## ACCU Nara International Correspondent The Fifth Regular Report

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## ACCU Nara International Correspondents

The ACCU correspondents periodically send reports on cultural heritage protection activities in which they recently involved. This is a collection of the fifth reports submitted by fourteen international correspondents in the Asia-Pacific region.

## The Fifth Regular Report

## Contents

Bangladesh Mst. Naheed Sultana The Use of Ornamental Bricks in Ancient Buddhist Temples in Bihar Dhap of Bangladesh
Cambodia Srun Tech News from Angkor Archaeological Park : Research Excavation at the Iron Smelting Furnace
India 7   Vasant Kumar Swarnkar 7   Excavation of a Historic Shipwreck 7
Indonesia — 10 Mohammad Natsir Ridwan Muslim Conservation of Trowulan Site: The Former Capital City of Majapahit Kingdom
Malaysia A Ghafar Bin Ahmad Restoration of the Ihsaniah Iskandariah Mosque: The Old Mosque of Kampung Kuala Dal, Rerak, Malaysia
Maldives 16 Aishath Moosa Fikree Introduction of Cultural Tourism in the Maldives: Alif Dhaal Hanyaameedhoo
Mongolia Munkhjargal Nargui Archaeological Site: Kherlen Bars Tower
New Zealand 19 Matthew Schmidt

Preservation of the Bendigo Bakery at the Bendigo Goldfield, Central Otago, New Zealand: Stage 2 - Stabilisation and Archaeological Investigation -

## Papua New Guinea \_\_\_\_\_\_24

Naomi Faik Simet The Preservation and Maintenance of the Yangit Female Initiation Ceremony in Papua New Guinea

26

28

32

- 34

36

## Singapore

Faith Teh Eng Eng Engaging the Community: Marking of Heritage and Community Trails in Singapore

## Sri Lanka -

Sujeeva Kaushalyani Peiris Deraniyagala Conservation of Old Dutch Hospital Building, Galle Fort, Sri Lanka

## Thailand

Wirayar Chamnanpol Thailand's Cultural Heritage Protection Using GIS: Part II - Prediction of the Disaster Impact on Ancient Monument by GIS -

## Viet Nam —

Nguyen Khanh Trung Kien Binh Lam Tower: the Restoration and Conservation Issues

## Uzbekistan -

Akmaljon Ulmasov News from Uzbekistan on Cultural Heritage Preservation

# The Fifth Regular Report

## Bangladesh



## The Use of Ornamental Bricks in Ancient Buddhist Temples in Bihar Dhap of Bangladesh

Mst. Naheed Sultana, Custodian

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Ornamentation is one of the ancient devices of the growth of human civilization and culture. People in the Paleolithic Age made blunt weapons well-shaped and polished and thus they created a new tradition in the advancement of civilization. People in the Neolithic Age went a step ahead by producing and using fire in burning bricks and pottery. From the ancient period, extensive ornamental decoration in making wares and votive articles has been used for religious purposes. It is observed that the 'Rajas' (kings) and 'Maharajas'(Emperors) during their religion-based reign made rich and pompous administrative centres, forts, royal palaces, buildings, temples, mosques, under their personal supervision and patronage and thereby earned honour, name and fame. In these architectural frame works they made extensive, pompous decoration and beautification to gain public support from the subjects in one hand and to highlight religious fervour in the other. During the reign of Asoka the Great (272-232 B.C.), in the Maurya Dynasty when Buddhism became the state religion, he introduced ancient arts following those ancient types of works, and many artistic architectures and sculptures subsequently came into use. Evidences of those works have been found in the accounts of Huen Tsang, the world famous Chinese Buddhist pilgrim.

### Location and description of Bihar Dhap archaeological site:

The Buddhist archaeological site of Bihar Dhap is a village of Shibgonj Upozila in the northern district of Bogra in Bangladesh. Huen Tsang reported while traveling in Bengal that he visited a vast 'Sangharam'(Monastery) called Po-Shi-Po and met 700 Buddhist monks who took part in religious activities. Subsequently, in the year of 1879-1880, Sir Alexander Cunningham during his archaeological survey of Bengal, visited the place and identified the Bihar to be exactly the ancient Po-Shi-Po.

Two Buddhist monasteries (Sangharam) were revealed by conducting excavations at the west side of the archaeological site of Bihar Dhap. Besides, by conducting another excavation in the southern areas, a Buddhist temple measuring 29.50 m×29.00 m and the ruins of another Buddhist temple measuring 12.00 m × 9.70 m were unveiled.

The comparatively specious temple is assumed to be built in the 5th century A.D. and the small one in the 11th or 12th century. Only 2.28 m high walls have been found intact. The ornamented bricks were laid so artistically and perfectly in two layers of the wall that attract notice of all. Only1.05 meter-high wall from the surface, with ornamented bricks in one line were still in situ. Just 50 cm above this wall, the setting of large size terracotta plaques have wonderfully enriched the beautification along with the style of construction of the temple. Since the temple was devastated, only four terracotta plaques in the second layer have been found in situ.

### Ornamented bricks of the first layer

In the Vedibandh or first layer, the appropriate placement of 30



The Buddhist temple of Bihar Dhap archaeological site (11th -12th century)

ornamented bricks speaks of the acumen of the high order. Each of the ornamented bricks measures 25 cm×12 cm and they are placed at an equal distance of 25 cm. One of special characteristics of ornamented bricks is that the ornamentation pattern of one brick is different from one another. Each ornamented brick bear the emblem of lotus, petals of flowers, arch designs, geometrical designs, trident, wave and rope etc.

In respect of design and characteristics, the ornamented bricks are classified into seven categories:

(1) Arch-based ornamentation: The main characteristics were that each brick bore two arches. Moreover, there were ornamented borders bearing emblems of flower, petals of different type, four petal flowers, triangle ornamentation, rhombus, quadrilateral, pillar, chain motif in between and the side of ornamented bricks.

(2) Flower based ornamentation: In the second phase of ornamentation, the works were beautified by giving prominence to sunflower or lotus. An oval shaped border was made at the centre and a large number of petals were set around it and four half bloomed flowers covered the whole brick from the four corners of the flower.

(3) Notch-Arch based ornamentation: The ornamented bricks used in this section were notched and arched. Centering these arches, tall leaves, rhombus and wavy designs were beautifully engraved around the bricks. (4) Geometrical design based ornamentation: Ornamented bricks were divided into three triangles and half sunflower designs were set in between the triangles. The borders were ornamented by petals and wavy designs.

(5) Panel based ornamentation: Bricks of this portion was divided into three panels, and those panels were again divided into some triangular portions. Half sunflower designs were made within the triangles. Besides, the panels at the middle were filled with chain motif and flower petals.

(6) Half-floral design based ornamentation: The bricks were divided into three panels. At the middle of the panels, full-flowered china roses were set. Again the panels were divided into triangles and those were filled with half bloomed sun flowers and flower petals. (7) Own self's design: In the seventh part of the work, it was observed that the five ornamented bricks were quite different from others. Here, one brick contained geometrical ornamentation of floral designs in it and another brick with four rows of dog teeth covering the whole portion were found. The third was found to have been ornamented geometrically with four-petal flower design. In the fourth, we observed a four centered arch divided into two parts and set at the middle of the panel. In the fifth, we found two tridents were set horizontally with spiral design ornamentation.



Arch-based Ornamentation



Floral based ornamentation

In the field of construction of temples and other religious edifice in Bangladesh, the device of beautifying by terracotta plaques and ornamented bricks undoubtedly added new and own dimensions.



Geometrical design based ornamentation



Half-floral design based ornamentation



Own self's design

## Cambodia



## News from Angkor Archaeological Park: Research Excavation at the Iron Smelting Furnace

Srun Teck, Archaeologist, Archaeological Preventive Unit, Department of Conservation of Monuments in the Angkor Park and Preventive Archaeology, APSARA Authority

### 1. Localization of Iron Mine Site and Iron Production

The main iron mine sites in Cambodia are located in the north of the country, called *Phnom Dek*, which literally means "Hill of Iron", and situated about 228 kilometers north of Phnom Penh City in Kampong Thom Province (the heart of Cambodia).

The famous iron production centers are as follows:

- *Bakan*, called Preah Khan Kompong Svay, a city of Jayavarman VII. *Chanrot* located close to the well-known iron mine, in Kampong Thom Province.
- Phnom Dek, in Preah Vihear Province.
- *Prey Sanlong*, located about 20km eastern of Royal Road Angkor-Phimai, in Udor Meanchey Province.

There are many iron smelting furnaces at each iron production center.

#### 2. History of Iron Smelting

Most of the iron smelting furnaces sites are near the ethnic *Kuy* community's settlements. *Kuy* population settled in Cambodia and Thailand. They were masters of iron and fires; and also masters of elephant hunting. Observing the sculptures of Angkor temple walls, we can find elephants, scene of combats and war tools. This does

not mean that all those sculptures were from Kuy people, but at least *Kuy* has paid their contributions to royal services. Numerous Khmer words were borrowed from *Kuy* language especially in the fields related to the rituals, tradition and customs. From cultural point of view, the *Kuy* has been existing as an ethnic minority very close to the Khmer. They knew and well performed Khmer traditions and beliefs in their daily life. The word "Sanlong", which means iron smelting site in a *Kuy* dialect, is still used in any *KuyDek communities* [*Final report of LARP team*, 2007].

During the intensive cultural survey in their settlements, the person whom we interviewed said that in the ancient time Khmer and Kuy people did the smelting but nobody remembered how to smelt any more. He also said that he knew how to produce different kinds of tools from metal/iron. He was currently still producing a kind of swords and knives (such cutting tools are used in daily life), which was a very important thing to learn [*Final report of LARP team, 2007*].

