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Khmer Potters Emerge from the Shadows: Thnal Mrech and Bangkong Kiln Sites

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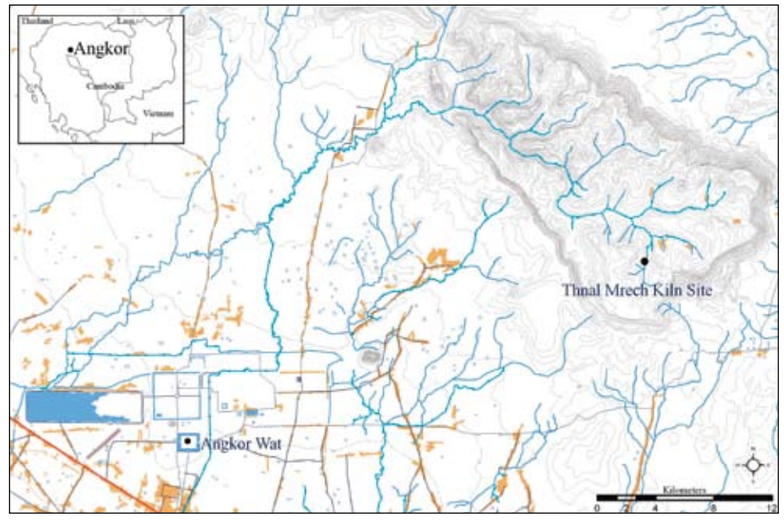
Khmer Potters Emerge from the Shadows: Thnal Mrech and Bangkong Kiln Sites

Interest in research on Khmer pottery production has been increasing. **John N. Miksic** and **Chhay Rachna** report on discoveries on two sites in Angkor, Cambodia

It seems likely that the Khmers first began to produce glazed ceramics around 1000 CE. The existence of kilns on Phnom Kulen was first noticed over 100 years ago, but research on pottery production had a low priority for archaeological researchers. The situation has changed radically in the past decade. The first generation of Khmer archaeologists, in particular, has taken a strong interest in this subject. Two important sites, Tanei and Thnal Mrech, have been excavated and published in detail. A third site, Bakong, near the temple of that name in Roluos, was excavated in January 2008. Although our sample size is too small to draw firm conclusions from these results regarding the course of Khmer ceramic evolution, knowledge of this subject has made a quantum leap compared to the state of the field in 1998.

Thnal Mrech map



The Thnal Mrech Kiln site (TMK) – Thnal Mrech literally means 'road of pepper' – is located on Phnom Kulen, approximately 35 km northeast of Siem Reap in the Angkor region of Cambodia. Radiocarbon dating of one kiln yielded five dates which cluster in the early 11th century (reign of Suryavarman I). This is one of many similar sites near the village of Anlong Thom (meaning approximately 'big river channel'). Other data indicate that the site was occupied for some time, possibly until the 13th century. There are indications of evolution at the site of kiln structure, engineering, and use.

Historians believe that Phnom Kulen was known as *Mahendraparvata* in the past (Coedès 1968). The Sdok Kak Thom inscription (K.235), composed in 1052 CE, suggests that *Mahendraparvata* was once the capital of Jayavarman II after liberation from "Java" (Coedès 1964). Along with temples and religious foundations registered in the area, ceramic kilns were recognised during a survey in 1883 (Aymonier 1901).

B.P. Groslier identified a ceramic type, which he called Kulen Ware (Groslier 1981), based on stratigraphic analysis of various excavations in the Angkor region. He suggested that Kulen Ware might date back to the ninth century, contemporary with the reign of Indravarman, founder of the Bakong temple in the Roluos group, southeast of the larger Angkor complex. Until January 2007, there were no systematic research projects conducted to understand kiln sites on Phnom Kulen.

In 1995, the APSARA authority in cooperation with Sophia University conducted the first research on Khmer kiln technology, at the Tani kiln site, approximately 19 km from TMK. In August 1999, a short site reconnaissance was undertaken by APSARA, Nara National Cultural Properties Research Institute, and Sophia University (Nishimura 2000, Nara-APSARA 2000). However, numerous visitors such as officials of NGOs based in Siem Reap were only interested in visiting and collecting wasters from these kilns, and did not produce any reports or analysis. Since then, several research projects and theses by students at the Royal University of Fine Arts (Phnom Penh) have been dedicated to the study of ancient Khmer ceramics. Cambodian kilns which have been systematically investigated include Tani, Khnar Po, and Sarsei, all located near Phnom Kulen (Ear 2000, Nara 2000, Sophia 2000, Chhay and Chap 2002, Sok 2003, Em 2004). One thesis, defended in 2002 by Chhay Visoth and Chap Sopheara, is dedicated to identification and classification of ceramics found *in situ* at TMK. This thesis relies mainly on wasters found in surface scatters, as well as remains from looting in the early 1990s.

In January 2007, the Department of Monuments and Archaeology 1 (DMA 1) of the APSARA authority in collaboration with the National University of Singapore (NUS) conducted an archaeological excavation of TMK sites. This excavation was designed to build a better understanding of Cambodian ceramic technology in the Angkor era. Another goal was to create a preliminary classification and typology of ceramics recovered from each kiln located at TMK. A second excavation was carried out concurrently at TMI 1 by another team from APSARA and a Japanese archaeologist (Tabata and Chhay Visoth 2007; Miksic, Chhay Rachna, Heng Piphal, and Chhay Visoth 2009).

The excavation was conducted with the aid of a computer-generated contour map based on surveys in January and May 2006, analysis of which made it possible to divide the kiln structures located on Thnal Mrech into two groups, northern and southern. The results of this survey caused the investigators to suspect that possible kiln structures

Firebox of Thnal Mrech kiln

are located on both sides of the dike which penetrates a peninsula-like area. The main objective of the excavation was to identify elements of a kiln structure, including ground plan, location and dimensions of such features as the walls, floor, roof, firebox, etc., as well as artefacts associated with each of these features. The excavation of Tani and Thnal Mrech 01 provided a preliminary idea of what the Thnal Mrech 02 kiln might look like.

Informants reported that this area had been heavily looted during the 1990s. The site is riddled with dozens of looted pits with kiln structure fragments and ceramic fragments present on the surface. However one mound remained in good condition, suggesting that one or more undisturbed kilns might be located there. A broad trench was excavated to reveal the kiln structure. The east side of this unit was found to constitute the front end of the kiln, where the firebox was located. There were remains of a collapsed roof structure, composed of chunks of burned clay mixed with soft dirt, forming a flattened layer of burned clay all over the unit, but no trace of any chimney was present.

Thnal Mrech kiln 2 top view

After drawing, the roof was removed and two modified kiln structures and a floor with multiple steps, including a firebox, were uncovered. The upper part of the kiln turned out to be the remains of an early kiln structure (TMK 02a) which was later modified/enlarged (TMK 02b). Both of these kilns display a strange irregular shape which differs from TMK 01, Tani, Sasey, and Boriram. These two stages of TMK 02 do not exhibit the expected elongate oval shape; instead they describe a combination of oval and rectangular shapes. Excavation of the floor suggests at least two distinct phases. During its final usage, the kiln floor comprised twelve steps of irregular height and width, made of recycled firing supports and plastered with clay bands to form level platforms. TMK 02 is one of the biggest kilns yet found in the Angkor region. It is assumed that potters exploited the slope of a pre-existing dike, Thnal Mrech, to build a cross-draft structure.

Qingbai from Thnal Mrech

Thnal Mrech surface finds

Charcoal samples collected from multiple layers in front of the kiln produced a series of consistent dates ranking from BP 970 (±30) to 05 (±30). Highest probabilities of the dates rank from:

- AD 1016-1157 (96.5%): sample recovered from layer 4c.
- AD 1022-1166 (97.2%): sample recovered from layer 4c.
- AD 1025-1208 (98.7%): recovered from layer 6b in the extension unit.
- AD 1027-1211 (99.2%): recovered from layer 3a
- AD 1031-1215 (99%): recovered from layer 5.

These absolute dates suggest that TMK02 was in use during a period of approximately fifty years, in the early 11th century CE. Only one piece of Chinese ware (qingbai), most probably associated with habitation, was recovered on top of the collapsed kiln roof.

Artefacts and Classification

Kiln products can be divided into many categories, including supports for stacked firing, roof tiles, restricted-neck jars, small restricted-neck 'jarlets', and covered containers. Some of the covers fit within the body using an inverted rim, and others overlap the external body rim. The total number of sherds found was 10,009; these weighed 388.8 kilograms. Ceramics obtained from the excavation contain both glazed and unglazed stoneware and earthenware. Glazed wares represent the highest concentration of the total assemblage. Earthenware comprises mostly cooking pots and large containers. A majority of the stoneware was possibly fired between 900 to 1200 degrees Celsius.

Most of the forms of ceramics found in the kiln are still known by locals, and Khmer words for them exist (Chuon 1967). This enables us to produce a trial classification scheme of Kulen wares based on Khmer terms. An artefact classification system using Chhay and Chap (2002) has been developed. Other sources utilized include Ear 2000, Sok 20003, and Em 2004. We are also attempting to reconstruct the evolutionary trajectory of the vessels through basic seriation techniques.

