in relation to the barays and subsidiary reservoirs. We are hopeful that these research efforts will be successful and allow us to increase the volume of our reserves.

On the matter of water, we are all aware that it is a critical problem, crucial to sustainable development in Siem Reap. It is connected to the very foundations of the temples, which is a matter of paramount concern. I would like to take this opportunity to say that we would welcome any form of investment—private, semi-private or public—that might help resolve the water problem in Siem Reap. JICA has done studies, has brought the Master Plan Study of Siem Reap to a successful conclusion, and I think that companies or businesses can base themselves on the results of this research, of this study, and carry on further studies in an effort to set up concrete projects for clean water distribution in Siem Reap, for we have already looked into the pros and cons, the positive and negative consequences of water usage in the Siem Reap / Angkor region.

Therefore we would welcome, I repeat, any and all forms of investment in Siem Reap / Angkor based on the rational scientific studies that JICA has carried out, to pursue research and find an appropriate solution to this problem of water that is crucial for the sustainable development of Siem Reap.

Similarly, as you realize, proper management of water in the Siem Reap / Angkor zone goes hand in hand with proper management of the environment. In this regard, I am happy to highlight the value of the ‘green belt’, an expression that I use again and again. We are planning for one to be put in as soon as possible. Development of suburban agriculture zones and protecting the tree cover of the Angkor forest as well as on the Kulen Plateau will certainly help enhance the living conditions of the communities as well as the landscapes to be worked into tour itineraries.

The recommendations also make mention of deforestation taking place on the Kulen Plateau. I would like to take this opportunity to inform you that recently we looked very closely at this problem of deforestation and land grabbing. A few weeks ago we made a thorough study of cases in certain provinces. A very firm decision was made in some cases in Kampot province. More information will be forthcoming. I would like to inform you that very firm measures were taken. We are also in the process of studying the case of Stung Treng province, and I think that in a few days we will get to the case of cutting down trees, illegal deforestation on Mount Kulen, and we will decide what measures have to be taken.

Most importantly, intensifying agricultural activities and preserving trees will be effective in preventing the disastrous consequences of ecosystem upheaval, rainwater runoff and soil erosion. Fortunately our efforts are receiving excellent support from international cooperation. New Zealand has signed a special program with us under its funding. Implementation has been started with the APSARA National Authority. Germany is lending us its assistance for the ‘green belt’ project. And very recently the University of Chicago decided to join in with these efforts by launching a research program in rural communities in Angkor Zones 1 and 2. It has a socio-economic component that will contribute to community development.

I am therefore very pleased to express our deep gratitude to the representatives of New Zealand, Germany and the Universities of Chicago and Florida. The APSARA National Authority will hold up its end of the partnership and do what is needed for the success of these programs.

Honorable Co-chairmen, Ladies and Gentlemen,

Obviously, proper management of water and the environment is also of concern for the World Heritage Site. It has communities living on it and the policy of the Royal Government is not limited to preserving the integrity of the historical monuments and the authenticity of cultural property. We must also do everything we can to improve the daily standard of living for these communities. We are looking after this.
As for the monuments, the specialists and scholars among you are well aware of the harmful effect of stagnating water and infiltration. You also know how much the long-term cost will be if nothing is done to see to the sustainable management of the trees in and around the architectural structures. So the APSARA National Authority is making a new appeal to avoid any neglect in this area. The national and international teams working at Angkor must always appreciate that safeguarding artistic, archaeological and historical heritage is not limited to conserving or restoring stone. Trees are also a heritage and deserve to be treated as such. The well-known example of the tree-temple Ta Prohm, a real jewel, is eloquent testimony to this.

For this reason our cooperation programs for training specialists and technicians will include a component on arboriculture in historical environments and tree cover management in monument zones. I am therefore very happy with the prospects for the APSARA National Authority as it enters into an exchange program recently signed with the Versailles Public Institution. This is a timely strengthening of scientific and cultural cooperation between France and the Kingdom of Cambodia. We also see therein the beginnings of a successful partnership that we hope will last for a long time and lead to new horizons. Once again, I would like to extend a warm welcome to Ms Christine Albanel, Chairperson of this institution, and wish her a pleasant stay in this country. I am sure she will be back to visit Angkor and that she will give special attention to implementing this program.

I would also like to say how happy I am to see India giving priority to work on the Ta Prohm temple in harmony with our wishes. The Co-director General of the Archaeological Survey of India, Mr Sharma, came especially to Angkor to look into the structural stability of the monument, drainage problems and what to do about water stagnating inside the temple. But his main focus is sustainable management of the Ta Prohm trees. I feel that the methodology being used is exemplary. We are happy to see that there has been a meeting of minds and a consensus between the Indian team and the UNESCO ad hoc experts. I am pleased to extend my congratulations and sincere thanks to Mr Sharma and his team.

Excellencies, Ladies and Gentlemen,

Your session truly had a full and diversified agenda. I don’t see any reason to apologize for or criticize this amplification. It is a reflection of the issues that you are dealing with in the field and your partnership with the project owner, the APSARA National Authority. There would be no objection to extending these proceedings over two full days, even three, if necessary. The important thing is to stay on track, that is maintain the atmosphere of friendship and consultation that makes this Committee something unique. I was briefed on the matters discussed under the headings of conservation and research and I would like to express my satisfaction with the results.

