

# **Ancient Khmer and Southeast Asian Ceramics: New Archaeological Findings, Production and the Revival of Techniques**

**CKS Conference Hall, Wat Damnak, Siem Reap-Angkor, Cambodia**

**Friday December 14, 2007**

## **Abstracts (alphabetical order)**

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### **“Prasat Ban Phluang ceramics re-visited”**

Although many thousands of Khmer ceramics from northeast Thailand have filtered onto the Bangkok market since at least the 1930s, there have been very few excavations. Besides work on individual old kilns in Buriram, none of which revealed evidence for age, there has been only one single excavation that gives clues about dating the ceramics. It was a limited excavation of the earth around the single tower Prasat Ban Phluang temple that was conducted in 1975. Since the dating of Khmer ceramics from the Buriram kilns still rests entirely on this single small excavation, it is worth reviewing the evidence and finds. Except for a concentration of unglazed earthenware at the lowest levels, the finds consisted of shards from vessels that seemed to have once been set near the doorway to the temple. Over time they became broken and the pieces were swept haphazardly off the temple platform onto the earth. Analysis at the time suggested the temple had been built about AD 1050 and fallen into disuse after the early 12th century. Three decades later, it is worthwhile to re-examine and perhaps refine the Ban Phluang findings in light of more recent archaeology.

**Ms. Jane Calthorpe**      [janeccal@bigpond.net.au](mailto:janeccal@bigpond.net.au)  
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### **“Pre-Angkorian earthenware ceramics at Wat Bo, Siem Reap”**

In October and November last year (2006) I worked for two months with Cambodian archaeology student Kesornicole PEN at Wat Reachbo, more commonly called Wat Bo, documenting the pre-Angkorian earthenware ceramic collection and converting her completed Khmer catalogue into English. The final aim of my project was to produce a digital catalogue that would be a useful research tool for both local and overseas students and a permanent record for Wat Bo. I was given permission to do this by the person responsible for the ceramic collection at Wat Bo, the Venerable Monk Lok Ta PIN-SEM

Nearly all the 500 ceramics are intact and were found buried with skeletons and other artifacts in the Phum Snay area of Banteay Meanchey Province in Cambodia. They provide an important record of ceramic materials, size and forms from an era that predates Angkor. Tragically, there is no archaeological record for these beautiful

vessels. My colleague Kesornicole PEN will discuss the story of the collection at Wat Bo and how it came to be there.

The digital catalogue is now complete and will be available as a DVD, free of charge, to conference delegates. I would like to thank EA Darith from APSARA Authority and Christophe Pottier from EFEO for their help and advice. It would not have been possible to complete the project without the assistance and support of CHEA Sarith from APSARA and Kesornicole PEN.

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**“Food for Thought: Cylindrical jars in the Bayon bas-reliefs”**

Among the most charming of the bas-reliefs of the Bayon at Angkor Thom is the scene that has been described as a field kitchen. It depicts the preparation of a meal; large cauldrons sit atop roaring fires, a cook pours rice into a pot while two men roast meat over a fire. One feature of this vignette that has received little comment in previous studies of the bas-reliefs is the two types of cylindrical vessels depicted. The smaller type is shown in groups on trays; the larger type appears to be a kind of canister. I will argue that these vessels may be ceramics of Khmer origin, although other possibilities for their source will be explored. In addition, I will present material culture evidence of similar vessels depicted thousands of miles away to demonstrate that the style of the cylindrical vessels produced during the Angkorian Empire may have been diffused and/or transferred to other pottery centers where they became a commodity in subsequent global trade.

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Presented by Jane Calthorpe. See attached notes to accompany images.

**“Representations of ceramics on Khmer temples”**

Angkorian bas-reliefs occasionally show ceramics, both Khmer and non-Khmer, with certain types of pottery being, it seems, restricted to specific contexts. For instance, drink-containers where the liquid is drunk through a straw—globular pots with a straight neck and plain rim—seem to be associated exclusively with foreigners at the Bayon, Banteay Chhmar and Angkor Wat. This paper examines various types of pots and their contexts; it goes on to make a comparison with representations on temples in Indonesia and India.