Bangkong bulldozed

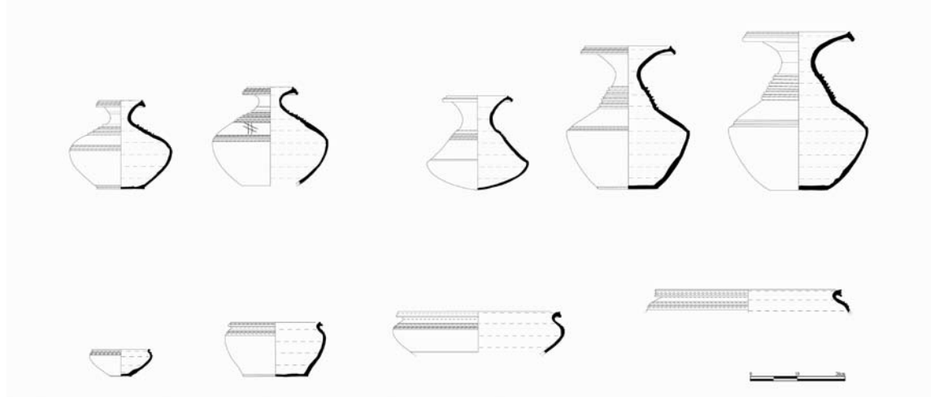
Khmer linguistic and cultural categories are rich in ceramic types. For example, the *danlap* – in modern context – is a small vessel in which to store bees' wax which was often used in black magic (a shaman may put a spell on the wax and container). Only men can touch them. Females might be harmed or driven mad if they touch these vessels. Angkorian inscriptions use the term *'tanlap'* mostly to refer to examples made of gold and silver (Coedès 1951 and 1954). K391 *"…vrah gandha tanlap mvay…"* indicates that *danlap* could have been used as perfume containers. Unit H yielded large covered containers of this shape. This term can be applied to both large and small covered boxes. Their use in antiquity is unknown, but the same forms and concepts adhere to modern contexts.

Kilns on Thnal Mrech are mostly built on an artificial embankment, thereby exploiting its slope. Other kiln sites found in Angkor are also built on embankments, such as at Sarsey, Khnar Po, and Tani. Conversely, Bangkong and one of the Sarsey kiln group were built on mounds in flat areas near river channels and ponds. Tani kiln B1 shows a similar cross-draft structure to TMK 02 (Aoyagi et al 2000). The structure of TMK 02 is considerably different from that of kilns in Buriram. Chinese influence of the Dragon Kiln on the structure of TMK cannot be verified due to limited research. The structure could be merely the result of internal evolution from previous periods, external influence, or a combination of both; this is the same concept as represented by Khmer temple construction. Some green glazed sherds collected from the Bangkong kiln group yielded higher quality clay, glaze, and firing technique than ceramics from TMK 02. On the other hand ceramics uncovered from Tani, Sarsey, and Khnar Po are of inferior quality to TMK ceramics (Sophia 2000, Sok 2003, Em 2004).

Bangkong kiln firebox

Bangkong Kiln Site

Roluos was a temple complex and probably a royal capital for most of the 9th century, before major construction began at the modern site of Angkor. Surface survey located 39 kilns at Bangkong, about 4 km north of the temple known as Bakong. At the end of 2007, the government started to build a "development centre" on top of this kiln complex. Out of the 39 kilns identified through surface survey, two which were still partially preserved in January 2008 (designated Kilns 15 and 16) were excavated. One of these yielded a radiocarbon age of 1107 ± 20 BP [68% confidence interval 898 AD to 922 AD (28.6% of area), or 943 AD to 975 AD (38.7% of area) or at the 95% confidence interval 893 AD to 985 AD (95.4% of area) (NZA 29792 Institute of



Bangkong Kiln 15 Khuoch Ka-am and Phoeng or Peang

Phoeng and Peang Khuoch

Geological and Nuclear Sciences Ltd/Rafter Radiocarbon Laboratory, New Zealand).

Shapes of artefacts recovered from the excavation include *chan* (bowl or plate) and *krala* (ovoid shaped jar, big or small, mainly used for storage; very large ones are called *phoeng*, *peang*, and *ka-am*). Artefacts collected from the surface of BKK 12, which had been bulldozed, include *danlap* and *kotth* (literally 'urn used to store cremated ash'). Groslier reported finding identical containers with human remains in an excavation at Srah Srang (Dumarçay and Courbin 1988, Brown 1988). That usage of these containers was restricted only to burial cannot be confirmed. In modern Khmer practice, human relics can be stored in any type of container, including bowls, teapots, metal urns, etc.. Bas-reliefs on the Bayon seem to show this shape serving to contain food rather than human relics. This

Ka-am

shape is reminiscent of the *danlap* with the exception of its half-conical or cylindrical form.

Another form is the *khuoch*, generally translated as 'bottle'. "Small, globular vessel with restricted neck and everted rim" is a more accurate description than bottle. This shape suggests that it was used as a liquid container. Khmer currently identify these as containers for oil (perfume).

Unfortunately, we are unlikely ever to know more about this extensive and early industrial site from the very beginning of the Angkor period. Fortunately, at least the bare bones of the story which has now been erased from existence forever have been preserved.

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Chhay Rachna, born in Cambodia in 1978, is an archaeologist with the APSARA Authority in Siem Reap. He specializes in the study of ancient Khmer ceramics, and is also interested in ethnoarchaeology, especially the continuity between ancient and modern Khmer ceramic terminology and use.

John N. Miksic, born in the USA in 1946, is an associate professor in the Southeast Asian Studies Programme, National University of Singapore. He has worked on Southeast Asian and Chinese ceramics since 1976. His research interests include ancient technology transfer, urbanization, and trade.

Photographs: John N. Miksic
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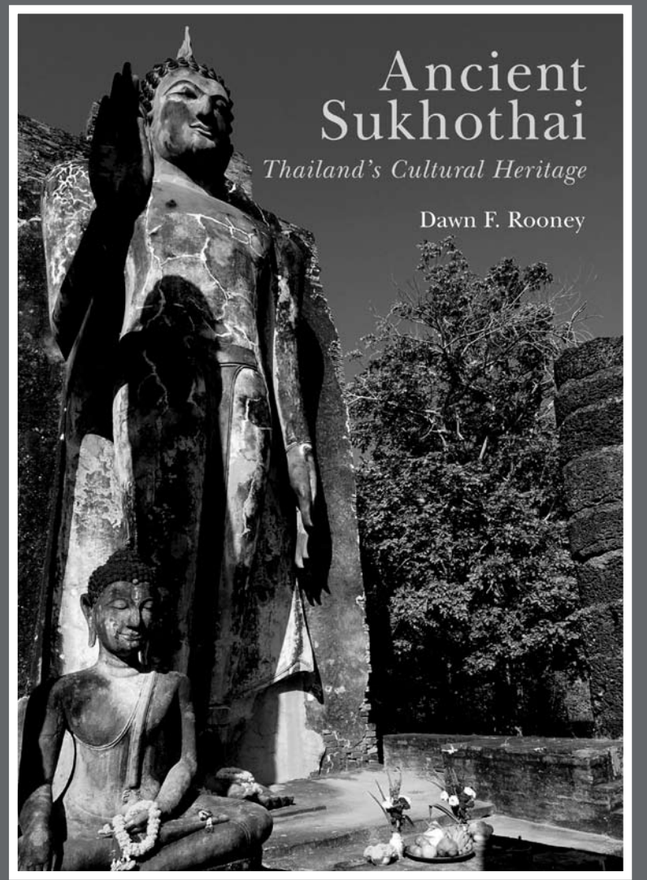

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'This guide covers the history and art of the early Kingdom of Sukhothai, which was situated in the fertile Yom River basin of north-central Thailand and is renowned for artistic achievements in the mid-thirteenth and fourteenth centuries. Influences from earlier inhabitants of the area and neighbouring kingdoms were overlaid with Theravada Buddhist ideas from Sinhalese culture to create a unique style that is recognised today as 'classic' Thai art. Beautiful remains of this period can be visited at Sukhothai, Si Satchanalai to the north and Kamphaeng Phet to the southwest. Lotus-bud spires, delicate stucco decoration, pillared foundations, huge Buddha images encased in niches and secluded forest monasteries atop surrounding hills testify to the original expression of Sukhothai artisans. The author takes the reader on a journey to the early Kingdom of Sukhothai and explores the remains and cultural heritage of this sacred site.

About the Author

Dawn F. Rooney, PhD, is an independent scholar and an art historian specializing in Southeast Asia. She is a fellow of the Royal Geographical Society and the Royal Asiatic Society in London, an advisor to the Society for Asian Art Museum in San Francisco, the Thailand representative for the International Map Collectors' Society and the Regional Director, Southeast Asia for Independent Scholars of Asia. Dawn Rooney is the author of several books on the culture of the region including a definitive guide to Angkor. She was awarded a Scholar in Residence at The Rockefeller Foundation Study Center in Bellagio, Italy in 2002 where she wrote her latest book, Thai Buddhas (Bangkok, River Books, 2003). She is an American who has lived in Asia for over three decades and resides in Thailand.