The Iron tools produced by the *Kuy*, living on the north of Cambodia in the 19th century, are similar to that of sculptured on the walls of Angkor Wat temple (in the 12th century) *[Jack-Hergoaulc'b, 1979*].



Mapping of Kuy settlements (LARP document)



Excavation activities



A map of the Kvav iron smelting

It was supposed that the *Kuy* people had supported the Khmer empire by providing the iron weapons. Since 1880, the Kingdom of Khmer and Thailand have imported iron from China *[Udaya, N.7,* 2006].

Since around 1930, the income from iron production was not enough for supporting their living so they have to find other jobs. Moreover, many iron fragments from scrapped cars or motors became easily available thus *Kuy* people decided to stop the iron refining. In 1970, the iron smelting furnaces were abandoned and covered by vegetation *[Udaya, N.7, 2006]*.

#### 3. Research Excavation at Iron Smelting Furnace

The iron smelting furnaces are located in Kvav Village, Kvav Commune, Chikraeng District, Siem Reap Province and on the southern of Royal Road from Angkor to Bakan (Preah Khan Kompong Svay), *see the map of the kvav iron smelting*. Up to now, this site has not been discovered by any other scholar, but APSARA Authority has known it by chance. Local residents destroyed these sites when they constructed their houses and cleared the land for farming. In that region, there are five iron mounds, called by local people "*Hill of Iron*" but four of them were already destroyed.

This was the first time that the research excavation was conducted on the iron smelting furnace in Cambodia. Those in charge of excavation were Cambodian archaeologists from the LARP team, Living Angkor Road Project (IM Sokrithy, Ea Darith, Heng Than, Khieu Chan, Srun Tech, Kim Samnang), APSARA Authority. The team was successful in research of the Royal Road from Angkor to Phimai (Korat Province, Thailand) and they also participated in excavation on iron smelting furnace in Ban Khao Din Tai, Ban Kruad, in Buriram Province, Thailand with Thai counterparts.

From the Angkor to the Cambodia border, the LARP team found ten mound sites of the iron smelting along the Royal Road from Angkor to Phimai, three sites in Siem Reap Province, five sites in Udor Meanchey Province and two more on the north of the Khmer-Thai border.

The excavation at iron smelting furnace in Kvav Village was conducted in August 2009 and finished in September 2009. The team decided to excavate on iron mound located on the west because the iron mound was destroyed some part and on the verge of complete destruction in the near future. For the rest areas we opened four trenches covered on an area of 56 sq km, see the topographic map.

The aims of the excavation are to gain knowledge on the ancient iron smelting technology to compare with other sites, and to gather data that can further lead to a better understanding on the association and relationship of the "Ancient Royal Road".

As a result, the LARP team did not unearth iron smelting furnaces intact, but they found the remains of iron slag, iron ores, Charcoals and ash, iron smelting debris, many fragments of Tuyères (pipe of the smelting made from burned clay), and trace



The famous iron production centers in Cambodia (LARP document)



A topographic map of excavation trenches (LARP document)



Metal slag at Prey Sanlong



Tuyères, metal slag and debris of furnace wall (burned clay)

Cambodia

of three holes of wooden shelter column. Based on these results, the team concluded that there were two wooden shelters removed after they stop in production there. This site was probably not successful in iron smelting work because the team discovered lots of unrefined irons ores still remained.

The smelting furnace was demolished after they finished the smelting iron work. The furnace wall was made by clay with bamboo stick. The team temporally identified that this site existed in the same period as the Angkor by comparing with the fragments of Khmer and Chinese potsherds excavated in the same trench [*Report of LARP team, 2009*].



Metal slag at Bakan (LARP photo)



A topographic map, one of five mounds at Kvav iron smelting (LARP document)



Excavation activities

## India

India



## Excavation of a Historic Shipwreck

Vasant Kumar Swarnkar, Deputy Superintending Archaeologist Archaeological Survey of India

Ships and boats have always played an important role in the history of mankind. These were the only means of survival and of contact with the other world especially for the people living in the isolated islands. Many of the ships crossed high seas and reached to their destinations but some of them got wrecked on their way and are still lying preserved on the ocean floor. One of such ancient shipwrecks, Princes Royal, was found on the outer slope of the reef of Bangaram Island. Excavation of Princes Royal, a historic ship-wreck in the Arabian Sea, was the first underwater archaeological excavation in the country taken up by the Archaeological Survey of India.

### Location

Bangaram Island (10° 56' North lat. and 72° 17' East long.) is situated in Union Territory of Lakshadweep, which is lying directly in the trade route between Africa, Arabia and Malabar Coast. These regions were the land mark for the ships sailing in Arabian Sea. The Bangaram Island is lying about 8 km north of Agatti and 459 km away from Cochin. This tiny Island of 47 hectares is enclosed by 10 km long and 6 km wide magnificent lagoon.

#### **Discovery and Previous Research**

On December 1990, three sport divers noticed some objects lying exposed on the outer slope of the coral reef. They managed to lift a number of objects which were taken by the Police. In April 1991, Dr Alok Tripathi from the Archaeological Survey of India carried out diving to the 40 m depth using a conventional compressed air diving method and systematically studied the wreck site. In April 1992, the diving team from Marine Archaeology Club, Bombay visited the site and carried out diving. In March 1995, divers of Southern Naval Command of Indian Navy also carried out diving on the site and INS Sujata fixed the position of the wreck. With the establishment of Underwater Archaeology Wing, the Director-General of Archaeological Survey of India, approved the excavation of this shipwreck in the field season of 2001-2002. In May 2002, the site was reinvestigated jointly with Indian Navy. INS Jamuna equipped with latest survey equipments was deputed to carry out underwater survey. The INS Nireekshak was deployed for underwater archaeological excavation. Besides this, country boats were hired for carrying out diving. One of the boats was installed with underwater camera and communication system.

#### Site

At the shipwreck site debris of the wreck was scattered over a large area ranging from 9 to 64 m in depth. Area from 9 to 12 m, had a gentle slope with some ups and downs. After 12 m in depth, there was sudden fall and then a steep slope down to 36 m. The slope of the middle terrace between 20-36 m was sandy and scattered with a variety of artifacts. After 36 m, there was a vertical fall to 51 m. The lower terrace from 51 to 64 m, was sloppy with thick cover of sand and heaps of artifacts close to a cliff. After 64 m, the depth falls to several thousand meters.

### Diving

Due to safety regulations, the diving was restricted to 54 m in depth. A wide range of diving equipment was used by the divers of the Archaeological Survey of India and Indian Navy during the excavation. The Superlite 17 – B helmets was used to lighten divers from carrying cylinder and to provide an opportunity to work for longer duration. Self contained underwater breathing apparatus (SCUBA) with twin cylinders was used in deeper diving, which helped in free movement of divers during identification of objects and documentation of the site. Self contained Divator sets were used with wireless underwater communication system. The director of the excavation project constantly monitored the activities of these divers on the sea and necessary instructions were given time to time. The excavation followed a thorough documentation of all the objects and activities on the site through photography, videography, drawings and detailed notes.

## Layout of Grids

The site was divided into two parts, i.e. southern and northern sectors. The entire site was divided into three metre square grids with the help of 8 mm lines running east to west and north to south. Each grid was given a specific number for conducting systematic excavation. In the northern sector, an area was selected on the lower edge of the middle terrace. A grid of perforated iron angle was prepared to mark the area of excavation.



The anchor of the shipwreck



Bangaram Island

## **Excavation/ Findings**

Excavation was conducted very systematically with excellent documentation. Mechanical as well as manual methods were employed for conducting excavation. Debris was removed layer by layer and every find was carefully documented by the archaeologist or under his direct supervision. Large numbers of bricks, pieces of brown glazed jars, pieces of wood, corroded and cemented parts of the ship, a copper fry-pan, potsherd of porcelain, potsherd of red ware with embossed design, etc. were recovered from the trenches. Two complete brown glazed pots, one green glazed potsherd, one bowl were also recovered. Iron objects like cannon, an anchor, copper objects like long and small rods, nails of various shapes and sizes, vessels, pieces of protective sheets etc. were recovered. Earlier a bronze bell inscribed with PRINCES ROYAL - 1792, of the ship was also found at the wreck site. It had a circumference of 83 cm at the top, 147 cm at the bottom, 49 cm high and weights about 100 kg. Four cannons were also found, out of these, three cannons forming a triangle were

laying at one place and the fourth cannon lay at some distance near by the group of three cannons.

### **Retrieval of Objects**

Before the retrieval, artifacts were well documented in-situ. Objects found in large quantity were retrieved through the perforated baskets. Divers took these baskets with them and filled with objects from a layer or trench with marking tags and divers on the boat pulled them up. Heavy objects were lifted with the help of lifting balloons. Before storage, objects were again documented by the archaeologists on the boat.

#### Dating

The letters were inscribed on the bell as *PRINCES ROYAL-1792*, which fits with other evidence and therefore can be accepted as the date of the ship.



The bell of the ship, inscribed with "Princes Royal 1792"



Cannons during excavation



A diver excavating a cannon



A diver retrieving an excavated pot



Excavation of upper terrace



Lifting excavated objects



The excavated brown glazed pot



Transportation of excavated debris

## Indonesia



## Conservation of Trowulan Site: The Former Capital City of Majapahit Kingdom

**Mohammad Nastsir Ridwan Muslim,** *Head of Section* Directorate of Archaeological Heritage, Ministry of Culture and Tourism

Majapahit Kingdom was one of the largest kingdom in Indonesia in the 13th to 16th century AD. The influence of this kingdom stretched from the Malays Peninsula, Sumatra, Java, Kalimantan, to the East of Indonesia. The greatness of Majapahit Kingdom was represented in the Trowulan site, in Mojokerto, East Java. The Trowulan site is an archaeological site that clearly displays the remains of a human settlement in the scale of a city. The Trowulan site is the only city site of the Hindu-Buddha classical age in Indonesia that can still be found. The Trowulan site covered an area of 9 km×11 km, which included the districts of Trowulan and Sooko within the regency of Mojokerto and the districts of Mojoagung and Mojowarno under the Jombang Regency. Having such wide area coverage, the Trowulan site showed a wealth of heritage in the form of temples, gateways, water structures, reservoirs, canal system, construction elements, and thousands of terracotta and ceramic tools used for domestic purposes. Among these findings, many sites of the remains of human settlement were also revealed.