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**“New data on the distribution of Khmer ceramics kilns”**

Khmer stoneware ceramics and kilns in Angkor period have been identified in many places in Angkor (the capital city) and along the royal road network that connected the

capital to the other big regional Khmer communities. Among the four main roads from the city, along two roads to the western area have been found numerous groups of kilns in Banteay Meanchhey and Udar Meanchhey provinces in Cambodia and Buriram province in Thailand. The kilns in those areas produced mainly brown-glazed wares and fewer green-glazed and unglazed wares, while so far the kilns in the Angkor area appear to have made only green-glazed and unglazed wares. The two other roads to the eastern area have not been studied yet, but we found some Angkorian brown-glazed wares being used today by local people in the area. We don't know if there were kilns making brown-glazed ware in that area or whether the brown-glazed wares were transported from other places along the royal road network.

A recent survey along the royal road from Angkor to Phimai by the Living Angkor Road Project, a Thai-Cambodian joint research project, found interesting infrastructure along the road such as monuments, hospitals, bridges, rest-houses, water structures, habitation sites, local and imported ceramics, and metal and ceramic kilns etc. The first phase of the project was completed in 2006 and the second phase will focus on the eastern area. We hope that more sites will be found in the area.

Among the ceramic kilns found in the Angkor area, only the Tani kilns have been excavated and documented very well. Other kilns at Sar Sei, Anlong Thom, and Khnar Por are under excavation. Moreover, the Nai Jian and Ban Sawai kilns in Buriram province were excavated by the Fine Arts Department of Thailand. Comparison of the excavations in Thailand and in the Angkor area reveals differences in both the ceramic products and the kiln structures in those two locales.

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### **“Some new data on the technique of Khmer stonewares”**

The Kûlen stoneware production is based on a white or grey clay covered with a greenish glaze. Several of chemical analyses on Kûlen glazed stoneware was practised by two laboratories:

- the laboratory of Lyon (CNRS, Maison de l'Orient) by X-ray fluorescence to characterize the component of the clay,
- the laboratory of geology of Louvain-la-Neuve (Belgium) with a micro-probe so as to :  
    Find the components of the glaze of Kûlen stoneware  
    Compare them with that of the Chinese glaze

Tests were made on eight samples. Four of them came from excavations carried out in 2004 under P. Baty and A. Bolle management on the occasion of Siem Reap Airport enlargement. Four of them came from Thnal Mrec workshops.

Results asserted that the glaze of Khmer stoneware was similar to Chinese glaze considering the high rates of aluminium and calcium. Nigel Wood practiced analyses on Chinese glaze and proved that it was mainly lime-glaze composed of ashes with a high rate of calcium.

The origin of calcium is not to be found in the clay used to produce such vases but rather in the limestone ashes. Thus, limestone ashes addition seems to be the more probable

hypothesis and the low rates of potassium and sodium could be explained by the fact that ashes were washed, a practice known in China for long. These results confirm B. Ph. Groslier's (1981) hypothesis that the glazed stoneware technique was brought by Chinese potters.

In China, by the tenth and eleventh century, crushed limestone tended to replace ashes in the elaboration of glazes. Such process seems to be used for later Khmer ceramics. In the case of the workshop of Srah Srang, glazed sherds show the use of crushed shells for obtaining calcium for the glaze.

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### **“Changes in Dankwean that brought about ceramic development”**

*Changes that have taken place in products during the transition to primarily an export market in Dankwean Village Thailand and what lessons might be learned by the potteries of Cambodia.*

Cambodian potters face unique challenges in the attempt to learn to make ceramic wares that can be marketed to tourists and to other nations. Many of the challenges are not unique however and a close look at success stories from neighboring countries may help to focus energies and forewarn of pitfalls.

My paper will look at Dankwean Village, in Nakorn Ratchasima Province, Thailand. Since the early 1970's Dankwean has managed to transform itself from a typical rural pottery village to a vibrant exporter of ceramics and other handicrafts. Dankwean has succeeded because its fluid organizational structure has allowed it to remain flexible enough to insert itself into every opportunity that presented itself, and because its potters, designers, exporters and factory owners continue to innovate and learn. Looking at Dankwean ware from the past 30 years will give a visual history of the reasons for Dankwean's success.