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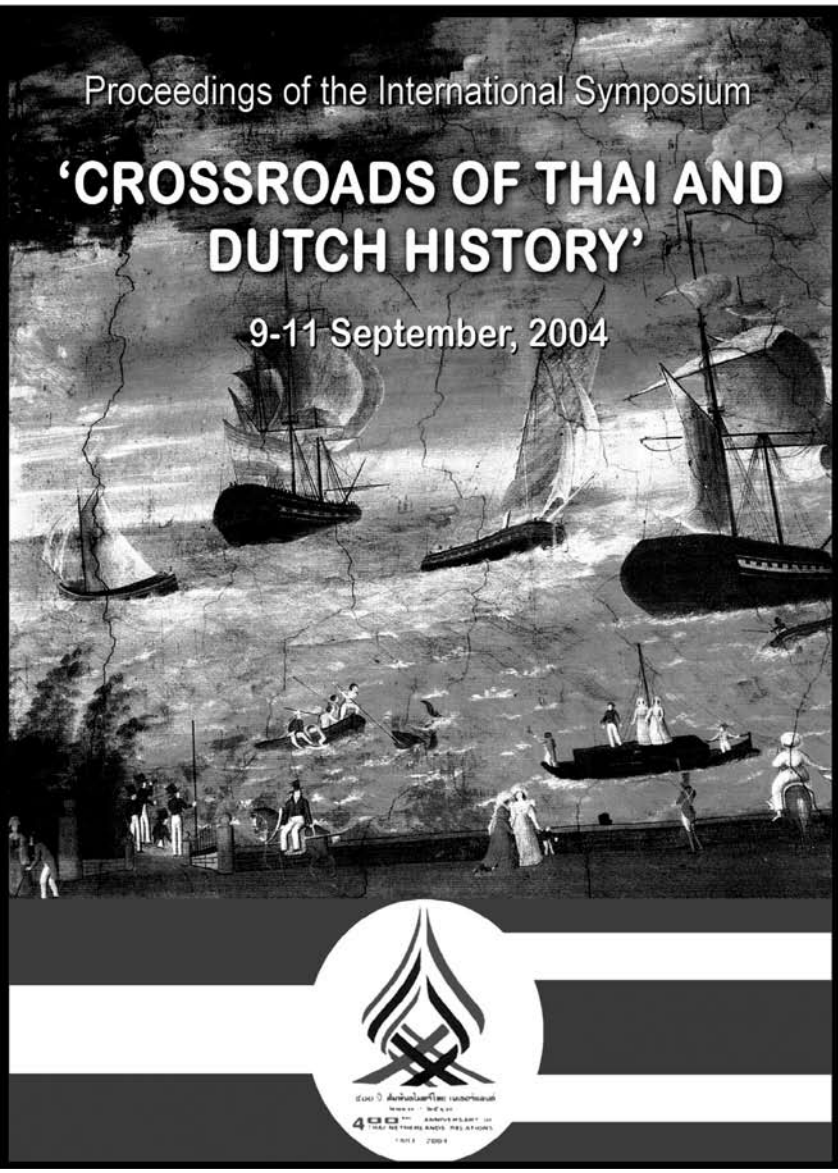

Re-exploring and highlighting the process and the historic development of Dutch-Thai relations, along with a re-examination of the underlying circumstances and surrounding contexts.

This volume of the proceedings of the international symposium, 'Crossroads of Thai and Dutch History', has been published by SEAMEO-SPAFA.

The papers were presented at the symposium by scholars of Thailand and the Netherlands, as well as others of international repute. They discuss new evidence, explore new channels of research, and also provide new interpretations of known sources.

Some of these papers are splendidly finished results of long-term research, while others are new and fresh, even challenging presentations prepared specially for this symposium.

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Rediscovering the Capital of Majapahit

Mystery has surrounded the exact location of the 14th century Javanese royal palace of Majapahit and the lay-out of its outlying city, the last Hindu-Javanese capital. As a symbol of a potent pre-colonial state, the site of Majapahit has been left neglected for centuries, seen as too politically sensitive to be preserved by the Dutch colonial government. Now, with revolutionary technology and a rediscovered map at their disposal, **Amrit Gomperts**, **Arnoud Haag**, and **Peter Carey** have pinpointed the royal site in the hope that the Indonesian people and their government will invest in its preservation.

The Republic of Indonesia partly bases its claim to national unity on the last Hindu-Javanese kingdom of Majapahit (1293 - 1510s). The first king, Wijaya (reigned 1294 - 1309), began the construction of the royal palace of Majapahit in present-day Trowulan, some 55 kilometres southwest of Surabaya, on the eve of the Mongol-Chinese invasion of Java in 1293. In the second quarter of the 14th century, the famous Prime Minister Gajah Mada (in office 1331 - 1364) initiated an expansionist policy. This enabled the Hindu-Javanese kingdom to exert its political influence beyond Java to other parts of the archipelago from the Malay Peninsula to present-day Papua. The kingdom fell into decline in the early 15th century.

Throughout the entire colonial period (1619 - 1942), the Dutch were aware of Majapahit's imperial legacy – a form of pre-colonial Javanese state which continued to cast its long shadow over the Dutch-governed East Indies: the Java War (1825 - 1830) leader, Prince Diponegoro (1785 -1855), for example, referred to its possible revival as a 'great and mighty empire' as he sailed along the islands in the eastern archipelago on his voyage into exile in Sulawesi in May - June 1830 (Carey 2008: 590). So potent was Majapahit's historical image that no colonial government was willing to facilitate its revival. This was particularly the case in the early 20th century, when early Indonesian

nationalist leaders, who understood the need for nation-states to use historic symbols for the legitimation of their cultural and national identity, began to use Majapahit as a claim for Indonesian sovereignty over the Dutch-controlled archipelago. When Sutan Sjahrir (1909 - 1966) addressed the UN Security Council at Lake Placid in New York State on 14 August 1947, he referred explicitly to Sriwijaya and Majapahit as the historical forerunners of a united Indonesia. After Indonesia's independence in 1945, Majapahit became the symbol par excellence of the young republic's territorial integrity. Today, Trowulan is often visited by high-ranking Indonesian politicians and army officers for the purpose of meditation at the Hindu-Javanese ruins. The powerful associations linked to the name 'Majapahit', however, stand in sharp contrast to the status of the present-day remains of the vanished court-city. Nowhere is the statement 'archaeology is politics' more valid than in the case of Majapahit.

Although nearly everyone in Indonesia is convinced that the Majapahit capital was situated at Trowulan, archaeologists still argue about the exact location of the royal palace and the lay-out of the surrounding city. We, the authors, started our research by posing the following question: where exactly was the Majapahit royal palace situated? We decided to adopt simple but classical archaeological methods: reading Javanese texts, consulting a wide variety of cartographic sources and interpreting what remains in situ in the present-day Trowulan landscape. We were able to benefit from technologies which have revolutionised our knowledge of the world in the past decade: the GPS satellite positioning system, GIS (Geographical Information Systems) software, and Google Earth. Moreover, during the course of our research, the possibility gradually dawned on us that the exact location of the royal city may have already been indicated by the Dutch archaeologists of the Netherlands East Indies Archaeological Service (Oudheidkundige Dienst). Even so, we had to prove it. Adopting the systematic approach of a critical review of existing scholarly literature, we came across a few anomalies and surprises. This short communication gives a summary of findings presented in our recent articles (Gomperts et al. 2008a, 2008b, 2010 forthcoming, Gomperts 2010 forthcoming).

Nowhere is the statement 'archaeology is politics' more valid than in the case of Majapahit

The 'lost' map found

Interest in the archaeology of the vanished 14th century royal city of Majapahit really started during the British occupation of Java (1811 - 1816) when Lieutenant-Governor Thomas Stamford Raffles (1781 - 1826; in office 1811 - 1816) ordered the Dutch army surveyor, Captain J.W.B. Wardenaar (- 1869), to make a plan of the site of the ancient royal capital. Although Wardenaar's October 1815 plan was since considered lost, the plan's legend – based on information the engineer captain gleaned from local villagers – and a few drawings with handwritten notes, which were donated to the Batavian Society of Arts and Letters (Bataviaasch Genootschap van Kunsten en Wetenschappen) after Wardenaar's death in 1869, enabled the mining engineer and pioneer of modern volcanology, Rogier Verbeek (1845 -1926), to attempt a reconstruction of the map in 1887.

However, a few uncertainties remained about Verbeek's identifications. It took us two years of research to trace the lost map of Majapahit in the 1939 Drake Collection of the British Museum on 12 March 2008. The map at scale 1:12, 150 shows the location of 15 main archaeological features in the area, including the well-known – and still extant – remains of the Bajang Ratu gate, the Sĕgaran tank, Candi Br ahu and other Hindu-Buddhist sites, as well as a few temples which have since vanished. When we finally projected a digital scan of Wardenaar's plan of Majapahit as a half-transparent overlay over the available high-resolution satellite image of Google Earth, it was a sensation (Wardenaar 1815).

The plan appeared to be geometrically highly accurate, allowing us to georeference – that is, to apply geographical coordinates – with GPS mapping software to an accuracy of 30 - 50 metres and to make an accurate verification of the mapped spots on site with a GPS receiver. From the Plan of Majapahit and the accompanying legend and notes, we were able to pinpoint the location of the vanished royal palace in the hamlet of Kĕdaton – a Javanese toponym which significantly refers either to the private royal quarters in a palace or to the royal palace itself. Also traceable was the place where the Majapahit kings were seated – flanked by four royal elephants – while watching formal festivities held on the great expanse of the large Sĕgaran (literally,

'The Little Sea') tank, the most prominent surviving archaeological site at Trowulan today.

We now possessed a benchmark which allowed us to relate references in Javanese texts to accurate sites on the ground. Furthermore, Wardenaar's plan shows the original position of the statue of Joko Dolog (literally, 'The Fat Youth') which represents a Buddhist Aksobhya (literally, 'The Imperturbable One') with his right hand touching the ground in emulation of the Lord Buddha's classic calling the earth to witness gesture (Fig. 1). The statue was moved to Surabaya in 1817 and its original position was lost. On the basis of the georeferenced position of Joko Dolog's statue on Wardenaar's plan, we were able to identify the exact spot where the statue had stood in 1815. The Buddhist identity of the area is further confirmed by a villager who witnessed the excavation of a large statue representing the Hārītī, the Buddhist guardian goddess of children whom parents of prematurely deceased children worshipped. The Javano-Sanskrit inscription on the pedestal of Joko Dolog's statue refers both to the Buddhist sage Bharada, who is said to have marked the political boundary when King Airlangga (reigned, c. 1019 - 1052) divided his realm into the kingdoms of Janggala (Jīwana) and Pañjalu (Daha), and the consecration of thestatue at the cemetery of Wurare by King Kĕrtanăgara (reigned 1268 - 1292) in 1289.