Geographically, the Trowulan area was suitable for human settlement since it was supported by plane topography with relatively shallow ground water. Hundreds of thousands of archaeological remains of the old city in the Trowulan site were found buried underground as well as on the surface in the form of artifacts, ecofacts (animal bones, seeds, pollen, etc.), and features. The diverse artifacts that support the Trowulan site as the former capital city of Majapahit Kingdom can be observed until today. The archaeological remains and thousands of artifacts discovered in The Trowulan site are strong indications that Trowulan was an urban city at that time. Based on the archaeological research conducted in the Trowulan site, it can be concluded that the Trowulan site was built through a process of careful consideration and done by thorough planning with detailed and modern architecture that promoted local wisdom in caring for the environment. This provides proof of the accumulation of knowledge and ideas from a sophisticated civilization of the ancestors of Indonesians in the 12th to 15th century AD.

### **Conservation of Trowulan Site**

The intriguing site of the remains of Majapahit Kingdom was discovered through long and extensive research. The research on the Trowulan site has been done since the 1800s until now. Conservation activities that have been done include the archaeological excavations, site mapping, restoration, conservation of remains, increasing public appreciation on the site, etc. Year after year, more research and preservation activities were conducted on the Trowulan Site not only by the Centre for Cultural Heritage Preservation of East Java, that is responsible for conserving the site, but also by other institutions and academicians who have concern towards the heritage of the glorious Majapahit



Excavation process



Excavation process



After excavation, December 2009



Site documentation used the 3D laser scanning after excavation

Kingdom in the Trowulan Site. As time progresses, many building sites and remnants of human settlement have been excavated, restored, maintained and utilized such as the Mouse Temple (Candi Tikus), Gateway of Bajangratu, Baru Temple, Gentong Temple, the Gateway of Wringinlawang, Kedaton Temple, and the Sentonorejo Settlement.

In the year 2009, the Directorate of Archaeological Heritage and Archaeological Office of East Java, in collaboration with the Faculty of Humanities, University of Indonesia, has conducted archaeological excavations at the Trowulan site, located in Segaran site. This location was stuffed with numerous remains that showed evidence of ancient settlement. This excavation aimed to find and set boundaries on the ancient settlement units in Segaran site in Trowulan Archaeological site and to identify the patterns of the remaining housing in the rest of this site for purposes of 2D and 3D reconstruction. Excavations were carried out by horizontal excavation strategy with consideration on the target of unit residential space, while using a lot system as the excavation method. An excavation boxes, with a size of 2×2 m. Excavation were conducted from July to December 2009.

Archaeological excavations on this site resulted in the discovery of more than 240,000 fragments of the household appliances such as pottery, ceramics, barrels, plates, bowls, jars, etc and building elements such as roof tiles, *ukel<sup>1</sup>*, pipelines, bases, etc. In addition, coins, keys, jewelry, chains, and *keris<sup>2</sup>* were also unearthed. The visual documentation of this archaeological excavation has been done by using 3D laser scanner with a 5 mm level of detail conducted by Center of Borobudur Heritage Conservation. In addition, to help estimate further findings on the unexplored areas of the Segaran site, research has been done by using Geo-radar equipment made by the Agency for the Assessment and Application Technology. The Government of Indonesia committed itself to continue preserving the great remains of the Majapahit Kingdom in an integrated approach with national interests in the future.

<sup>1</sup> *Ukel* is part of the roof elements with form of curve made of terracotta (Indonesian).

<sup>2</sup> Keris is an asymmetrical dagger indigenous to Indonesia.



GPR survey before the excavation



Miniature of Majapahit houses found during excavation Segaran site in 2009



## Malaysia

## Restoration of the Ihsaniah Iskandariah Mosque: The Old Mosque of Kampung Kuala Dal, Rerak, Malaysia

**A Ghafar Bin Ahmad,** *Deputy Commissioner of Heritage* Department of National Heritage, Ministry of Information, Communications and Culture, Malaysia

### Introduction

The Old Mosque of Kampung Kuala Dal is located in Kampung Kuala Dal, Padang Rengas about 4.8 km from the royal town of Kuala Kangsar in the State of Perak, Malaysia. Built in 1936, the mosque was originally known as the Ihsaniah Iskandariah Mosque. It was named after the 30th Sultan of Perak, Al-Marhum Paduka Seri Sultan Iskandar Shah, who financed its construction costs of RM80,000 (\$23,262.58 USD). The building of the mosque was a nazar (religious gesture) by the Sultan to appreciate the recovery of his ailing child. The mosque was sited on waqaf (endowed) land bestowed by Juragan Abdul Shukur bin Mohamad Ali. The mosque was built by local Chinese builders assisted by the local community. A commemorative plaque dated the official opening of the mosque on Friday 10 Zulhijjah 1356 Hijrah by the Islamic calendar (or 11 February 1938). Since 1976, the Old Mosque which suffered severe building defects was left abandoned to make way for a new Al-Wahidiah Mosque nearby. The Department of National Heritage, Ministry of Information, Communications and Culture, Malaysia stood in the forefront to restore the Old Mosque to its original use. The restoration works on the Old Mosque took place over a period of 6 months from 22 December 2008 until 21 June 2009. The restoration works involved an amount of RM786,100 (\$228,850 USD) received from the Federal Government.

## Architectural Significance

The architectural style of the Old Mosque of Kampung Kuala Dal is a reflection of royalty, resonating from the main palace complex of Istana Kenangan (Memorial Palace) located at Bukit Chandan, Kuala Kangsar, Perak. Structurally, the mosque is a two-storey building of timber frame built using the local materials of timber, bamboo and cement. The upper level has timber flooring, while the ground level has cement floor. The prayer area and mimbar (the prayer front) are located in the upper floor of the mosque. There is a staircase en route to the upper floor of the mosque located at the side of the building. The mosque has eighteen windows, two doors and decorated walls with floral and moon-star (Islamic) motifs. Timber columns made of Merbau (Intsia bijuga) are placed on the ground floor of the mosque. They are positioned on concrete stumps fixed onto the cement floor.

The mosque is an architectural masterpiece due to distinct diamond-shaped bamboo weaving decorations (known as tepas) found on most of the walls. A special type of bamboo (buluh minyak or Babbusa vulgaris) was used to make the uniquelydesigned weavings. These aesthetically distinctive decorative bamboo walls were hand-carved and weaved by the local folks. The patterns and motifs on the mosque walls are similar to that found on the walls of Istana Kenangan. The original colours of the carvings and weavings followed the colours of the Perak flag which are yellow, black and white. Another distinctive feature of the mosque is its timber carvings found on fanlights and panels, particularly above the windows. These carvings, made of Meranti timber (Shorea parvifolia), portray flowery motifs commonly found in traditional Malay houses and palaces in the country. The intricate design features of the mosque and its distinctive colours have made the building as one of the tourist attractions in the area.

#### **Restoration Works**

A dilapidation survey conducted by the Department of National Heritage has identified the major defects of the Old Mosque comprised the timber and bamboo components. One of the timber columns was badly decayed, while the remaining columns were still intact with minor superficial decays on the surface and joints. Continuous rainfall and dampness from the leaking roofs have accelerated the decaying process of the timber structures and bamboo weavings of the Old Mosque. The bamboo-weaving walls and timber lattice panels were in poor condition with signs of ageing, rotting and insect attacks. Measures to restore the Old Mosque were determined based on building defect diagnoses. The building elements to be restored included roofing, timber floor, column, concrete staircase at entry door, timber staircase en route to upper floor, windows and doors, timber carvings; and bamboo-weaving walls. Other restoration works involved repairing defective rainwater goods, sewerage system, electrical and mechanical works; and termite treatments.

The restoration of timber carvings involved making an inventory of the original intricate patterns, and determining the size of timber panels and timber species. Defective timber carvings were identified for repair or replacement. The newly replaced timber carvings were hand-made by skilled carpenters. While the restoration of bamboo weavings involved making an inventory of the original bamboo-weaving panels by building section and location; cleaning the original intact weavings using a soft brush; and drying and repainting the weavings to their original colours.

Damaged bamboo weavings were removed and replaced with new ones. To prepare bamboos for the traditional weaving process, bamboos of 0.5 meter in length were soaked overnight to cleanse them. These bamboos were left to dry for several days before they were sliced into pieces of 0.02 mm thickness using a special machine. Bamboos of a softer texture and flexibility, similar to the original ones at the Old Mosque, were used to make new diamond-shaped weavings. Weavings were painted using the colours of the Perak flag to complete the pieces.

The special type of bamboo (buluh minyak) used to make the original bamboo weavings was no longer available in Kuala Kangsar area but could be obtained from Arau, State of Perlis located in northern Malaysia. Traditional bamboo weavings were hand-made by a handicraft entrepreneur, Mrs. Meriah Ahmad of Perlis. Expert weavers in the vicinity of Kuala Kangsar were unavailable for such work due to their old age and health factors.