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### **“A Potter's Point of View – ‘Evidence of the Hand’”**

Ancient architecture has always been a central motivator for me. My interest in kilns and hand-made pottery goes back to my childhood. I am still fascinated by objects that show evidence of the hand.

Currently, I am researching early American folk pottery at the University of North Dakota. Handling these pots is a powerful and emotional experience. As artists/craftspeople we are creating art history.

Thanks to academic pursuits, potters have a huge body of information and images to draw from. Our knowledge of Asian ceramics is extensive, however there are many pieces to the large puzzle that are still missing. Khmer ceramics in particular is one of the areas that can provide some of the interesting pieces.

The inevitable effects of progress present perhaps the biggest challenge. Historical evidence actual kiln sites provide, is being destroyed by people. Prospects of the numerous dams along the Mekong River must be a concern. Time is perhaps more urgent than it has ever been before.

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**“Wood firing for vitrified ceramics”**

The process of high temperature wood firing requires clays that will be able to withstand such temperatures and kilns of a suitable design to reach temperatures sufficient to vitrify the wares. This talk will cover my experience of this type of ceramics.

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**“Pre-Angkorian earthenware ceramics at Wat Bo, Siem Reap: Background information relating to the collection”**

As Ms. Jane Calthorpe has already informed you about our purpose and work at Wat Bo, I would like to give some further information about the place and how the collections were formed. Wat Bo can be reached to the East of the Siem Reap River Avenue. Here Khmer cultural heritage is preserved, not only ceramics, but ancient wall paintings and some wooden Buddhas dated to the middle period, amongst others. Fortunately, I have met and warmly spoken to the venerable monk Lok Ta PIN SEM who is the collector of these collections. He first started to collect the treasure in 1986-87, when he had been hiding from the Khmer Rouge-controlled Region at the Cambodian-Thailand border, where Khmer treasure was being sold to Thailand. He wished to save these objects, so he bought the objects from the sellers and preserved them.

In 2001-2002, Phum Snay, located in Banteay Meanchey province was explored for the buried skeletons with artifacts that were illegally being destroyed by villagers. Venerable monk Lok Ta PIN SEM was interested and went there with his students. When he first arrived he collected some messy broken skeletons and earthenware on the ground. Some beautiful vessels and beads were bought from the villagers. Finally, he decided to ask his students to clean and display the objects as the monastery's property. Unfortunately archaeological data was lost for all these collections but we still worked on it in order to document some part of pre-Angkorian ceramics collections, as Ms. Jane Calthorpe has presented.

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### **“Pottery of Sre Ampil Archaeological Site”**

Due to a contribution to the understanding of Khmer pre-history and culture, Cambodian archaeologists have continued to seek additional funding to undertake further research at Sre Ampil. The project succeeded in obtaining a US\$23,000 grant from the Center for Khmer Studies (CKS) to conduct further archaeological studies at Sre Ampil. The Sre Ampil project includes the construction of a museum and the excavation survey.

With the above funding the Sre Ampil Archaeological and Conservation project have fulfilled:

1. Museum construction in 2006
2. A test excavation before the museum construction
3. Excavation, survey and training program were concluded in 2007

The paper will describe the result of the excavation and the pottery analysis from the excavation from Sre Ampil site.

The result of the Sre Ampil pottery analysis shows the relationship between the site with Angkor Borei and Cheung Ek in different periods. Although C14 dating of the Sre Ampil site has not being done yet, the similarity of its pottery with that from Angkor Borei shows evidence of interaction (e.g. trade exchange) between those two sites. Pottery of the Sre Ampil site has its similarity with the pottery from Angkor Borei in the 3rd phase (dating was done by Mirriam Stark) which is dated from 3rd century to 6<sup>th</sup> century AD. Moreover spouts have been collected through the layers of the excavation. Collected spout is the type of *Candi* found at Angkor Borei. The fineware of the Sre Ampil is also similar in characteristic with the fineware from Angkor Borei. This site may have developed in between 3<sup>rd</sup>-6<sup>th</sup> century AD.