In the future, we will analyse the archaeological evidence and argue that the position of Joko Dolog in 1815 coincides with the legendary cemetery Wurare (from awu rare, literally 'children's ashes') which was also known as Lĕmah Tulisand Lĕmah Citra (Fig. 2). Moreover, in our view, the statue itself represents the image of Bharada, the legendary figure who presided over the political division of Java in AD 1052, a conclusion also arrived at independently by the art historian, Pauline Lunsingh Scheurleer (personal communication, 10 October 2009).

A Balinese account

18th century Balinese rulers took an active interest in the Majapahit ruins at Trowulan. During the Surapati insurgency (1686 - 1703) and its aftermath up to the time of the 1718 Surabaya War, sizeable Balinese armies were present in East Java. The first ruler of the Balinese kingdom of Mengwi, Gusti Agung Anom, made a pilgrimage to the site of the royal city in 1714. The official historiography of the Balinese court of Klungkung, the Middle Javanese Kidung Pamañcangah, written in the beginning of the 19th century by an anonymous Balinese author, refers to the ancient capital of Majapahit and to several landmarks within the town, most of which can still be identified on site on the basis of Wardenaar's mapping. In reverse order, the Middle Javanese text describes how from north to south the following can be found: the Sĕgaran tank, the alun-alun square, the pangastryan or wanguntur audience-yard, and the royal palace itself. We conclude that, as with Wardenaar's mapping process, the description of Majapahit in the Kidung Pamañcangah relies on an oral tradition, probably based on a Balinese visit to Trowulan in the 17th or early 18th century (Gomperts 2010).

Fig 1: The statue of Joko Dolog, portraying Bharada, the mythical figure who – according to the tradition – drew the dividing line between the kingdoms of Janggala and Pañjalu in 1052.

Stutterheim's work

During the Dutch colonial assault on and sacking of the Balinese court of Cakranĕgara in Lombokin 1894, the scholar J.L.A. Brandes (1857 - 1905) managed to save the Old Javanese text Nāgarakĕrtāgama. In the text, the court poet Prapañca describes the lay-out of the Majapahit royal palace and city a few years before 1365. Ever since Brandes' discovery, the archaeological identification of the Majapahit royal palace has focussed on the textual exegesis of Prapañca's intricate formulation in the Old Javanese language. To date, at least eight different translations and several reconstructive mappings of Majapahit have been published on the basis of this text. However,

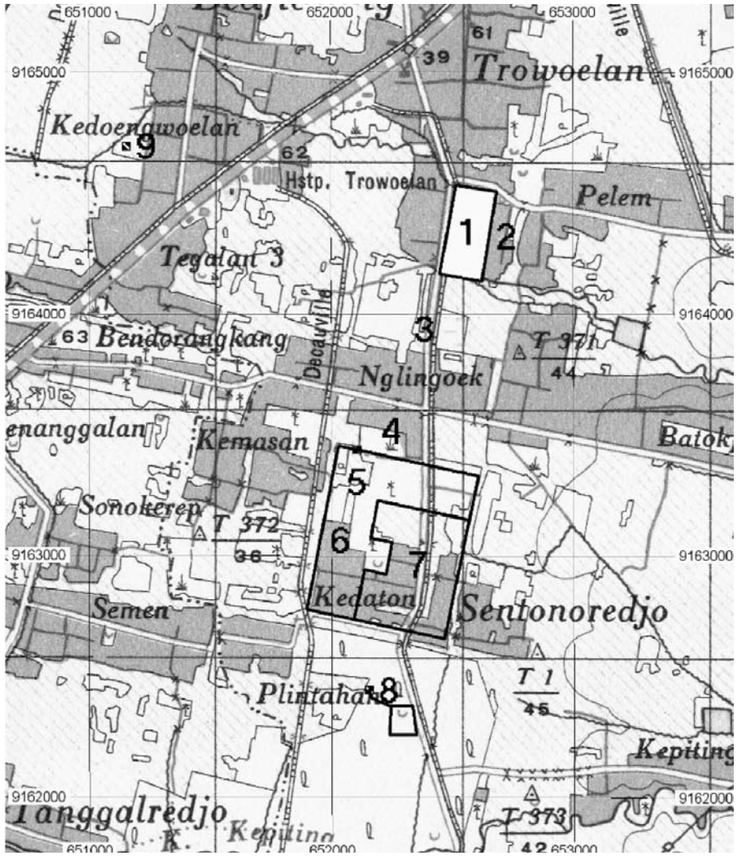

Fig 2:
A few important sites in the 14th century Majapahit royal capital drawn on a 1941 topographic map:
1. Sĕgaran Tank
2. Market
3. Large square or alun-alun
4. The wanguntur or pangastryan audience-yard
5. Palace-gate
6. Royal palace
7. Area of the private royal quarters in the palace
8. Islamic graves of members of the Majapahit royal family at Troloyo cemetery
9. The statue of Joko Dolog at the former Buddhist cemetery of Wurare.

Prapañca's description is couched in such arcane Old Javanese that the differing spatial interpretations based on his text have only served to confuse Trowulan archaeology. In our view, both Wardenaar's mapping and the description in the Kidung Pamacangah are sufficiently reliable and detailed for the identification of the site of the royal palace. In July 1941, the Dutch archaeologist W.F. Stutterheim (1892 - 1942) wrote a review of all the available interpretations. This posthumously published monograph (Stutterheim 1948) provided the most realistic translation and interpretation of Prapañca's text. Indeed, as soon as we had projected Stutterheim's reconstructive plan on several maps with GIS software, it became apparent that he had plotted his plan on topographic maps of the area, and had a definite location of the palace in mind when he finished his draft monograph (a later version of which was completed in February 1942 just before the fall of the Netherlands East Indies to the Japanese). Hence, without explicitly saying so, Stutterheim based his interpretation of Prapañca's description on an archaeological analysis of the remains and landscape of Trowulan (Gomperts et al. 2008b).

Moreover, the eight-pointed aureole is the emblem of the Majapahit royal family. It is depicted on several Islamic graves at the cemetery of Troloyo. Stutterheim (1948:105, n.246) rightly concludes that these graves belong to members of the Majapahit royal family who adopted Islam from the 1370s. The close proximity of the Troloyo graves to the royal palace on the map underlines the importance of the new religion, Islam, at the end of 14th century Majapahit (Fig. 2).

Thus, we now possess three different sources – Wardenaar's plan, the description in the Kidung Pamañcangah and Stutterheim's monograph - which all independently and unambiguously situate the vanished royal palace in the hamlet of Kĕdaton.

During the course of our identification of the location of the Majapahit royal palace, we also discovered a few small errors in Stutterheim's translation of Prapañca's text. These have quite important spatial implications for the lay-out of the royal city. For example, remains of outer and inner palace walls marked on the archaeological maps and still extant in the 1920s allow us to determine the exact footprint of the vanished royal palace as well as the position of the market. The total length of the outer palace walls appear to have measured some 2.5

kilometres in circumference. Therefore, we conclude that the Majapahit capital had a much smaller royal palace than those of the mid 18th century central Javanese courts of Yogyakarta and Surakarta. Indeed, our map shows almost the entire area of the Majapahit capital in the 14th century (Fig. 2). From the area on our map and the population densities, we are able to estimate that the capital had a population not exceeding 25,000 inhabitants.

Site destructions

The first British Resident of Japan (Mojokĕrto) and Wirasaba (Mojoagung), Lieutenant H.G. Jourdan, completed his report of the area in April 1813 following the British annexation (Jourdan 1813 : 352 - 64). In his report, we find reference to the production of bricks. Several 19th century Dutch reports mention the massive clearance of brick remains from grounds, cadastrally allocated to colonial entrepreneurs in the sugar industry. Indeed, anyone who visits Trowulan today will be able to witness that the tradition of brick-making still remains central to the local economy of Trowulan.

However, the process of removing top-soils for on-site fabrication of commercial building bricks in improvised pits has now reached industrial levels as the high-resolution satellite imagery of Trowulan available at Google Earth testifies. On the basis of a number of small-scale topographic maps, observations on site and digital elevation models (DEM) projected over historic maps, the scale of site destructions and removal of soils is immediately apparent. We estimate that at least 20 million cubic metres of soil with brick remains have been removed since Wardenaar's plan was made in 1815. In fact, major parts of the foundations of the palace walls still extant in the 1920s have vanished since the 1980s. The demolition of medieval brick-walled wells happened before our very eyes when we visited the site in mid December 2008.

All this is a direct consequence of the fact that the Oudheidkundige Dienst – perhaps under pressure from local Dutch sugar estate owners – never implemented policies for protecting the Majapahit remains in Trowulan. Dedicated and professional archaeological excavations are more necessary than ever at the present time. For example, the local farmer, who owns the land at the spot where Stutterheim identified the palace gate, recently informed us that substantial brick foundations exist there. We also recommend a professional excavation of the site of Joko Dolog before local treasure hunters destroy what is left of the once legendary cemetery of Wurare. The implementation of a robust regime of archaeological site preservation is imperative to ensure that future generations of archaeologists are not deprived of access to the glory that was pre-colonial Java.