### Conclusions

After the restoration works were completed, the steering committee of the Old Mosque of Kampung Kuala Dal has decided to retain the mosque for Islamic functions. The upper floor of the mosque is now used for Al-Quran reading classes; while the lower floor is used as a meeting room for the mosque committee. On 17 December 2009, the mosque was officially handed over to the mosque committee by the Commissioner of Heritage, Department of National Heritage. A brass plaque was placed at the front wall to commemorate the completion of the restoration project. The restoration of the Ihsaniah Iskandariah Mosque or the Old Mosque of Kampung Kuala Dal has marked another fruitful conservation project undertaken by the Department of National Heritage, Ministry of Information, Communications and Culture, Malaysia. This effort has underlined the importance of communication, collaboration and networking among all parties involved in the restoration work to ensure a rewarding success. They include the federal, state and local authorities; architect, building conservator, engineer, quantity surveyor, building contractor, the mosque committee as well as the local community. In the light of challenges that lay ahead, the Department of National Heritage is poised to play a major role to guide and boost all efforts to conserve heritage properties as national treasures for the betterment and enjoyment of future generations in Malaysia.



The Old Mosque of Kampung Kuala Dal before restoration. The building was in poor condition with signs of ageing, rotting and insect attacks.



The Old Mosque of Kampung Kuala Dal after restoration. Among building elements that were restored included roofing, timber floor, columns, concrete staircase at entry door, timber staircase en route to upper floor, windows and doors, timber carvings;and bamboo-weaving walls.



Views showing the main entrance of the mosque before, during and after restoration.



Interior views of the main prayer hall at upper level before and after restoration.





Restoration of bamboo-weaving walls involved making an inventory according to sections and locations, cleaning the original intact weaving panels using a soft brush, drying and repainting.



Local villagers were involved in repainting the bamboo-weaving panels.



All missing and broken timber carvings found at fanlights and panels above window were restored and repainted based on the original motifs and colours.



Experienced and skilled carpenters were engaged to do the timber carvings.





Traditional bamboo weavings were hand-made by a handicraft entrepreneur, Mrs. Meriah Ahmad of Perlis.

## Maldives



## Introduction of Cultural Tourism in the Maldives: Alif Dhaal Hanyaameedhoo

Aishath Moosa Fikree, *Curator* National Museums, Maldives

The Maldives is a small island nation state with beautiful sandy beaches, the turquoise sea, amazing coral reefs, and sunshine through out the year. These all attracts a large number of tourists and the country heavily depends on tourism as an important source of foreign income. Although Maldives has a rich history dating back to more than 2000 years, with archaeological sites on almost every island of the 1,190 islands of the country, being a developing country, not much attention or financial aid has been given to gain insight into its history and culture. The National Centre for Linguistic and Historical Research (NCLHR) is the government office under which such work is carried out. It has done a lot of work to increase awareness among the public on the importance of their heritage. Today with the fast development of the country, the need is felt to review and revive the history and culture of the country. Also with the change of government policy, the idea of expanding the paradigms of tourism to by incorporating cultural heritage has been underscored.

The heritage sites in Alif Dhaal Hanyaameedhoo of Maldives have been chosen to develop as the pivot island for the introduction of cultural tourism in the Maldives by our President, H.E Mohamed Nasheed, upon the discovery of several important historical missives and grants relating to Hanyaameedhoo from the President' s office. These documents provided a unique insight into the history of the island and the heritage sites within its boundary. The discovery of the documentation provided the government with an incentive for a precedent to develop successful heritage tourism that not only benefits the people economically but also gets them back to their heritage. It also gave people an opportunity to be involved in developing a system of heritage management that was multifaceted and multidimensional in context.

The isolated nature of heritage sites in the Maldives has been one of the key reasons why their interpretation seems bland and disjointed. However with these documents to be translated and interpreted, this particular opportunity is important to bring about a factual historical context to some of the local heritage sites of the island of Alif Dhaal Hanyaameedhoo. Thus a project has been devised to use these historical documents to develop an interpretive thread linking among the different heritage sites in the island. The missives and grants are to be used as an interpretive tool to understand the ancient mosque, graveyard and the shrine housing of the grave of Sultan Kalaafaanu. This project has been divided into two phases, the first of which was to develop a small interpretation of the site and initiating the project. This was done for 17 October 2009 commemorating the martyrdom of Sultan Kalaafaanu. In the second phase, the site is to be fully prepared as the heritage site with visitor facilities and additional establishments such as an exhibition area, souvenir shops, rest rooms to revitalize cultural tourism. The second phase of the project is now under way and is planned to be completed in three years.



The ancient mosque at the back, the flagged shrine of Sultan Kalaafaanu, and the well of the mosque.



The documents room of the mosque, developed as the interpretation room in the first phase of the project.

## Mongolia



## Archaeological Site: Kherlen Bars Tower

Munkhjargal Nergui, *Cultural Assistant* Mongolian National Commission for UNESCO

Since the ancient times, nomadic populations of Central Asia have been inhabiting in the present territory of Mongolia and alternately establishing their governments. Therefore many historical and cultural monuments attesting to the nomadic civilization of Central Asia have been preserved and kept in the Mongolian territory. As is shown in archaeological survey, about 200 ruins and remains of ancient towns are located in the territory of Mongolia. One of these monuments is the ruin of an ancient Kherlen Bars town, which was built over 1000 years ago representing the historical period of the Kidan-era.

The Kidans<sup>1</sup> were descended from an ancient people known as the Dunhu, and are generally considered to have shared a common ancestry with the Mongols. The territory administered by the Kidans extended from the Pacific Ocean to the Mongolian Altai Mountain and from the Tuul River of Mongolia to the Great Wall of China. The Kidans themselves developed an unusual culture combining features from the nomadic and sedentary civilizations. They made significant progress in the construction of towns, temples, stupas and stone bridges. The evidence of this is Kherlen Bars Town in the territory of Mongolia. The ruins of Kherlen Bars Town are not studied well.

According to the archaeological survey in 1953, the two towers were revealed near the ruins of Kherlen Bars town. The ruin is located at 95 km to the west of Choibalsan town of Tsagaan-Ovoo soum of Dornod province in the eastern part of Mongolia. The main wall of the ruin is 1600-1800 m long on each side, 4 m thick and 1.5-2 m high. To the south west of the wall there is a trace of a small stone wall on an elevated earthen platform and foundations of four buildings are visible within the wall. Also remains of more than ten square buildings with dimensions of 5-6 m are located in the vicinity. Formerly two five-floor and sevenfloor towers having interior wall paintings were located inside the wall, but the five-floor tower was entirely destroyed during the 1940s. Currently only the seven-floor tower remains standing from the town until today without any reconstruction which is one of the very few ancient monuments bearing out their former features, structures and decorations.

In 1953-1955, an archaeologist Kh. Perlee assumed that the town was used as a worshipping place. The evidence can be found from the remains of skillfully carved Buddha statues and decorations of Buddha relics which dominate among the findings from excavations at the site as well as brick sculptures with different sizes, ceramic rooting tiles and sculptures, carved wood, bones and metal objects. It is possible that the town has possessed considerable military importance serving as a military barrack for a certain period.

Existing seven-floor tower is 16 m high and octahedral and built by wood and brick. Each floor has a small window with the size of 40 x 60 cm. The base is three meter high from the bottom with the shape like the lotus. It is tapering from this base and the top is one meter. At present this tower is facing the verge of collapse and became very vulnerable to erosion. Also interior wall paintings and decorations of the tower have been exploited and in danger of disappearing by the inappropriate actions of local people, tourists, wild animals and livestock.

This tower of Kherlen Bars is an outstanding example of a type of construction and architectural assembly, which illustrates a significant stage in the history of the Kidan Empire.

<sup>1</sup> "Kidan" can be written Hitan, Kitan or Khitan. They originally located at Mongolia and Manchuria from the 4th century, and established the Liao Dynasty (916 - 1125).



Зураг 88. Барс-1 хотын долоон давхар суваргын зүсэлт (Х.Пэрлээгийн-хээр)

Cross sections of Kherlen Bars tower



A view from inside



A complete view of the tower



Location



The top of the tower

## New Zealand



Preservation of the Bendigo Bakery at the Bendigo Goldfield, Central Otago, New Zealand: Stage 2 – Stabilisation and Archaeological Investigation –

Matthew Schmidt, Regional Archaeologist, Otago/Southland The New Zealand Historic Places Trust

### Introduction

The first report on Stage 1 of the stabilisation project of the Bendigo Bakery described the history of the ruin, why the building is archaeologically significant to the 19th century gold mining period of Otago, how the project to stabilise and investigate the bakery would proceed and the parties involved in the project.

This second and final report on Stage 2 of the project briefly presents the results of the stabilisation and archaeological investigation of the bakery undertaken from the 2nd to the 4th of September 2009 and describes how the ruin will be managed in the long term to preserve this significant structure of the Otago goldfields.

### Stabilisation of the Stonework

The most crucial element of the project was to ensure the remaining stonework of the bakery was stabilised in a manner where the building could be managed in the long term as a 'heritage ruin'. This also meant balancing the need to change the structure by introducing mortar and stone to make the building weather tight and safe for visitors, against the need to retain the look and feel of the structure as an abandoned historic building. It was considered that the bakery only required minimal intervention to the stonework to make the building safe and to preserve its archaeological integrity (Figures 1 to 5).

Stabilisation of the stonework entailed re-pointing of stonework where mortar had deteriorated and in areas where mortar was missing; capping on the top of walls where weather was causing or could cause further deterioration of a wall; the introduction of stone to areas of the structure where collapse of stonework was imminent or highly possible in the near future (stone introduced was sourced immediate to the area requiring intervention).

In figures 6 and 7 can be seen the capping used on the top of the walls to make the walls more weather tight. The climate in Central

Otago varies greatly over the year from very hot dry summers to below freezing winters. The 19th century schist buildings in this region were often mortared using a mud/sand/lime mortar mix which does not expand or contract greatly with the large fluctuations in temperature, and so this mortar works nicely with the characteristics of schist. However, when the top of a wall is exposed to rain, ice and frost, for example, the mortar and therefore the wall begins to deteriorate quickly. Capping of the bakery walls involved mortaring schist slabs and pieces in place to produce a slight angle in the capping so water can run off the top of the wall, hence discouraging water to peculate down through the structure. Figure 8 shows the window sill on the front wall of the bakery being re-pointed to also encourage water to run off this exposed area of stonework. The mortar recipe used was based on an analysis of the mortar from the ruin itself.