The Sre Ampil site also has interaction with Cheung Ek site. Surface collection and the upper layers consist of pottery originating from Cheung Ek site. Spatial factors clearly defined their relationship. These two sites could be reached by water transportation as the site could be accessible by the Lower Mekong and Bassac Rivers.

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### **“Khmer ceramic technology from Thnal Mrech Kiln 02, Phnom Kulen”**

This presentation is based on a full study on the excavation at Thnal Mrech Kiln Site in January 2007 (the report will be published soon as ‘*Archaeological Report Regarding the Assessment at the Thnal Mrech Kiln Site, TMK 02, Anlong Thom, Phnom Kulen, Cambodia*’, John Miksic, Chhay Rachna, Heng Piphah, Chhay Visoth). In January 2007, the Department of Monuments and Archaeology 1 of APSARA authority, in collaboration with the National University of Singapore, with support from the Lee Foundation, conducted an archaeological excavation at the Thnal Mrech Kiln Site. This excavation was designed to build a better understanding of Cambodian ceramic technology, particularly in the Angkor era when the so-called Kulen ware was developed. Another

goal was to create a preliminary classification and typology of ceramics recovered from each kiln located at TMK.

The excavation uncovered ancient structures belonging to two different phases. Part of the site consists of an early kiln structure (TMK 02a, 2.90 m wide, with a remaining length of 2.5 m) over which another kiln was built at a subsequent time (TMK 02b, with a ground plan measuring 5.7 m length and 3.6 m wide). Charcoal samples collected from this kiln yielded absolute dates which suggest that TMK 02 was in use during a period of approximately fifty years, in the early eleventh century.

A total of 10,009 artifacts weighing 388.83 kilograms were recovered from this excavation. All the artifacts can be classified according to Khmer linguistic terms for ceramics, defined by both shape and function, such as Kpoeung, Danlap, Koth, Khuoch, Krala, Phoeng, Peang, Ak kambor, Ka-am, Chhnang, Chan, and unidentifiable pieces.

The kiln structures and large quantity of artifacts uncovered from TMK 02 provide important new data on Khmer ceramic technology, leading to an improved understanding of this ancient Khmer industry.

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#### **“The reconstruction of Thnarl Mrech kiln”**

In January 2007, the Department of Monuments and Archaeology 1 (DMA 1) of APSARA authority inaugurated a collaboration with the National University of Singapore (NUS) to conduct an archaeological excavation of Thnarl Mrech Kiln (TMK) sites.

The reconstruction of the kiln was undertaken by the NCKCR in collaboration with the excavation team. This reconstruction, using the same setting, together with the same raw materials, allows us to better understand the construction techniques and challenges of ancient Khmer potters. Furthermore, its use will offer us a complete understanding of ceramics techniques from “Kulen Wares”.

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#### **“Antiquities theft and sustainable development”**

The theft of antiquities has resulted in the loss and destruction of many cultural treasures. Much has been done in the way of creating legislation in order to safeguard cultural heritage and material remains. This legislation has resulted in the repatriation of a large amount of material culture back to the country or culture of its rightful heritage and provenience. Regardless of the many successes, there still exists an underlying reason as to why rare art and collectibles are so aggressively sought by both art thieves and private collectors alike. Until this issue is addressed and the underlying causes mediated, we will continue to witness illegal trade in both antiquities and art. There are two distinct and separate causes for the illegal theft and trade in stolen or looted art.

There is of course an economic imperative and also a social variable. Socially, humans wish to acquire items that enhance their own prestige among their friends and subordinates. It is a simple display of conspicuous consumption. It is my opinion, that if there is a way of eliminating the prestige of owning stolen art then the entire system of art theft will begin to decay. It is within our power as anthropologists, art historians, academics, and museum curators, to provide the methodology by which it will no longer be profitable or advantageous to either possess or trade in stolen artifacts.