Concluding thoughts

We have now reached the end of this short communication. May it inspire the Indonesian authorities and its talented people to a better appreciation of their historical heritage, and encourage them to save as much as possible for posterity. As former President Sukarno so frequently observed: no nation can survive without a knowledge of its historical past. Majapahit embodies in its urban archaeology the transition from Java's Hindu-Javanese past to the modern Islamic society of present-day Indonesia. The 14th century city was not only the last Hindu-Javanese capital, it was also the first urban community where members of a Javanese royal family adhered to the new Islamic faith. The royal capital thus marks the intersection of Indonesia's modern age.

The implementation of a robust regime of archaeological site preservation is imperative to ensure that future generations of archaeologists are not deprived of access to the glory that was pre-colonial Java.

Acknowledgements

We would like to express our deep gratitude to the Bupati of Sragen, Mr Untung Wiyono, for his sponsorship of our research; the historical anthropologist Dr Roy Jordaan; and the art historian Drs Pauline Lunsingh Scheurleer (formerly Rijksmuseum) for their assistance in the writing of this communication.

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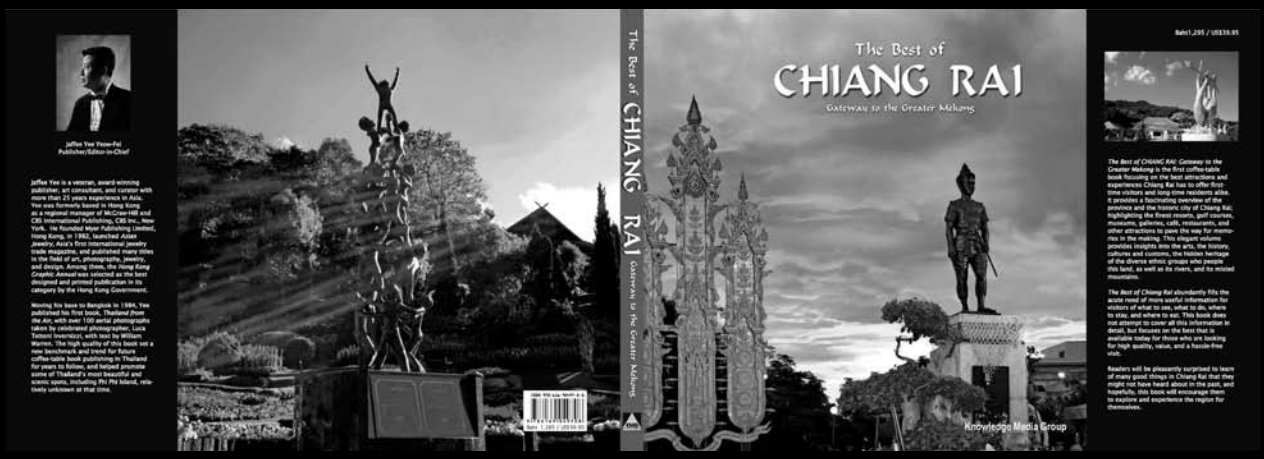

Book Information

Title: The Best of CHIANG RAI – Gateway to the Greater Mekong
Format: 250 x 250 mm
Number of pages: 120
Illustrations: Over 200 color & black & white photos by top professionals
Binding: hard cover with dust jacket
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The Best of CHIANG RAI: Gateway to the Greater Mekong is the first coffee-table book focusing on the best attractions and experiences Chiang Rai has to offer first-time visitors and long-time residents alike. It provides a fascinating overview of the province and the historic city of Chiang Rai; highlighting the finest resorts, golf courses, museums, galleries, cafés, restaurants, and other attractions. This elegant volume provides insights into the arts, the history, cultures and customs, the hidden heritage of the diverse ethnic groups who people this land, as well as its rivers, and its misted mountains.

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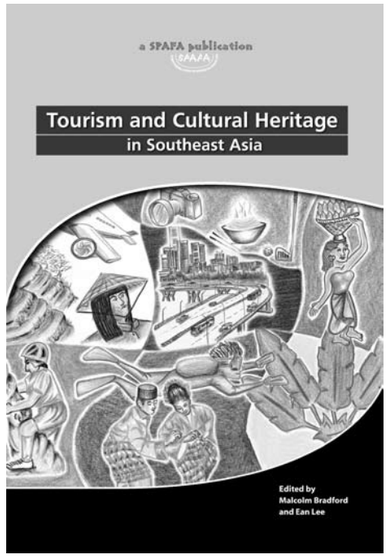
Readers will be pleasantly surprised to learn of many good things in Chiang Rai that they might not have heard about in the past, and hopefully, this book will encourage them to explore and experience the region for themselves.

Tourism and Cultural Heritage in Southeast Asia



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Ancient Glass from the Silk Road

Brigitte Borell finds a most welcome English edition of a collection of papers presented at a series of symposiums and workshops in 2004 and 2005, previously published in Chinese. The 24 papers, each one a chapter in the book, are written by scholars from China, Japan, Korea, Uzbekistan and the US, and they reflect the newest research in the field of scientific and archaeological studies on ancient glasses in Eastern Asia

Fuxi, Gan, R.H. Brill & Tian Shouyun, eds. 2009. Ancient Glass Research along the Silk Road. Singapore: World Scientific Publishing. 473 pages, ill., maps & tables. ISBN 978 981 283 356 3

The majority of the papers in this volume originate from the field of archaeometry – the application of scientific techniques to the analysis of archaeological material, in this case ancient glasses. The compositions of glasses vary in terms of period and region, and the study of their chemical compositions has proved to be an important and useful tool. The categorisation of ancient glass into different glass families or glass systems is based mainly on the intentional use of different fluxing agents in the primary process of making glass. These fluxes offer valuable information about the period and region in which a glass originated. It may also allow important conclusions about trade and trade routes. The basic distinction of glass families may be further refined through studies of trace elements, lead-isotope analyses and strontium-isotope analyses, which provide a valuable supplement for classifying glasses according to geographical origin (chapters 3 and 4 by Robert Brill).

Space does not allow a review of each of the contributions in detail. Where it seems appropriate, some of the chapters will be outlined together in a larger thematic context.

The first two, rather substantial, contributions by Gan Fuxi set the stage, and together comprise almost a quarter of the book. In Chapter 1, Gan Fuxi gives an overview of the origin and development of ancient Chinese glass from 'faience' and frit beads (1100-800 BCE) and the earliest glasses (500-400 BCE) through the historic periods up to 1900. Chinese glass production relied mainly on two kinds of fluxing agents: lead and potash (salt-petre was probably used for potash), producing different glass compositions in certain periods. Gan Fuxi's timeline of Chinese glass distinguishes five different periods: (1) he suggests the few early finds of potassium alkali glass (500-400 BCE) originate from Central China; more detailed quantitative analysis would be welcome for future research in this regard; (2) the second or Han period (400 BCE-200 AD) reveals the characteristic Chinese lead-barium glass production generally thought to be located in the Yangzi River valleys, and a potash glass which prevailed in the southern and southwestern regions during this period; (3) post-Han period lead glasses (200-700 CE); (4) potash-lead glass (600-1200 CE); and (5) potash lime glass (1200-1900 CE).

In Chapter 2, Gan Fuxi presents an overview of the several routes subsumed under the term, the Silk Road; presenting analyses of glass finds from the Warring States period to the Yuan Dynasty, the discussion focusing on the early periods and early trade connections. Four different Silk Roads are discussed together with the glass objects found in their areas: Firstly, glass finds in the area of the 'Northern (Steppe) Route' show the wide distribution of glasses made in inner China and in the West; a late highlight are the Islamic glass vessels from an early 11th century tomb. Secondly, along the 'Northwestern (Oasis) Silk Road' glass finds from Kiziltur, Xinjiang, dated 1100-800 BCE, are considered to be locally produced but with Western Asiatic glass technology. For the Qin and Han periods, definite imports of Mediterranean and Western Asiatic glass are documented, as well as the spread of Central Chinese lead-barium glass to the western part of Xinjiang. Later, Sasanian and Islamic glasses were imported along this route. Thirdly, the 'Southwestern (Buddhist) Silk Road'; here the Sichuan-Yunnan-Burma-India route is represented by finds of lead-barium glass, potash glass, and a few finds of western soda lime glass in Yunnan and Guizhou from the Warring States to the Six Dynasties periods. Finally, the section on the 'Southern (Sea) Silk Road' deals with glasses found in Guangxi and Guangdong. Hepu in Guangxi was the seat of the Hepu commandery in the Han period and a flourishing harbour and starting point for the maritime Silk Road. Most of the Han period glasses unearthed in Guangxi are potash glasses, many with characteristic Chinese shapes, and therefore considered to be locally made, whereas those from Guangdong are mostly lead-barium glass. Both types of glass were probably also exported overseas through the ports of Guangdong and Guangxi. From the Six Dynasties to the Tang period a number of imported glass vessels of Mediterranean and Western Asiatic origin attest to the activity of the ports of southern

China, from where such imported glasses might also have been transported north into central China.