Figures 9 to 11 show the back wall and chimney of the bakery before and after stone was introduced to these areas to stabilise these locations from possible collapse. The stone used has been resourced from directly below the structure and the location of each new stone was recorded so future manager's of the bakery will know what stone was introduced, when and where.

#### Investigation of the Oven

The investigation of the oven area of the bakery had three aims: 1) to determine whether the mound of earth and stone was actually the remains of the original schist oven structure; 2) whether any brickwork from the actual bread oven or ovens which lay within the schist oven structure had survived; and 3) if any of the oven structure was present, how best to manage the archaeological remains.

Prior to excavation, it was clear that the 'mound' at the back of the bakery was certainly partly the product of debris being bulldozed around the back of the ruin in the 20th century. Only through direct investigation, however, could the nature and extent of any



Figure 1. Bendigo Bakery ruins before stabilisation (photograph: Matthew Schmidt).



Figure 2. Bendigo Bakery ruins before stabilisation (photograph: Matthew Schmidt).

archaeological remains be determined. In Figures 12 to 18 can be seen the remains of the oven structure being revealed through the excavation of the 'mound'. The investigation confirmed that the 'mound' was a culmination of debris from 19th century activity around the bakery, such as from occupation of buildings which use to be present on either side of the ruin, and some 20th century rubbish. A small amount of the 19th century material located up against the original stonework was probably deposited in the late 19th century, but the majority of fill was pushed up against and on to the sides of the remaining stonework of the ovens sometime in the later 20th century based on random 20th century rubbish mixed in with 19th century material.

The limited excavation showed that the rectangular oven structure was constructed of schist stone and some river worn boulders and measured 4 m in length and 3 m in width. The vertical height of stonework remaining measured from a maximum of 1.2 m high at the front wall of the oven down to 20 cm at the back of the structure. On the interior back wall of the bakery where the actual brick bread oven or ovens would have been accessed, the remains of brickwork were found (Figure 9). Judging by the height of this brickwork and knowledge of other surviving 19th century bread ovens, such as at the Macetown gold mining site, Lauder farmstead in the Maniototo and the Princes St. ovens in Dunedin, it is possible the original schist oven structure could have measured ca. 1.6 m – 1.8 m in height. The original oven structure would

therefore have been a significant size (see Figure 19).

After exposure of the remnant oven walls, it was decided not to excavate into the mound of debris which covered the remainder of the structure. This was because not only had the aims of the project been satisfied, it was clear this area of the bakery ruin had 'settled' over the decades and that compromising the mound would mean any archaeological remains revealed would then have to be managed in the long term. There was therefore no need to further disturb a site which was in a stable condition.

From the archaeological investigation, it is apparent that the bread oven structure and the brick ovens themselves have not survived for two main reasons. Firstly, most of the stonework and bricks were probably plundered soon after abandonment of the building, hence the lack of bricks found anywhere on the site during the project. Secondly, exposure of the oven structure to the weather over many years has caused collapse of any of the remaining structure in on itself. That any remains of the oven are preserved today was unexpected and a positive outcome for the project.

### Long Term Management of the Bendigo Bakery

The Bendigo Bakery is now being managed as a stable heritage ruin (Figures 19 & 20). This entails monitoring of the building with an annual visit to check on movement of any stonework and to check and maintain the mortaring undertaken. During the three



Figure 3. Bendigo Bakery viewed from the back before the mound was investigated to determine if any thing remained of the bread oven structure (photograph: Matthew Schmidt).



Figure 4. Another view of Bendigo Bakery from the back showing the left side of the mound before it was investigated (photograph: Matthew Schmidt).



Figure 5. View of Bendigo Bakery from the back showing the right side of the mound before it was investigated (photograph: Shar Briden).

days of stabilisation and investigation, photographs were taken from eight angles around the building and over the walls. These photographs will be used as reference points for the monitoring. The oven structure has now 'settled' from the investigation and the weeds which have become established will be replaced by a grass species appropriate to the environment to consolidate the fine soil on top of the remains.

Work still to be undertaken at the Bendigo Bakery includes installing drainage to stop water pooling on the right and front sides of the building, bollards to keep traffic away from the walls, and an interpretation panel explaining the history of the ruin.

### Acknowledgements

This project would not have been possible without the Otago Goldfields Heritage Trust who provided financial support for the project and volunteered their time during the stabilisation and archaeological investigation (Figure 21). Also crucial to the project was the Central Otago Area Office of the Department of Conservation, the Otago Polytechnic Stone Masonry Course in Cromwell, stone mason Keith Hinds and the New Zealand Historic Places Trust (Figure 21).



Figure 6. Left wall of the bakery before and after capping to protect the wall from the affects of the weather (photographs: Matthew Schmidt).





Figure 7. Right wall of the bakery after capping (photograph: Matthew Schmidt).



Figure 8. Re-pointing of the mortar and capping around the window sill on the front of the building (photograph: Matthew Schmidt).



Figure 9. The inside back wall of the bakery with some of the loose debris and soil removed prior to stabilisation of the wall and chimney (left of photograph). The brick bread oven(s) was originally accessed between the left measuring pole and the red vertical line. The red arrow indicates remnants of brickwork from the opening of the bread oven(s). It appears that the opening to the oven(s) was about waist height as below the red arrow the back wall is solid schist stonework (photograph: Matthew Schmidt).



Figure 10. Inside back wall of the bakery after stabilisation. Schist has been dry stacked against the right side of the chimney to prevent any future movement of original stonework and along the front wall of oven structure. The large vertical schist slab used to stabilise the chimney is a lintel found beneath where the oven(s) opening would have been located in the back wall. The red arrow indicates remnants of brickwork from the opening of the bread oven(s) (photograph: Matthew Schmidt).



Figure 11. Stonemason Keith Hinds mortaring in schist slabs to stabilise the right side of the chimney. Each slab introduced was recorded (photograph: Matthew Schmidt).



Figure 13. Half of the left wall of the oven structure exposed during the investigation (photograph: Shar Briden).



Figure 15. Exposure of the left and back wall remnants of the oven structure completed (photograph: Matthew Schmidt).



Figure 17. Stone and soil debris and the 19th century artefacts in the fill (circled) pushed up against the right wall of the oven structure (photograph: Shar Briden).



Figure 12. The left wall of the oven structure beginning to be revealed during the investigation (photograph: Shar Briden).



Figure 14. The final length of the left wall being excavated and the back wall excavation underway (photograph: Shar Briden).



Figure 16. Investigation of the right oven wall underway (photograph: Shar Briden).



Figure 18. Right oven wall completely exposed (photograph: Matthew Schmidt).



Figure 19. Oven structure two months after stabilisation. The site has settled and weeds have grown in the light soil. The weeds will be replaced by a hardy grass species which will aid in consolidating the surface. A possible shape of the original oven structure is indicated by the red dashed line in the top photograph (photographs: Matthew Schmidt).



Figure 20. Front/side views of bakery two months after stabilisation. Drainage around the front and sides of the building will be installed soon as well as an interpretation panel and bollards to keep vehicles away from the structure (photographs: Matthew Schmidt).



Figure 21. People involved in the stabilisation project. Left photograph- From left: the author from the NZ Historic Places Trust, Mark Harrison of the Department of Conservation, Martin Anderson - President of the Otago Goldfields Heritage Trust, archaeologist and viticulturalist Joan Lawrence, Roberta Laraman of the Otago Goldfields Heritage Trust, archaeologist Shar Briden of the Department of Conservation.

Right photograph – back row from left: Stonemason Keith Hinds, five stonemasonry students from the Otago Polytechnic stonemasonry course in Cromwell, stonemasonry lecturer Steve Holmes from the Otago Polytechnic, Mark Harrison of the Department of Conservation; front row: Shar Briden, Marion Sutton and Amanda Ware of the Department of Conservation and the author from the NZ Historic Places Trust.

## Papua New Guinea

## The Preservation and Maintenance of the Yangit Female Initiation Ceremony in Papua New Guinea

Naomi Faik Simet, Dance Researcher Institute of Papua New Guinea Studies

Male and female initiation ceremonies in Papua New Guinea (PNG) are ceremonies held to celebrate the achievements of young boys and girls into adolescence. Each of these ceremonies differs among ethnic groups. In many parts of PNG, male initiation ceremonies are common compared to female ceremonies. Male initiation ceremonies involving all kinds of body scarification are a common feature of PNG traditional ceremonial and cultural life. In the East Sepik Province and most particularly along the Sepik River system, male initiation into the crocodile cult is a common feature. This involves the 'skin-cutting' ceremony of young boys. Young boys pass into manhood after such initiation rituals. In this context, female initiation is unheard of. However, according to oral history in the Burui Kunai Local Level Government area of the East Sepik province, initiation through skin-cutting ceremonies was the domain of the women. Only recently this initiation ceremony was taken over by the men. This event in Yangit village of the Burui Kunai area reveals this practice as belonging to the domain of the women. This is to say that women in this area are still initiated through 'skin-cutting' ceremonies. This practice has been maintained in this area, from the past until today.

by women. Such research carried out on the role of women in traditional societies is vital to understanding gender roles and the relationships that exist between men and women.

Preliminary research on the *kraku-bandi* ceremony was carried out by staff of the Institute of Papua New Guinea Studies (IPNGS) in October 2008. A more thorough study was undertaken this year to record and document the whole process of *kraku-bandi* female initiation ceremony. This work took approximately two months to complete.