I also wish to express my satisfaction at seeing the special interest you gave to tourism management at Angkor in particular and to tourism development in Cambodia in general. Having a contribution from HE Mr Thong Khon is a token of the special attention that HE Prime Minister Samdech Hun Sen is giving to the issue of tourism in this country. In this regard, let me point out again that the Royal Government feels it is important to increase revenue generated by the tourism sector, to try to get more tourists to come from one year to the next, as well as to put emphasis on quality tourism, seeing to it that Angkor and Cambodia attract an upscale clientele and encourage them to stay longer.

Of course, opening regular air flights between Siem Reap and Sihanoukville will soon enable us to advertise the exceptional cultural heritage and natural landscapes of the flooded forest and banks of the Tonle Sap as well as the delights of our unspoiled and beautiful beaches. Along with that goes, as you just recommended, diversifying the tourism offer through quality animation, making fine quality arts and crafts available and keeping a close eye on food hygiene.
I would also like to inform you that last week I had a very important internal meeting on ways of showcasing the Kratie region where we have the freshwater dolphins. We had a presentation from the National Commission for the Preservation and Promotion of Dolphins. The Commission showed us the life of the dolphins, a mosaic of landscapes in Kratie province and highlighted the importance of airports in Kratie, Ratanakiri, in the northwestern provinces, and in Stung Treng. The meeting was unanimous in deciding that the Kratie dolphins and natural landscapes in the province would fit into the ecotourism offer in Cambodia and thus be a tourist attraction. We feel that it is very important to restore the airport in Kratie.

The Siem Reap / Angkor region would normally be the main gateway for cultural tourism in Cambodia. But it is also very important to link this gateway to other secondary gateways. There is the Sihanoukville hub that is drawing a growing number of visitors coming in on cruise boats. This year we have already had 40,000 such visitors. And most would like to visit Angkor. So we announced, on the basis of our agreement with the French VINCI Group that a Siem Reap-Sihanoukville flight will be started later on this year, perhaps with ATR aircraft. We are thinking about putting an air bridge between Siem Reap and Kratie so tourists can be invited to go and see the Kratie dolphins. The National Commission experts are sure that this is feasible. Some have expressed fear that tourists will go to Kratie but won’t get to see the dolphins. But the Commission assures us that it can organize tours to the dolphins. Some experts claim that there are about 80 of them, while others say that the number is over 100. So an air link between Siem Reap and Kratie would also be very important to enable tourists who go to see Angkor to also take a look at the Mekong River dolphins.

In conclusion, I invite His Excellency the Governor, his assistants and their associates to complete the Siem Reap River beautification program. Mr Bechouch, the ICC’s Scientific Secretary, complimented our new governor and I would like to take this opportunity to compliment him as well. You can see he is a mover and a shaker, and I hope that he will contribute even more actively to the development of Siem Reap and that he will promote even closer cooperation with the APSARA National Authority. I am soon going to move that he be appointed Vice-chairman of the APSARA National Authority board of directors.

Let me conclude my statement by expressing my thanks to our Co-chairmen and to you all of you, Excellencies, ladies and gentlemen, here present. Thank you for your attention.”

V.4. Statement by the Representative of the UNESCO Director General, Mr Teruo Jinnai

“Excellency, Deputy Prime Minister,
Honorable Co-chairmen,
Excellencies,
Ladies and Gentlemen:

I would first like to thank His Excellency the Deputy Prime Minister and Chairman of the APSARA National Authority for honoring us with his presence here. This shows again the importance he gives to the proceedings of the ICC as well as his personal commitment to the preserve and development of Angkor.

We are now at the end of this 15th Technical Meeting of the ICC. On behalf of the Director General of UNESCO, Mr Koichiro Matsuura, I would like to express my warmest congratulations to all of the contributors for the quality of their presentations and express my most heartfelt wish that this successful partnership between the international and national stakeholders will continue into the future.

The recommendations formulated at this meeting and adopted by all are of crucial importance. These recommendations were read out and explained in extenso by our indefatigable Permanent Secretary, and I have a brief comment to make about them. Indeed, they focus as
usual on technical problems incidental to conservation and research, as well as on issues of sustainable development. But they again highlight the elementary necessity of developing a long-term vision within the APSARA National Authority in order to ensure a management approach that is comprehensive, coherent and operational for the Angkor site. This is in keeping with the guidelines developed by the World Heritage Convention for sites that are listed. On behalf of UNESCO, I can assure you that the Standing Secretariat—and this is also a recommendation—will devote all its energy to following up on these recommendations and report back to the Committee.

I would like to thank our Co-chairmen for the efficient way in which they presided over the debates and their friendly exercise of authority, as well as Their Excellencies the Ambassadors of France and Japan for being here, which reflects the constant support that these two countries are giving to the proceedings of the ICC. I also thank the ambassadors of other friendly countries, such as Germany and Canada, who kindly arranged to attend this great meeting.

I would also like to make mention of our teams on the Standing Secretariat who were already mentioned by name by our Co-chairman, Mr Dominique Dordain, and the team of translators who did an outstanding job, as well as our friends from the APSARA National Authority.

Excellency, Deputy Prime Minister, Honorable Co-chairmen,

The confidence that you continue to show in UNESCO—that you have kindly asked to provide the services of Standing Secretariat of the ICC—is an honor and stimulus for us. On behalf of the UNESCO Director General, please be assured that we will continue to do everything we can to be up to your expectations.

In conclusion, the Co-chairmen suggested to our Secretariat that the next Plenary Session be held from December 6 to 10. You will be informed as soon as the dates are finalized. Thank you very much for your attention.”

**Conclusion of the proceedings of the 15th Technical Committee meeting.**
### LIST OF PARTICIPANTS

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<td>BESCHAOUCH Azedine</td>
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