A large proportion of the other papers in this volume are devoted to detailed studies on glass finds along the 'Northern' and 'Northwestern Silk Roads' and their chemical analyses. Chapters 3 and 4 by Robert Brill present finds from Afghanistan to Xinjiang with some Central Asian glass compositions of plant-ash soda lime or mixed-alkali glasses. Chapters 7 and 8 by Abdugani Abdurazakov focus on finds from Uzbekistan, which reveal a variety of Central Asian glass compositions from the ancient and mediaeval periods and later. Chapters 11, 13-18, by several Chinese scientists and archaeologists, present glass artefacts and their analyses found in northern provinces such as Xinjiang, Gansu, Shaanxi, Inner Mongolia etc., which allow interesting conclusions on early trade connections. Chapter 19 by An Jiayao discusses the earliest blown Chinese glass vessels found in Northern Wei contexts of the 5th century CE. Referring to a passage on the Western Lands in the Bei shi, she suggests that the technique of glass-blowing was introduced to northern China by immigrant Central Asian craftsmen from Bactria (the country of the Dayuezhi), who settled in the Datong area.

Several papers deal with glass finds along the 'Southern Silk Road'. Chapters 5 and 6 by Insook Lee set the stage for the Silk Road of the Sea with emphasis on the maritime bead trade.

The categorisation of ancient glass into different glass families or glass systems is based mainly on the intentional use of different fluxing agents in the primary process of making glass.

By the late first millenium BCE, Southeast Asia was part of a world trading system linking the civilisations of the Mediterranean Basin and Han period China. The maritime network is seen as extending to Korea and Japan, where a similar diversity of glass compositions compared to those found in China occur. Chapter 9 by Koezuka and Yamasaki deals with early potash glasses in Japan dated to a period from the 3rd century BCE to the 3rd century CE. In Chapter 10, Akiko Hokura et al. investigate the glass reliquary in the Toshodaiji in Nara, examined with a portable XRF spectrometer; the results suggest an Islamic plant ash glass. Chapter 20 by An Jiayao presents new finds of Islamic glassware found in 10th century contexts in Guangzhou, representing the extent of imports through the port of Guangzhou.

Chapters 21 (Li Qinghui et al.), 22 (Fu Xiufeng and Gan Fuxi), and 23 (Ma Bo et al.) with numerous analyses of glass artefacts found in southern and southwestern China make an important contribution to our knowledge of the extent and frequency of distribution of potash glass and its coexistence with lead-barium glass. Among Han period glasses from Hepu in Guangxi povince, potash glass by far predominates (Chapter 21), indicating – in conjunction with statistical analysis on trace elements (Chapter 22) – the making of potash glass in the Guangxi area. The findings on potash glasses are certainly among the most interesting results of research. Since the discovery of the potash glass composition among glasses from southern China in the mid 1980s in the analyses by Shi Meiguang and those by Robert Brill, much more data is now available. However, the question of where the making of the potash glass originated is still unresolved, and is touched upon also by some of the other papers (see below, Brill ch.3,4, Lee 5). It is also found in Japan, Korea, Thailand, Vietnam, Indonesia, and southern India. Different compositional groups can be distinguished within the potash glass family (Lankton and Dussubieux 2006), here future research might further refine regional differentiation. Potash glass was very likely made in different places, one of them was probably in southern China or northern Vietnam. The detection of thallium as a trace element in two potash glass ear spools of characteristic Chinese shape might indicate that some raw material – or possibly just the cobalt colourant – came from southwest China, where thallium deposits occur in Guizhou (Brill ch.5: 156-158). Whereas the Chinese-made glass objects are usually ornaments, a group of glass vessels made of potash glass, found in Han period tombs in Guangxi, is of particular interest. The potash glasses and their possible connections with the routes of the maritime Silk Road will certainly remain an interesting field for further studies.

Southeast Asia was part of a world trading system linking the civilisations of the Mediterranean Basin and Han period China.

In the last chapter 24, Gan Fuxi et al. present the earliest dated find of glass imported from the West to Central China – eleven eye beads made of a soda-lime glass from a tomb in Xujialing, Henan, dated about

500 BCE. A few more such finds of Western glass are known from the tomb of Marquis Yi, Hubei, and two more tombs from Henan.

Rooted firmly in the field of archaeometry, the volume presents altogether more than 40 tables with chemical compositions of glass found in China, derived from different analysing methods. The emphasis is clearly on the early periods, from the origins of early Chinese glass in the mid-first millenium BCE and its first flourishing production in the Han period. The English edition will certainly be appreciated, and not only by specialists, as it facilitates access to recent results in a fascinating field of research. For the more generally interested reader, a more carefully proofread effort, in particular with regard to the rendering of geographical names, would have been helpful; these, however, are minor flaws. The volume will serve as a new compendium for studies on early Asian glasses, in the same way that, for almost two decades, the 1991 English publication of the Proceedings of the 1984 International Symposium on Glass, Beijing did.

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Heritage Conservation in Dynamic Asia - a professional development course

Amphawa Floating Market in Samut Songkram, Thailand.
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Course Description

Heritage sites are memorialised and constructed as places of remembrance. They also serve as tools in strengthening national identities and are important sources of income. Heritage sites are localities, buildings, monuments, landscapes or even cities. Tourism has become an important use of heritage sites, although remembrance and their roles in identity formation were essentially the driving forces for their existence. Available reports point to the rise of tourism in heritage sites in Asia coinciding with the rise of tourism as, arguably, the world's largest industry. In one sense, this has been a welcome development for it brings in income and economic development for the locality. On another, however, it also comes with a worrying flipside: these sites lack appropriate management strategies. The agencies involved are underfunded and lack the necessary knowledge and skills to address pressing and evolving challenges. Some sites have been 'loved-to-death' as hordes of tourists visit these sites. Many heritage sites are vulnerable to overuse such that they can only cope with a modest number of visitors but tourism business is profit-oriented and rely on an influx of visitors for the business to be profitable. Thus, tension between tourism and conservation of heritage sites is an ongoing reality in Asia and managers of heritage sites should be able to proactively address these concerns.

This course aims to provide participants with the skills and knowledge to deepen their understanding of the concepts and practices of heritage conservation in light of new developments in Asia using examples and case studies of various heritage sites in Thailand, the location of the course.

Course Objectives

At the end of the course, participants should be able to:

- Understand the critical challenges to the management of heritage sites in Asia;
- Learn new skills and insights on the state of the art of heritage management and conservation; and,
- Apply lessons learned on the best practices of heritage management and conservation.

Who is the course for?

- mid-level career officers involved in heritage conservation and management in both private and government sectors;
- urban planners and natural resource managers with interest in natural and cultural heritage management;
- heritage and eco-tourism managers who are interested in gaining knowledge and skills in heritage conservation and management; and
- development practitioners interested in heritage planning, conservation, management and tourism.

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- A general introduction of heritage conservation and management with emphasis on, but not limited to, Asia;
- Methods and techniques in heritage conservation and management whether as cultural, natural or mixed sites;
- The role of heritage sites in economic development and how tensions between conservation and tourism development be addressed;
- Heritage legislations and financing mechanisms – learning from European examples and applied to Asian context;
- Integrating heritage conservation and management with urban development;
- Planning methods – from site identification to fact-finding and data inventory;
- Site management approaches.

Thailand has a number of sites with Heritage Awards including Samchuk Community and Old Market District (Award of Merit 2009), Wat Pongsanuk (Award of Merit 2008); Tamnak Yai, Devavesm Palace (Honourable Mention 2005); Phra Racha Wang Derm (Award of Merit 2004); and Wat Sratong Temple (Award of Merit 2002). Field trips and case studies to selected heritage typologies and sites in Thailand will be made to look at the lessons learned in dealing with various conservation issues:

- Building – The Crown Property Bureau Building in Chachoengsao Province, Thailand – This site received a Honourable Mention in the 2008 Heritage Awards and has been an important part of the revitalisation of the urban district of Chachoengsao and the Bangpakong waterfront.
- Cultural Landscape - Bangkok's Ratanakosin Island – Founded in 1782, this is the historic center of Bangkok. This site hosts a number of royal temples, palaces, classic and historical government and residential buildings and monuments with utmost importance to the Thai people. The Ratanakosin area offers interesting lessons of persistent long-term protection policies integrated with urban development planning as it was declared a special protected area on the occasion of the 200th anniversary of Bangkok in 1982.
- Archaeological site - Historic City of Ayutthaya and Associated Historic Towns – This is an extensive collection of magnificent ruins of the old capital of Siam (now Thailand), located north of Bangkok, which was inscribed as a World Heritage Site in 1991. In 2007, it was reported that it is under threat of being deleted from the list unless proper measures are in place to prevent encroachment and over development of the historic sites.
- Historic town - Amphawa Canal Community in Samut Songkhram Province- This site is located southwest of Bangkok amidst fruit orchards, coconut groves and extensive canal networks. The site is a local heritage tourism project with considerable community involvement promoting the life and culture of the place. This site has received a honourable mention in the 2008 UNESCO Heritage Awards.

For more information on this course, contact:

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Fax: (66-2) 524-6332
Web: http://extension.ait.asia

Who teaches in the course?

The course will be taught and led by experts and professionals in various aspects of heritage planning, conservation, and management including:

- **Prof H. Detlef Kammeier** – an Independent Researcher and Consultant with a broad experience in urban planning and heritage conservation in Asia and other regions of the world.
- **Dr. Richard Engelhardt** – UNESCO Charge de Mission and Senior Advisor to the Assistant Director-General for Culture. Holds the UNESCO Chair of Heritage Management at the National College of Art in Lahore, Pakistan and is a Visiting Research Professor in the Department of Architecture at the University of Hong Kong.
- **Dr. Yongtanit Pimonsathean** – Associate Professor of Architecture and Planning, Thammasart University. One of the pioneers of applied urban conservation in Thailand. Awarded in 2009 the Princess Sirindhorn Award for Outstanding Architect.
- **Dr. Pinraj Khanjanusthiti** – Faculty of Architecture, Chulalongkorn University. Was Involved in a number of heritage projects such as the conservation and management of the Santa Cruz Community in Bangkok and the masterplan for Sam Prang Historic District, Bangkok.
- **Ms Montira Horayangura Unakul** – Programme Officer, UNESCO Culture Office, Bangkok – Coordinates UNESCO-Bangkok's activities related to World Heritage; built heritage, including the UNESCO Heritage Awards for Culture Heritage Conservation; sustainable tourism development; heritage capacity building; and museums.