The continuation and maintenance of such initiation ceremonies in PNG is important in strengthening the marginalised role of women in different PNG communities. In addition, such ceremonies are rarely performed today and the research and documentation conducted by the IPNGS was timely in preserving this rare ceremony.

The female initiation ceremony is undergone by women who have experienced their first menstruation. The ritual ceremony is preceded by an all-night ceremonial dancing. The ritual of skincutting is done in the morning; in an enclosure outside of the menstrual house at the edge of the village. After the skin-cutting has been done, the young girls enter the menstrual house and remain in seclusion until the day set for their emergence back into normal life. The aim of the skin-cutting ceremony is to release blood that belongs to the young girl's mother and her relatives especially, her mother's brothers. After this is done, the young girl is expected to make new blood for herself during the seclusion period. This is symbolised through the payment that is made by the young girl's father and his relatives to the initiate's maternal relatives. The new blood enables the young girl to be productive for her role as a young woman who is now ready for marriage and motherhood.

During the seclusion period the young girls were taught the knowledge and skills needed for their future roles as wives and mothers. They were taught the techniques of child-birth and rearing, trade systems involving the exchange of sago with fish (only a woman's activity), sacred knowledge maintaining women's power, etc. Men, on the other hand, also practice male initiation ceremonies that are respected



A female initiate showing scarification work done on her during the skin-cutting process



The Gunge Takwaku dance associated with the female initiation ceremony; only women who under-went this ceremony are allowed to dance.



Yangit female initiates during the emergence ceremony

## Singapore



## Engaging the Community: Marking of Heritage and Community Trails in Singapore

**Faith Teh Eng Eng,** *Deputy Director (Collection Services)* Heritage Conservation Centre, National Heritage Board - Singapore

Acknowledgement: Contributions and inputs from Ms Thangamma Karthigesu, Director and Ms Soo Hui Wah, Deputy Director of Education and Outreach Division, National Heritage Board (Singapore)

### About National Heritage Board

The National Heritage Board (NHB) champions the development and promotion of a vibrant cultural and heritage sector in Singapore. It makes heritage enriching, dynamic, relevant and accessible to different audiences through staging innovative programmes; using state-of-the-art technology; and forging collaborative partnerships with both private and public sector counterparts. It also manages both national and public museums, the National Archives of Singapore, and the Heritage Conservation Centre. NHB was formed on 1 August 1993 as a statutory board under the Ministry of Information, Communications and the Arts (MICA), with the merger of the National Archives, National Museum and Oral History Department of the Ministry of Information and the Arts.

Today, NHB operates six museums with a record of 1.86 million visitors in the first quarter of 2008. NHB also oversees the National Archives of Singapore, which also runs two World War II Interpretative Centres: Reflections at Bukit Chandu and Memories at Old Ford Factory; the Heritage Conservation Centre; and recently in April 2009, and the National Art Gallery, a new museum of contemporary art which will be opening sometime in 2014. NHB also took over the administration of three other heritage institutions which are community-based.

Besides, the wide range of exhibitions and programmes offered by NHB museums for different target audiences to promote a museum-going culture, NHB is also active in organising educational and community outreach programmes to bring heritage to the people. NHB's programmes attracted participation and visitorship as high as four million during the first quarter of 2008.

### Marking of Heritage and Community Trails

One significant roles of NHB has been marking Historic Sites and in the recent years, the marking of Community Trails which are of socio-historical significance to Singapore. This is to remind Singaporeans of their history. Since 1999, NHB has embarked on Heritage Trail projects either on its own, or in partnership with external agencies such as the Urban Redevelopment Board, National Parks Board, Singapore Tourism Board and the Land Transport Authority. To date, there are 86 Heritage Sites and two permanently-marked Heritage Trails namely, the Civic District Trail (1999), Singapore River Trail (2005), which has specially-designed street furniture and trail brochures. Heritage Trails have proven to be popular amongst Singaporeans, young and old, and have been effective tools to bring heritage alive for the people. In 2006, NHB has also moved on to develop Community Trails, to focus on the documentation and promotion of community history, especially the heartlands of Singapore, besides covering Singapore's history in general. The marking of Community Trails is an important initiative spearheaded by the Education and Outreach (EDO) Division of NHB. To date, four Community Trails have been marked<sup>1</sup>. There are also 61 National Monuments which the Preservation of Monuments Board is overseeing.

Unlike sites which are known for major political events like revolutions, wars or major watersheds in history, these Community Trails may seem rather unimportant in comparison. Although these community sites may seemingly not qualify the status of being historically significant, they are important because these sites are places of common interaction, which gave birth to countless shared memories and history; elements so important for one's identity and sense of belonging. People's social history and memories are part of the nation's history, as they are closely interlinked. Such engagement with the people and community has an essential role in our nation-building process, especially in a multi-racial and cosmopolitan country like Singapore.

Hence, it is supported by government agencies like the Housing Development Board (HDB), and the Community Development Council (CDC), as well as the grassroots, Citizen's Consultative Committee (CCC), residents, and schools. EDO works closely with the community and these agencies document and research into the stories and events that happened at the trail sites. Besides buildings which are of architectural merit or historical significance, the Community Trail also includes places which are social nodes where the local community interact, or interesting places which are iconic or unique to the area, including eating places, local shops and places of worship. This 'ground-up' approach encourages involvement, instills a sense of ownership and belonging to community as well as the nation. Oral history interviews were also carried out with the older residents, and donation of artefacts and photographs were collected. The documentation that comes in the form of research information or oral history recordings and collection, represented a shared history, fond memories and characteristics or experience unique to that community. Feedback from the residents on their proposed trail sites was also solicited.

The main objectives of the Community Trail project are closely tied to nation-building. It reaches out to the descendents of the old residents or the younger generation of Singaporeans who lived in the community, especially the Permanent Residents and the New Citizens of Singapore, as well as Singaporeans who do not live in these areas. This project also aims to inculcate a sense of identity, to promote social cohesion, racial harmony, and to heighten the sense of place and familiarity and rootedness to Singapore. Community and family bonding is promoted as people gather and participate in activities to learn more about uniqueness and the interesting stories of their community. Community Trails also promote cultural tourism, as increasingly, tourists are interested to visit the heartlands to get an authentic experience and better understanding on the Singaporeans' way of life.

There are two phases in the development of a Community Trail. In the first phase, NHB and relevant agencies such as CDCs put in place the infrastructure for the Community Trails and the official launch of the trail. This could include specially-designed street furniture (trail markers or story board), trail brochures, websites, or publications, depending on availability of funding and feasibility. All the trails have brochures: Balestier and Jalan Besar Trails have street furniture and brochures, while Queenstown Trail has trail brochure and a publication. To widen its reach and accessibility, information of these trails is made available in NHB's website. The second phase looks at how NHB and relevant agencies work with the community, especially schools and the grassroots to develop programmes to encourage the residents and various interest groups to walk these trails, to ensure their sustainability and community ownership. Volunteer trail guides were also trained.

Since the launch of Community Trails, NHB's Community Trails have created much interest and buzz in schools, the community and other agencies. Many have come forward to approach EDO/ NHB for advice either to develop their own trails, or to work with NHB to develop new trails. In the next few years, with more community trails marked and developed, Singaporeans as well as tourists will be spoilt for choice for interesting places to explore and discover right in their own backyards. There are indeed many hidden gems and interesting nuggets of history in different parts of Singapore, besides the familiar Civic District and Singapore River, or the ethnic enclaves, which Singaporeans can be proud of too.

<sup>&</sup>lt;sup>1</sup> Balestier Trail, Jalan Besar Trail, Bukit Timah Trail, Queenstown Trail

## Sri Lanka



## Conservation of Old Dutch Hospital Building, Galle Fort, Sri Lanka

Sujeeva Kaushalyani Peiris Deraniyagala, Conservation Supervisor Central Cultural Fund

The Dutch Hospital is an elegant 17th century building located between Akersloot and Aurora bastions inside historic Galle Fort, a World Heritage Site in southern Sri Lanka. It is located bordering the Hospital Street on the west and the rampart walls and Indian Ocean on the east. There are less than five buildings within the whole fort with architecture, setting and magnitude similar to the building. During Portuguese occupation the official mint was sited here and the Dutch developed it into a hospital. The British further developed the building adding to its length and another wing to east, making it their Courts Complex. After the Island gained Independence, the building was used as the Divisional Secretariat of the Southern Province of Sri Lanka.

Presently the building reveals mainly the English period developments with original Dutch constructions limited to the southern part. This two-storey building has long colonnaded verandahs in both floors and the typical Dutch half round tile roof was covered with asbestos after independence. The Building stands on a rubble foundation and its walls are mainly cabook\* (laterite) and bricks. Doors and windows are glass and timber while ground floor is cemented. Most of the upper floor is laid with polished timber. There are timber door / window sashes, hand rails, stair ways and grills elegantly detailed. Square masonry columns formed the arches and complete the picture of dreamy architecture of the middle ages.

The Dutch Hospital building also had to undergo many changes to meet the 21st century requirements which unfortunately made negative impact on its historicity and architecture. Several institutions occupied the building after 1980 and they made some devastating changes to its interior and neglected the exterior. Toilets, electricity, plumbing, air conditioning and partitioning were the main requirements and in introducing these modern amenities building's architecture was totally ignored. Half round tile roof was laid with asbestos for easy maintenance. The long eave, which is a salient feature of Dutch architecture in Asia, was shortened in order to remove the deteriorated members. When a timber sash of a door or a window needs a repair, it was replaced



HOSPITAL BOAD ELEVATION/WEST ELEVATION

with a glass or simply sealed off. Timber deck on the upper floor was cement rendered. In some places toilets were added on top of the deck, which recently resulted in a disastrous situation.