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### **“Memotien pottery and other ceramic objects”**

The study of pottery is a very important subject in the archaeological field, and gains more and more interest from different scholars outside and inside Cambodia in present times. During the last century many articles were published on the pottery industry in historical Khmer society. Yet, most works were only concerned with pottery from Angkorian or post-Angkorian periods, mainly glazed stoneware ceramics, which was burnt at high temperatures. In contrast, the study of Cambodian pottery from prehistoric times has not been taken into consideration until recently due largely to the lack of archaeological evidence and the fact that most of prehistoric ceramics are in a fragmentary state and poorly preserved.

. The vessels from circular earthwork sites, which were fired at low temperatures, are very fragile and break easily. The often small fragmentation makes the study of the original complete form of a pot very difficult, but it is possible to compare parts of vessels like rim fragments, base fragments, body fragments and decorations which are still visible on shards.

This study will concentrate on pottery, the forms and decoration, and other ceramic objects were found during the excavations from the Memotien context.

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### **“Circular earthworks’ potsherds”**

Potsherds are one of the main archaeological remains from Circular Earthwork sites (Banteay Kou). Usually, the earthenware pottery was fired for a short time at lower temperatures (the potters in the province of Kampong Chhnang always fire their pots for more or less one hour); thus the pottery from the Banteay Kou are more exposed to destruction, especially in highly acidic soil. On nearly all potsherds of the Groslier collection, the surfaces (inside and out) are destroyed, so it is difficult to examine the original surfaces, slip or smoothing techniques (slip is a creamy “batter” of clay, which acts as a cover when the pieces are baked, or fired). Heng, Heang and Som in 1999, defined three types of temper material which were mixed with the clay; organic material; such as rice husk, straw, or charcoal; white sand which consists of feldspar; and red sand or fine grains of laterite. These materials are visible to the naked eye. The

examination of the potsherds in the Groslier collection shows that more organic material is recognizable than red and white sand (see Heang Lean Hong, 1999).

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**“A pilot study of elemental analysis on Angkorian ceramics”**

Elemental analysis of ceramics has become an increasingly popular tool in the studying of production, contact and economy in past societies. With the recent excavation of an kiln site in the Kulen plateau a small pilot study was conducted on the excavated material including glazed covered boxes, roof tiles, kiln supports and earthenware. The results of the elemental analysis, which included major, minor and trace elements, are compared to those obtained from surface sherds collected from a kiln site at Beng Kong, near Roluos. While small in scale this study serves as an initial assessment of the feasibility of further ceramic analytical study in the area and provide some insight in the production aspect of ceramics in the Angkorian period.

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**“When Khmer met Chinese ceramics: Traditions and technological choices of ancient Khmer stoneware”**

How did ceramics traditions occur? They occurred when indigenous techniques coexisted with incoming techniques. When contemporary potters work in the revival of ancient Khmer ceramics production techniques, what ceramic traditions do they want to reconstruct? Archaeological finds in Angkor show that one of the imported ceramics, Chinese ceramics are widely distributed in different inhabited sites and usually coexist with Khmer ceramics. We would become aware that Chinese imported ceramics would have more or less interacting relations with Khmer ceramics production, especially on production techniques of ancient Khmer stoneware. On the other hand, Archaeological evidences from Khmer kiln excavations indicate that some shapes, forms and decorations of Khmer stoneware are quite similar to Chinese ceramics. However, comparing with Chinese ceramics kiln technologies, Khmers seem to have a wide range of very different techniques on kiln constructions, stacking methods etc. In this paper, first, we will compare the differences and similarities on shaping, decorative methods and kiln technologies of Khmer stoneware and Chinese ceramics, so as to study how Khmers made their technological choices on producing ancient Khmer stoneware and how they dealt with the adoption or rejection by society which result in this selection. Second, to what extent did Khmer stoneware inspire Chinese potters in their ceramics production? Recently archaeological evidences in southern China may provide some hints to study the ceramics traditions of Khmer ceramics.

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During the conference, Michael DeLarwelle ceramic artist and teacher from Western Australia will be bringing an electronic collection of an extensive set of ceramics photos from museums and exhibitions around the world, including those from Xian and Beijing in China. Michael has kindly offered to make these available to view during the conference.