Tuition Fee: USD 2,500

This tuition fee covers tuition, course materials, airport transfers, field trips and minor medical care only. International air travel, daily meals, and accommodation are not covered.

Duration: Two weeks,
07 to 19 February 2011

Venue: AIT Conference Centre,
Bangkok, Thailand

AIT Extension
Professional Education For Capacity Building

SEARCA INVITES APPLICATIONS FOR GRADUATE SCHOLARSHIP IN AGRICULTURE FOR SCHOOL YEAR 2012-2013

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) invites applications for its graduate scholarship (MS and PhD) in agriculture and related fields (including biological sciences, social sciences, economics and statistics, forestry and fisheries, environmental sciences, agro-industrial technology and engineering, biochemistry, and development management) for school year 2012-2013. The scholarship is open to nationals of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste, and Vietnam who are regular employees of academic or research institutions or government agencies and not older than 35 years old.

Applications may be submitted directly to the Ministry of Education/Higher Education, or to the Ministry where the applicant is employed for preliminary screening. The Ministry where the applicant is employed may conduct preliminary screening of applicants and submit their nominations and the application documents to the Ministry of Education/Higher Education, which will then include the nominees of other Ministries in the final list of candidates accompanied by the complete set of requirements to SEARCA not later than 30 July 2011. Applicants should inquire with their respective Ministries regarding the Ministries' deadline for receiving SEARCA applications.

SEARCA scholars may study at any of the following members of the University Consortium coordinated by SEARCA: Universiti Putra Malaysia, Malaysia; Kasetsart University, Thailand; Institut Pertanian Bogor and Universitas Gadjah Mada, Indonesia; and University of the Philippines Los Baños, Philippines. Other reputable universities outside the University Consortium but within the Southeast Asian region may also serve as study posts of scholars under special arrangements and project agreements. Applicants may apply online via the SEARCA website, but original application documents must still be sent to their Ministry for official endorsement and submission to SEARCA. Applicants are required to submit to SEARCA applications for admission to the Graduate Schools of at least three universities in the list.

The application requirements and forms may study may be downloaded from the SEARCA website at http://www.searca.org.

The topic of the research that the applicants plan to conduct for their thesis must be in line with either of the priority thrusts of SEARCA, namely: natural resource management and agricultural competitiveness.

Interested parties may contact the Graduate Scholarship Department of SEARCA via email at gsd@agri.searca.org or ecc@agri.searca.org.

3D sites and monuments

Digital three-dimensional recreation of ancient sites and monuments is being increasingly undertaken in Southeast Asia.

A 3D film of a relic site in Vietnam's historic Hue city has been produced by the Republic of Korea Advanced Institute of Science and Technology, *VOV News* says.

Made on the Ho Quyen royal arena in the former imperial city, the 10-minute film is part of a heritage preservation project collaboration between Vietnam and Korea.

It re-enacts scenes staged for the king and the royal court that feature fights between tigers and elephants as rituals during the Nguyen Dynasty.

In Thailand, students of the Kasetsart University have produced a digital representation of a temple, Wat Chaiwattanaram, in the world heritage city of Ayutthaya.

The 3D temple virtual-world allows internet visitors to gain insights into Thailand's past, its heritage, arts, and culture.

The 3D Virtual World Heritage Wat Chaiwattanaram promotes an innovative Internet tourism, and opens the possibilities for incorporating three-dimensional computer models in preservation efforts and tourism.

New archaeological findings on Bayon

The *Phnom Penh Post* says that a team of Cambodian and Japanese archaeologists has presented recent discoveries from the Bayon temple excavation at Angkor Thom.

Approximately a thousand objects under the temple have been excavated, and include pieces of gold, religious artefacts, and tools.

Ceramics believed to have come from Vietnam, Thailand and Japan have also been discovered.

In a separate report, the *Phnom Penh Post* says that an unconventional conservation approach has been taken in the restoration of the Bakong in Angkor.

Usually, restoration efforts are centred on ancient Khmer edifices at the Angkor temples, but at Bakong, a conservation team has been restoring Buddhist paintings in 20th century monuments in the complex.

The Restaurateurs Sans Frontieres have been working on the wall paintings which had been neglected and dismissed as kitsch.

Monasteries in Cambodia feature murals which often depict tales from the life and previous lives of Buddha in brightly-painted scenes.

Foot bone oldest remains found in the Philippines

Archaeologists believe an excavated foot bone could determine that humans first inhabited the Philippines 67,000 years ago, *AFP* reports.

The fossil is found to be older than the 47,000-year-old Tabon Man previously considered the first human to have settled in the Southeast Asian country.

An archaeological team from the University of the Philippines and the National Museum unearthed the third metatarsal bone in 2007 in the Callao caves near Penablanca, north of Manila, says the report.

Recent finds in Vietnam

Vietnam News reports that archaeologists in Vietnam are establishing new understanding of the Metal Age, based on ancient copper furnaces dug up at an archaeological site in Dong Anh recently.

A majority of the furnaces, which were designed similarly, is believed to approximately 4,000 years old.

The discoveries included copper objects, pottery shards, pans and tripods, and cinders, which may belong to a traditional kitchen.

Another archaeological news item by the news agency says that a terracotta jar has been unearthed at the Nhan Co site in Dac Nong.

Archaeologists found 109 pieces of the jar, and other artefacts such as variety of rocks, tools, hoes, and unidentified objects.

They said that the finds prove that humans inhabited the area during the Middle stone and New Stone Age.

Vietnam News also reports that along the banks of Ky Lo River in Phu Yen, hundreds of urns or jar tombs have been discovered.

The terracotta urns, which are oval and of various sizes, are among objects found at the archaeological site that included debris from plates, bowls, and white bricks.

Archaeology unit set up in Singapore

An archaeology unit, headed by Dr. John Miksic and Mr. Lim Chen Sian, has been established in Singapore, and is the country's first formal archaeological unit, a *Straits Times* report says.

As part of the Nalanda-Sriwijaya Centre at the Institute of Southeast Asian Studies (Iseas), the unit will concentrate on the early past of Singapore and the region, and show the links between peoples and cultures for centuries.

Associate Professor John Miksic has been working in the region for four decades, and was responsible for the excavations at Fort Canning that yielded evidences detailing life in the 14th Century.

Art & Archaeology – International
Ean Lee

Mr. Lim is thought to be the only full-time local archaeologist, responsible for excavating a site between the old Supreme Court and City Hall.

Iseas director Mr. K. Kesavapung made the decision on setting up the unit as he realized that the only Asean member without a proper archaeology centre was Singapore.

The unit's major task is to process the thousands of artefacts discovered during several years that had not been analysed.

Prof. Miksic says that another priority is to develop a website and an electronic journal on Southeast Asian archaeology to share the unit's work.

Laos a focus of prehistoric human settlement

The *Vientiane Times* reports that Dr. Joyce White from the University of Pennsylvannia Museum, believes that Luang Prabang "could represent the heartland of human settlement in the Mekong region".

Dr. White and Mr. Bounheuang Bouasisengpaseuth, Deputy Director of the Lao National Museum, have been surveying and mapping both Luang Prabang and Vientiane for nearly a decade.

As leaders of the Middle Mekong Archaeological Project (MMAP), they recently presented their latest findings indicating that the Mekong region was an ancient melting pot of people, cultures, and technologies for over 5,000 years.

About 60 sites which yielded thousands of bones, stone tools and pottery shards, and other evidence of human habitation are located in the northern province of Luang Prabang.

Among the most outstanding finds is a secondary burial dated 2,000 years old, uncovered in Tham An Cave.

Bones and skulls of three people were discovered in a mortuary pot that had been reburied after the initial internment, representing an example of a burial ritual within the region, and common to Thailand and Vietnam.

The MMAP is an archaeological collaboration between Lao National Museum and an international group of experts. Professionals from Europe and the US along with geologists from the local Department of Mines have been training Laotians, and sharing skills and techniques not applied locally before.

Research rewriting Myanmar's history

Archaeologists and experts have been investigating the Pontaung primate fossils found in rock layers in the Pontaung region of Myanmar.

China's *Xinhua* news agency reports that the authorities in Myanmar claimed the origin of

Myanmar people can be established by the archaeological research supported by the findings and examination of evidences such as those at Pontaung.

The discoveries of primates from the Stone Age, Bronze Age, and Iron Age, and research in Meiktila and Yamethin districts of Mandalay are contributing to a refining of Myanmar history, the report says.

It also says that in 2009, evidences indication Bronze and Iron ages were excavated in Thazi, Mandalay that included 44 bodies, iron objects, stone beads, and earth-baked as well as earthern artefacts.

Six hundred years of history in fishermen's nets

An exhibition at the 2010 Hue Festival in Vietnam has been displaying more than 300 objects dating back six centuries, *VOV News* says.

Held at the Revolutionary History Museum in Thua Thien-Hue, the exhibition contains artefacts chosen from over a million items that fishermen found from wreckages of merchant ships plying between China, Thailand, and Vietnam.

The ancient artefacts, from ships that sunk during the 15th - 18th centuries, were made of a diversity of materials, including metals, stone, wood, and ceramics.