But the heaviest damage is caused by negligence and abandonment. Institutions just happened to be there totally ignoring the historical and architectural value of the building, mostly because they could not afford to maintain such large building while finding it difficult to survive themselves with their meager budgets. The 2004 Tsunami hit badly and heavy rampart walls of the Fort also washed away in some parts. Dutch Hospital building was also exposed to direct lashes of huge waves that swept through the broken rampart walls. Old plasters were washed away and those remaining were affected with efflorescence. It is important to identify limits of conservation procedure as this building has combination of several additions and developments made through considerable span of time. Pre- Independence architectural ambience of the building is a mixture of Dutch and English styles which has been combined to give pleasant appearance. It is the post independence changes that counted for the present unacceptable appearance. Although building's strong architectural character, form and scale has been able to absorb and hide most of these later additions from outside their toll is taken its interior character and appearance to a greater extent.

One can identify three distinct construction phases:

 South wing: This is the oldest part built in the Dutch period. Coral stone was the major building material. This part has







Elevation to the Hospital Street





Abandonment and negligence in extreme!

granite paved floors and thick plinth walls. The corridors facing the hospital road were closed during the British period using a brick wall.

- North wing: The building was extended along the same ground plan towards north during the British period. Bricks were used as building materials and glazed windows glazed fanlights introduced to this section.
- East wing: This is extending towards the sea starting from the middle of the building during late British period.

These separate constructions were cleverly executed that they appear as one entity from outside. Most components of the building, suffered effects of closeness to the sea, natural elements, bad usage and negligence for a considerable time. Even though the structure looks sound it could not be safely leave without attention for no one could not guess the effects of time. Several research programmes to analyze the condition of the building has been carried out in collaboration with the Department of Archaeology [excavation to determine details of foundations] and the University of Moratuwa [analysis of plaster samples to identify the mortar mixture].

### CONSERVATION PROPOSAL

 Roof: In tropical regions, a roof plays a dual role; one is giving its character and the other is protecting it from the natural elements. The original roof of the Old Dutch hospital most probably was a gable one with half round tile cover. There have been several changes to the roof during the British period and in the post independence period. Considering all these it is proposed to relay the roof with asbestos sheets with covering tiles after extending the eaves to the original position.

- 2. Floor
  - a. Ground floor Although the best material would be dressed granite slabs because of easy maintenance and resistance to wear and tare, it is decided to cement render the floor as a rescue measure.
  - b. Upper floor Original timber decks are to be repaired by removing the cement rendering.
  - c. Stair ways All three stair ways are worn out and need extensive repairs. Specially the one at the North wing has worn off severely and this must be strengthened properly. Deteriorated members must be replaced with matching ones.
- 3. Wall plasters These are heavily weathered and in some parts missing. Growth of moss and fungi, trees and small plants made further damage and contribute to the pathetic appearance of the building. Detached plasters will be removed and the whole building will be re-plastered with compatible mixture. If the ancient plasters at the two corner rooms of the South wing could be strengthened with glue and keep it would be ideal.
- Doors and windows All doors and windows will be brought back to their original design and they should be complimentary in character. It is recommended to remove paint layers to expose the timber.

When the World Monument Fund called project proposals for tsunami affected historical buildings, President of ICOMOS Sri Lanka has submitted application of this monumental building to the WMF in 2006. Since the WMF was not in a position to foot the total conservation work, they have agreed to fund the



South wing - the oldest part



Masonry colimns of ground floor

documentation and rescue conservation with the assistance of American Express Bank. The rescue conservation work commenced with the grant which was about 1/10 of the total budget required for total conservation. One major obstacle for the conservators is that they have to carry out the work while the building is in use as the institutions are reluctant to move out.

Presently documentation of the building is completed and rescue conservation is in progress through the ICOMOS Sri Lanka. Another setback occurred during the conservation when a section of the upper floor was collapsed and resulted in collapse of columns on ground floor. A section of 40 feet long stretch was damaged due to this collapse caused by haphazardly constructed toilet. This toilet was built on the timber deck and water seepage through a long period of time resulted in decay of timber and finally the deck gave way due to the weight of the concrete slab.

Several institutions help the ICOMOS Sri Lanka to achieve their goal. When the rescue conservation completes in another three months the old Dutch Hospital building at Galle Fort will proudly stand out as a sentinel safeguarding the architecture of a by gone era.

Photos and Drawings credits: Jayatissa Herath Associates [Consultant Architects for the rescue conservation]

*Note: cabook\** is earthen material used to construct buildings in the 19th and 20th centuries. It is cut off from ground and naturally hardened with exposure to the environment.

Hashan The man

SEA SIDE ELEVATION (EAST ELEVATION)



Partitions and broken timbers of upper floor

Deteriorated timbers of the stairways

Unsafe electrical wiring

## Thailand



## Thailand's Cultural Heritage Protection Using GIS: Part II - Prediction of the Disaster Impact on Ancient Monument by GIS -

**Wirayar Chamnanpol,** *Computer Technical Officer* Office of Archaeology, Fine Arts Department, Ministry of Culture

The Office of Archaeology in collaboration with UNESCO Bangkok and the Geo-Informatics and Space Technologies Development Agency (GISTDA) successfully organized the GIS workshop on "Cultural Management in Thailand and Lao PDR" for Thai staff of the Archaeology Office and those from Lao P.D.R. The workshop focused on the application of GIS for cultural resource management using case studies of Sukhothai World Heritage site of Thailand and Vat Phou World Heritage Site of Lao P.D.R.

As a result, the Office of Archaeology developed the specific GIS cultural properties database be used as a tool for spatial information. This data represents information in cultural properties layers and spatiality to its surrounding environment. This content can help understanding the problems, finding solutions and making decisions for policies in cultural resources management and providing GIS data services to the public.

### Prediction of the Impact of Disaster on Ancient Monuments by GIS

The Office of Archaeology does not only use GIS to manage database, but also to predict the impact of disaster on ancient monuments such as flood, fault, landslide, sinkhole, creep, and bank erosion. Most disaster impacts in Thailand's ancient monument are caused by floods in monsoon season and geo/ seismic hazards along three main faults: (1) the northeastern-southwestern; (2) the northwestern-southeastern; and (3) the north-south faults, which cover nearly a third of the country.

The Office of Archaeology has used GIS to analyze and study an impact of disaster by identifying information and analysis method to use and examining how analysis results benefit the users. For example, once ancient monuments in a higher-risk flooding zone are identified, GIS database is used for mapping process and buffering river by considering flooding zone statistics. The database will generate multiple outputs showing the sites in the flooding risk zones. In the case of an earthquake, even though Thailand does not have suffered serious damage of earthquakes,



Figure 1: A map of risk cultural heritage (Registered ancient monument) and active faults in southern Thailand

active faults should not be overlooked. Results of geo-hazards risk zone mapping will provide the necessary information to be used for ancient monuments protection planning. Output maps can be displayed in a digital or printed format. Output data can be presented in tabulation or graph. Although an emphasis on Thailand's GIS application is mainly for mapping purpose, the software is more flexible to allow alternative display formats for the outputs to suit users' different needs.

In Thailand, GIS is utilized in the field of cultural resources data collection, organization, retrieval, maintenance and communication. It can also store, manipulate, combine and analyze multiple and complex data sets such as Catchments Analysis and View Shed Analysis . GIS is also used to interpret the relationships of sites to their social landscapes. Simulation, a means of testing hypothetical predictions and data generation, is, however, used to identify key variables and their interactions for problem formulation.

Analyzing cultural heritage data with GIS can produce various outputs: creating buffers, overlaying layers, selecting locations and attributes, exporting selected features, adding fields into an attribute table and calculating attribute values. In the planning phase, it is required users to decide what data is needed to meet the criteria, then assemble and prepare the data for analysis.

### Steps Forward

The Fine Arts Department realizes that conservation and protection of national cultural heritage are also everyone's responsibility, not only the Fine Arts Department. The Department, in fact, needs to also raise public awareness in cultural heritage protection and to provide the knowledge and information on national cultural heritage to the public and other institutes. In particular, knowledge and information sharing among people living in the ancient areas can significantly build up positive perspectives towards cultural heritage protection in their communities. With GIS data, consequently, the government can efficiently plan for sustainable infrastructure development projects in the historical districts such as water management in the areas near ancient city walls or moats; infrastructure construction not to ruin the scenery or not to affect structures of historical buildings; permitting for drilling rough areas for state land use and town planning for development of historic areas; and land measurement and investigation with the Fine Arts Department and with the Treasury Department if the block is superimposed on historic areas, city walls and moat boundaries.

<sup>2</sup> View Shed Analysis is a study of visible regions surrounding the site.



Figure 2: Maps of risk cultural heritage (registered ancient monument) and flooding zones of the Chao Phraya and other rivers of Thailand

<sup>&</sup>lt;sup>1</sup> Catchments Analysis is an analysis of the accessible regions surrounding the site.

## Viet Nam



## Binh Lam Tower : the Restoration and Conservation Issues

**Nguyen Khanh Trung Kien,** *Laboratory Officer* Center for Archaeological Studies, Southern Institute of Social Sciences

### 1. Introductio

Binh Lam is one of early dating Champa towers in Central Vietnam. It is located at Phuoc Hoa hamlet, Tuy Phuoc district, Binh Dinh province. Henry Parmentier, a French scholar surveyed this site in the 1900s and made a nice documentation about the tower with highly detailed drawings.

The tower can be date back to approximately the early 11th century, and classified to Chien Dan Style or transition style between My Son A1 and Binh Dinh Styles in the ancient Champa art. Binh Lam Tower was built on a paddy field, not as other Champa towers which were usually built on the top of hills.

The tower was composed of three parts: the base, the body, and the top. The main gate faced to the east. The base was built of bricks, with the length of 11.50 meters in the square shape. The upper body was built straight up with four columns each side. The entrance gate was fallen down; three decoration gates were on the other sides. The top of the tower looked like a miniaturized body of the tower. There were some cracks on the northern and western side walls of the tower. The decoration gate and decorative items on the south side wall were in good condition.