Thailand's northeast yields dinosaur bones

A Thai-French team of diggers has discovered 15 bone shards belonging to a 150-million-year-old herbivore in Kalasin, Thailand.

The Nation, a Bangkok daily, reports that the find includes scapula, coracid, massive pelvic, as well as a 150 cm hip bone which belonged to a new species of Sauropod dinosaurs.

Excavating in a layer of rock that is 150 million years old, and at about 25 m, the discoveries are expected to become the biggest and oldest in the country.

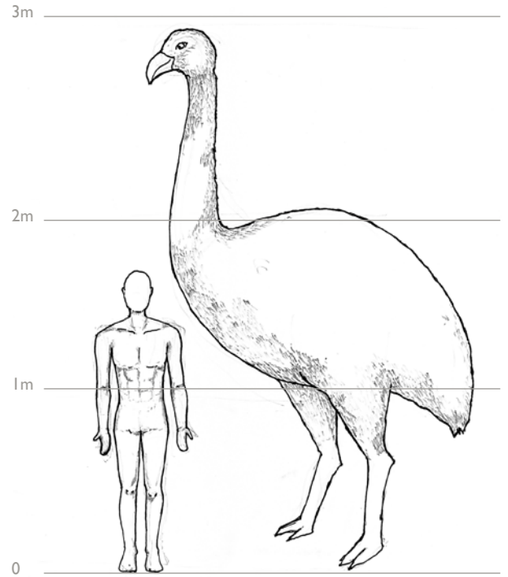
As part of a 30-year investigation into the evolution of Mesozoic era bio-diversity in Thailand, funded by the Thailand Research Fund and France's Scientific Research Centre, the fossils will undergo conservation and documentation at the Sirindhorn Museum.

Over 2,000 bones representing five dinosaur species have been found in the Northeast of Thailand during the past 25 years.

Eggshells yield DNA of ancient birds

An international team of researchers discovered that a rich source of preserved DNA could be obtained from eggshells of extinct bird species.

The researchers also isolated DNA molecules in the eggs of emu, ducks, and the extinct moa.



Aepyornis stood at 3 m tall
Sketch by Wanichaya

A researcher on the team, Charlotte Oskam of Murdoch University, said that scientists had been applying a DNA isolation method designed for bone rather that fossil eggshell, and had been unsuccessful.

Through the new approach, the DNA of a diversity of species, including the elephant bird Aepyornis, were extracted.

The Aepyornis was an ostrich-looking extinct bird which stood 3 m tall, and at half a tonne, was the heaviest bird ever existed.

Most of the ancient birds disappeared a thousand years ago.

Collapse at the Domus Aurea of Nero

Part of the ceiling over the Domus Aurea (House of Gold) complex has collapsed, raising worries about the stability of the palace of the Roman emperor Nero.

Authorities believe that water damage caused the collapse of the tunnel section of Hadrian's Baths.

Located between the Colosseum and the Roman Forum, the Domus Aurea had been closed for restoration, and was a major tourist attraction. It reopened in 1999 after 18 years of restoration, when structural problems and water infiltration were serious concerns. In 2001, part of a ceiling fell, and it was closed to the public again.

The large place is known as the House of Gold because of the gold leafs that cover it.

Built in 68 AD, the vaulted ceilings of the complex were once encrusted with pears, adorned with ivory, and frescoes filled its maze of passageways.

Fossil link humans and apes/ monkeys

The skull of a 29 million-year-old creature that might have been a common ancestor of pre-historic monkeys and apes, including humans, has been unearthed in Saudi Arabia.

Researchers from the University of Michigan say that the fossilized remains belong to a primate, Saadanius hijazensis, and share features common to prehistoric apes and monkeys, including humans today.

The scientists hope to learn something about that time period and the animal's living conditions so as to discover what causes the evolution of apes and humans.

Ultimately, the research may show that Saadanius might even have been the common ancestor linking humans to ancient monkeys.

Radar finds ancient Egyptian city

Radar imaging located an ancient Egyptian city in the Nile Delta.

BBC reports that a team of Austrian archaeologists found the underground outlines of the city, believed to be Avaris.

Avaris was the summer capital of the Hyksos people who were foreign occupiers from Asia, and ruled Egypt for a century about 3,500 years ago.

The radar images show the underground outlines of the city, streets and houses below the rural and urban landscapes of the densely populated Delta area.

Determining the extension of the underground ancient city is the major objective of the team of archaeologists.

Images of Jesus' apostles found

Art restorers in Rome have uncovered paintings of some of Jesus Christ's apostles believed to be the oldest ever found.

New laser technology, when applied on 4 - 5th Century paintings in a catacomb, reveal faces of apostles Andrew, John, Peter, and Paul.

BBC reports that the head of archaeology for Rome's Vatican-owned catacombs, Fabrizio Bisconti, said the four apostles faces are the first images found of the four apostles.

Restorers were working in a tomb of a Roman noblewoman in the Santa Tecla catacomb in a Vatican-funded project, and had known about the frescoes.

Using new laser technology that burn off calcium carbonate deposits caused by extreme humidity and low oxygen level, the images came to light, and astounded the project team.

Monster whale fossil found

Fossilized remains of a huge 12 million-year-old sea creature scientists dubbed 'Leviathon' have been discovered.

Described as an ancient monster whale, Leviathan is thought to have been over 17 m long.

Researchers said that the ancient creature, similar in size and appearance to the modern sperm whale, was an aggressive predator of large marine life forms such as seals, dolphins, and other whales.

A 3 m-long fossilized skull was unearthed in southern Peru, which effectively ended mere speculation that such an awesome creative might have had existed.

The researchers reveal that the teeth of Leviathan were more than twice the size of those in modern sperm whales.

Picasso's Jacqueline auctioned at Christie's

A Picasso masterpiece, 'Tete de Femme' (Jacqueline), which had not been seen in public for 43 years, has been sold for £ 8.1 m.

Sketch by Ariya Kongwong

At Christie's Impressionist and Modern Art Evening Sale in London, the painting had been expected to be auctioned for £ 3 m - £ 4 m.

The 1963 portrait of Jacqueline, Picasso's second wife, was created at a time when she was becoming Picasso's most frequent and important muse and model.

It has been said that one of Picasso's reasons for depicting Jacqueline with a long neck was a humorous exaggeration of her short neck. 'Tete de feme' is also reminiscent of Amedeo Modigliani's paintings such as 'Jeune fille brune, assise'.

Hoard of Roman coins found buried

Discovery of over 52,000 3rd Century Roman coins has been made by a metal detector hobbyist in England, *BBC* Says.

The coins were stored in a huge jar buried in a field in Somerset.

Dave Crisp, who found the hoard with his metal detector, reported the discovery to the authorities.

Archaeologists from Somerset County Council excavated the site, and unearthed the clay jar, and estimated the weight of the coins at 160 kg.

It is expected that the coroner will declare the find as treasure, which would allow the coins to be bought at market value by the museum of Somerset, with Mr. Crisp and the site owner sharing the reward.

Lost ship for over 150 years found

Archaeologists in Canada have discovered a ship that had been abandoned for more than 150 years, the *China Post* reports.

March-Andre Bernier, head of underwater archaeology, said that in 1853 the HMS Investigator had been doomed in the ice and was found in the shallow water of Marcy Bay, Banks Island in Canada's Western Arctic.

The Investigator was one of several search ships commissioned to find the failed expedition of Sir John Franklin in 1845.

Ice has blocked the passage of the lost ship which was steered into the bay on the northern coast of the island.

The British government has been informed of the discovery of its naval shipwrecks that include the bodies of three sailors.

Award for salvaging Titanic artefacts

An American company has been awarded US$110m for retrieving and conserving artefacts from the wreck of the RMS Titanic.

A federal judge of a US court praised RMS Titanic Inc. for its extensive efforts, and ruled that the company, which displays the objects in museums all over the world, is entitled to their full market value.

The court will later decide on granting the RMS Titanic Inc. ownership of the artefacts or right to sell and receive the proceeds.

The company is a subsidiary of Premier Exhibitions Inc., and has conducted a total of 7 expeditions four km below the north Atlantic, retrieving over 5,500 items from the wreck site.

For the salvage operations, twenty specialised instruments were invented by the company in its dedicated effort to preserve items (from the Titanic which sank in 1912) that might have been lost and irretrievable.

Van Gogh painting stolen

Poor security at a Cairo museum allowed a Van Gogh painting to be stolen.

BBC reports that Abdel Meguid Mahmud, Egypt's top prosecutor, said that the alarms at the Mahmoud Khalil Museum did not work, and only 7 of 43 security cameras were functioning for a period of time before the theft.

The painting, 'Poppy Flowers' also known as 'Vase and Flowers, is worth US$50m, and was cut from its frame at the museum during the day.

Depicting yellow and red flowers, the work is believed to have been painted by Vincent Van Gogh in 1887.

It was the target of a theft from the same museum in 1978, only to be recovered a decade later in Kuwait.

Oldest arrow heads found

The earliest direct evidence of human-made arrows have been revealed by researchers in South Africa.

"Stone points" said to be 64,000 years old were unearthed, and thought to be arrow heads.

Excavated from layers of ancient sediment deposited up to 100,000 years ago, the arrow heads were dug up by an archaeological team led by Professor Lyn Wadley, University of the Witwatersrand.

Further examination showed blood and bone remnants on the ancient weapons.

They also found traces of glue that scientists believed to be plant-based resin used to faster the stone weapons to a wooden shaft.

The study may determine that the development of "bow and arrow technology" could be 20,000 years earlier than thought.