#### 2. Excavation and the Artefacts

By the end of 2008, this site was excavated for the first time to study the foundation in order to prepare for the restoration project in the near future. The archaeologists excavated the base, an underground structure in front of the main gate, and studied the restoration process of Cham people in a few centuries ago. They also found a block of broken bricks repaired by glue. It was the Cham people's repair measures for the damaged bricks caused by the flood in the past. The decorated foundations in the north and south side of tower also exposed. It was damaged and repaired by raising the height of foundation to prevent the flood water immersion. In this excavation, we found ninety pieces of stone statues and bas-reliefs from 1.20 m to 1.50 m deep in front of the tower. It does belong to the early phase from the 10th to the 11th centuries. Beside of the Go Sanh ceramics of Cham people, we also unearthed Ming ceramics with 156 pieces of bowls, discs, etc. Ting ceramics were not so many here, just only seventeen pieces. Most of ceramics presented here were popular products by the trading network between China and Champa in those days.

#### 3. Restoration and Conservation the Binh Lam tower

In the 2008 excavation, the foundations of Binh Lam tower were exposed and after documentation here, the archaeologist filled up meshes, sand and soil to protect them from the environmental deterioration. How to restore and conserve this architecture was a difficult question for the conservators. Restoration work is easier than conservation process. We could repair the damaged structure by comparative method with the originals, but we could not maintain the repairing structure for a long time because of the harsh weather of coastal central Vietnam, especially in the rain season with many typhoons, heavy rain, flood water and so on.

The best thing we could do at present for Binh Lam tower seems to only repair the walls and the upper structure, but the







foundations underground will be protected better by filling up soil layers. For the public exhibition, we should use the 3D drawings after restoration to show the original foundation structure of the tower. Restoration and conservation of the original shape of Binh Lam Tower is important and hard work but how to protect it from natural disasters is the most important project for us. References

- 1. *Excavation Report at Binb Lam tower* (Binh Dinh Province, Vietnam), 2009, Center for Archaeological Studies, Hochiminh city.
- 2. Ngo Van Doanh, 2002. Champa culture, Van hoa dan toc Publisher, Hanoi.





Statues of Binh Lam tower from 2008 excavation





Chinese ceramics at Binh Lam site



Terra cotta artefacts at Binh Lam site

## Uzbekistan



## News from Uzbekistan on Cultural Heritage Preservation

Akmaljon Ulmasov, Researcher

Fine Arts Scientific Research Institute, Academy of Arts of Uzbekistan

### 1. The training of an archaeology master-class

Uzbekistan attracts not only tourists with its architectural masterpieces, but also the specialists studying the antiquity, especially in the archeological monuments from the Bronze Age through the Early Middle Ages and in artefacts which include the artworks and the crafts of the ancient times. Archeological objects are considered to be the primary sources for understanding the cultural history, so it becomes more important to investigate and preserve artefacts. In line with this, the training programme for human resources development, "The Master Class on Archaeology" has been held at the International Caravanseri of Cultures which was founded by Ikuo Hirayama in Tashkent.

The training programme was carried out in cooperation with Japanese experts as usual. The main objectives of this master class were to exchange the experiences on preservation of historical monuments; to improve professional skills of specialists in the field of cultural heritage protection; to introduce new technologies in the field of restoration; and to propagate the basic restoration techniques among students of high schools and colleges. At the end of the master-class, all participants are handed over certificates of completion.

The master-class programme was conducted for three weeks in three stages:

- Theoretical: local scientists and experts delivered lectures in the field of archeology: on the history of the Great Silk Road; the diffusion process of Buddhism and its architecture in Central Asia; and the art and culture of the ancient cities.
- Practical: Participants practiced measured drawings of artifacts (stone objects, terracotta figures, pottery, etc.) by using the latest tools and techniques provided by many other countries.
- Creative Work: Students made their creative works with the pottery wheel under the guidance of a young master-ceramist.

## 2. 3D Virtual reconstruction of the Main Hall of Buddhist temple in Dalvarzin-tepa

Virtual reconstruction of ancient buildings is a useful means for imagining their original appearances and for feeling their volumespatial compositions and aesthetic views. As a good illustration of virtual reconstruction, we can take building complex at the Dt 25, Buddhist temple in Dalvarzin-tepa.

Archeological excavations of this complex have been conducted from 1983 to the present. According to the research report, the complex at the Dt-25 was located in the centre of the city, where the route (width-18m) was crossed with a small street. Reconstructing the architectural façade was much more difficult because the premises adjoined to the main hall were badly managed. However, it is possible to virtually reconstruct its original appearance of the main hall where sculptures of Buddha and Bodhisattva were placed as well as the internal view of the temple.

With three-dimensional computer drawing devices, the

3D reconstruction of the building was executed based on archeological data and estimation obtained from excavations. Archeologists and museum staff worked together with CAD experts. The advantages of using computer technologies were to give us a chance to correct its virtual image on the screen and to unable us to try our hypothesis on the image while discussing the possibilities among researches. If it is introduced in the museum, visitors can not only see the external appearance but also see interior details of the building from different perspectives. The virtual reconstruction of architectural features can be effectively used in educational institutions for the study of lost objects.

Possible areas for utilization of the virtual reconstruction are as follows:

- for the field researches in planning works, in shortening of labor expenditure and at the further registration of the field documentations;
- for preserving information on appearance of the archeological objects;
- in the occasion of decreasing human factor at carrying out reconstruction of building or structure;
- for effective monitoring and facilitates historical and cultural examinations;
- for creating dynamical geo-information system for effective management;
- museums visitors can have a visual representation on cultural landscapes, on architectural traditions of indigenous people, and it widens possibilities of the traditional museums;
- for educational institutions, it will increase the learning efficiency.

Note: 3D Measurement was designed by Angela PEREGRIMOVA, Student of Master's degree, Tashkent Architectural-Building Institute

### 3. Restoration of fragmented wall painting from Dalverzintepa

Wall painting was one of the main decorations on ancient architectural constructions, which decorated both interiors and facades of temples, administrative-palace buildings, and noble houses. Unfortunately, they have been almost destroyed or remained as in insignificant fragments. It is said that painting was usually put on clay and destroyed in due course by being exposed to the environment. For painting restorers, it is important to safeguard them and pass down to the next generations. A young expert, Sjuch Julia, restored the wall painting from Dalvarzintepa with the assistance of the author of this report, Restoration laboratory of Fine Arts Institute.

The fragmented wall painting, "the Priest and children" of the second to the third centuries A.D. was found from Dalvarzintepa in the 1980s. The fragments were unsuccessfully restored and conserved at that time, and they were considerably damaged during transportation. In addition, adhesive polymers left on a surface, and the glossy layer was formed, and blackened strongly by heat.

The following is the whole restoration process:

- The fragments were carefully studied: materials used for manufacturing, structure of paints, earlier restoration work, and characteristics of damage.
- Joining fragments: Damaged parts were joined with adhesives.
- Cleaning (1): Dirt on the surface was cleaned with distill water.
- Cleaning (2): Remaining glue used at the earlier restoration was cleaned with toluene and acetone.
- Reinforcement (1): The back of fragment was strengthened by applying plaster as a filler where plaster layer was thin.
- Reinforcement (2): The back of the fragment base was strengthened by dense fabric (2 layers) and the fabric was pasted to a surface by glue PVA.
- Cleaning (3): The plaster in cracks of the painted layer was cleaned.
- The paint layer was lined with papyrus paper and rice glue (sticking paper) for protection.
- Finishing: The surface of plaster layer was leveled with a knife.
- After removing a sticking paper, the rests of rice glue on the paint layer was cleaned with distill water.
- Lastly, missing paints on the layer was restored.

It is necessary to remember that this restoration work of wall paintings was limited only to means available in our laboratory. However, to achieve more complex investigation in structure of painting materials, we need modern equipment and technologies, and we hope that will be put in practice in the near future.

<sup>1</sup>Dalvarzin-tepa – the settlement site is located in the Surkhandarya river valley, on the bank of Karmakisai, in 120 km to the north from the Termez. Initially, the settlement was built in the southern part of the sand-and-loess plateau in the 3rd-2nd centuries B.C. Researchers suppose that the fortress wall of the Greco-Bactrian period surrounded an already existing settlement with an irregular and dense layout (a polyhedron in a plan; 170-200 m across). The destruction of the Greco-Bactrian settlement is associated with the invasion of Bactria by the Sakas (140-130 B. C). Its revival began in the Early Kushan period. The settlement was surrounded with a fortress wall, which enclosed a rectangle with an area of 32.5 hectares, built with a view to the further growth of the settlement. New fortifications were built on the remnants of the Greco-Bactrian walls, used as a plat-form. Since then the initial settlement served as the citadel. Investigates considers that Dalverzin to have been the crown capital of the Kushans Khodzo mentioned in written sources. The flourishing of the city falls on the 2nd - the first half of the 3rd centuries A. D. It had a regular layout, with clear-cut residential areas of rich and poor townsmen. At that time the settlement had temples of different religions. In the centre of the city stood a Buddhist temple, and near the northern wall - a temple of a local goddess. A residential neighborhood of potters occupied the south-western part of the settlement. A Zoroastrian "naus" (catacomb) and a Buddhist temple have survived in the northern part of the settlement.



A map of Bactria in antiquity



A topographical plan of Dalvarzintepa



A schematic plan of Buddhist temple



Axonometric projection of Buddhist temple of Dalvalsintepa



A section of room 3 (a central hall)



In process of 3D reconstruction



A view of DT-25 (GPS map)



A 3D section of room 3 (a central hall)

A central hall view from east



3D reconstruction of DT-25



Before restoration





After restoration

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