

## Discovery of Ceramics from the Koh Sdach Shipwreck, Koh Kong province, Cambodia

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### Abstract

*In February 2006 fishermen discovered a shipwreck off the southwest coast of the Kiri Sakor district, Koh Kong province in 30 m of water approximately 20 km west from Koh Sdach. Charred timber found at the shipwreck site and large irregular globs of melted metal which encase pottery pieces appear to indicate that the ship burned before sinking. The Ministry of Culture and Fine Arts and the Shipwreck Research and Salvage Committee obtained the collection, which includes cooking pots with lids, storage jars with four loop-handles of different sizes, basins, bottles, kendi, dishes, plates, mortars and porcelain and celadon bowls. During our examination of the collection we selected a representative sample of 88 pieces of ceramics. Among the recovered material we found two pieces of lacquered covered box. While the designs on the lacquered surfaces were quite faded, the basketry core was in perfect condition. The calibrated date was from 1428 to 1482 AD (95% probability). The preliminary analysis of ceramics indicates that they could originate from the Mae Nam Noi kilns in Singburi province and the Si Satchanalai kilns in Sukhothai province, both in Thailand. Furthermore, the same type of storage jars with four handles has been found in the Cardamom Mountain, in Cambodia, where they have been used for burials. In this presentation I will discuss the preliminary analysis of the material and the different ways in which the site is connected to maritime trade routes in the gulf of Thailand and mainland Southeast Asia.*

**Key words:** Cambodia, Post-Angkor, Cardamom, Maritime trade, Ceramics, Burial jars, Koh Sdach

### Introduction

In February 2006 fishermen discovered a shipwreck off the southwest coast of the Kiri Sakar district, Koh Kong province in 30 m of water approximately 20 km west from Koh Sdach Island. Charred timber found at the shipwreck site and large irregular globs of melted metal which encase pottery pieces appear to indicate that the ship burned before sinking. His Excellency Ly Yong Phat funded the recovery of some 900 pieces of complete ceramics, various artifacts and a pile of broken ceramics. The Ministry of Culture and Fine Arts (MoCFA) and the Shipwreck Research and Salvage Committee

obtained the collection, which includes cooking pots with lids, water jars, storage jars with four loop-handles of different sizes, basins, bottles, Kendi, bowls, plates, mortars, porcelain and celadon bowls. The material is currently stored at the Provincial Court in Koh Kong. During our examination of the collection we selected a representative sample of 88 pieces of ceramics. Among the recovered material we found two pieces of lacquered covered box. While the designs on the lacquered surfaces were quite faded, the basketry core was in perfect condition. The radiocarbon dating was done by Nancy Beavan and its calibrated date ranges between 1428 and 1482 AD (95% probability) (Beavan et al., 2012b). The preliminary analysis of ceramics indicates that they could be derived from two sources of ceramics kiln sites: Mae Nam Noi kilns or Bang Rachan kilns in Singburi province and Si Satchanalai kilns in Sukhothai province, Thailand. Furthermore, the same type of storage jars with four lug handles has been found in the Cardamom Mountain, in Cambodia, where they have been used for burials. In this presentation I will discuss the preliminary analysis of the material and the different ways in which the site is connected to maritime trade routes in the gulf of Thailand and mainland Southeast Asia.

### **Collection of Ceramics from Shipwreck near Koh Sdach Island**

***Discovery of Ship sunk near Koh Sdach Island*** so far only one shipwreck has been located in Cambodia. This ship sank near Koh Sdach Island. The main cargo was of Thai ceramic production and various artifacts. According to local villagers some of ceramics and valuable objects were looted though the extent of the looting has not been quantified. Additional researches of underwater archaeology suggest that there may be around 15 shipwrecks according to local people in Kompot, Sihanouk village, Kep and Koh Kong province (UNESCO, 2011), but no evidence of their location has been found yet, further work will be done in the future lead by UNSECO in Cambodia and Department of Underwater Archaeology under Ministry of Culture and Fine Arts. According to initial reports, the estimated ship dimension is 30 m long and 8 m wide (Chuch Phoeurn, 2006). The location of the shipwreck is between the mainland and Koh Sdach Island. The popular name of the closest harbor is the “*Japanese Port*”. This may indicate evidence of maritime trade around area near Koh Sdach Island between Cambodia and Japan.

### ***Transportation and Storage***

Ceramics, boards of ship, ivories, ingots, one small canon, bamboo lacquer cover boxes, and various artifacts were moved and lifted from the ship by Russian divers. At first, all the collection was stored in a Russian ship, but after the salvage operations ended, the collection was moved and stored in a room that belonged to H.E. Ly Yong Phat, who extended funding support for the operation. Cambodian Royal Government has no funds to lift the shipwreck, an operation that was estimated to cost around one million US dollars. Consequently, the Ministry of Culture and Fine Arts, and National Museum in Phnom Penh proceeded to make an inventory of the ceramics and various artifacts. These were labeled as “KK.2006.0001”, abbreviation of KK “Koh Kong”. In the project I am currently working on, there are plans to build storage, cabinets, and carry out ceramics conservation such as desalination of soluble salt, assembling of broken ceramics, writing the number in correct place, make description, photography for database, etc. We will classify the ceramics in groups of large storage jars, medium storage jars, small storage jars, cooking pots, water jars, bottles, stoves, motors, basins, and so on.

### ***Ceramics Conservation***

We are carrying out technical methods of ceramic conservation for conservation problems such as waterlogged ceramics in salt water, flaking glaze, powdery clay of earthenware, cracking lines and broken in pieces, problem of storage, numbering in the wrong place, and dirty.

- Technical desalination: soak ceramics in fresh water for 24 hours, or three days, or one week. Test the salt in the water carried out by Conductivity Meter that will indicate its scale microsum ( $\mu$ ). Soak it in water time and again until measurement of soluble salt to degrees down around 100  $\mu$ . This process will stop the clay turn powdery and prevent further cracks in the ceramics.
- Cleaning dirt and shells: at this point, we must learn how to work out a problem of pot stains dirt and shells attached with the ceramics. We can remove some part of shells attach on pot at any area is occurred the deteriorative issue and look conspicuously, we keep in mind that shell remains is on pot could help us to

identify evidence of source where pots found. We can apply sponge, dental brushes, bamboo stick, and scalpel to clean the ceramics.

- Consolidation of flaking glaze: adhesive Acryloid B-72 and B-48 dissolve in pure acetone about 5-10 percent to drop on the glaze flaking with painting brush for three or four times. Carrying out this method can help glaze strongly. Normally, the problem of glaze flaking also occurs with soluble salt which thins the glaze and cracks the glaze is getting weak and then it flicks off.
- Consolidation of powdery clay: we can apply consolidation as glaze flaking, but this method could make clay to gain a dark color. In any case, desalination of salt may help pot clay in good condition. We know this problem often occurs with low fired pots.
- Assembling of pots: use adhesive Acryloid B-72 and B-48 in pure acetone, these types of adhesive is adopted for the climate in Cambodia, the glass transition temperature change is higher than 40<sup>0</sup>C. Before joining shards, we must consolidate the edge of shards three to four times, which strengthens the edge and makes it safer when we press it together. Apply adhesive on one edge of shard and press both shards together, and then pull it to see adhesive to fill in completed hole.
- Previous numbering was in the wrong place and also the size of the letter used on small objects was too big. We will remove and number at the right place. Normally, when numbering the objects we must think about where we should write. We make a lined coat and remember not to write direct on pots since ink stains on the pot are difficult to clean. The technical method used for numbering on the pots, is by making a coat with thick liquid of adhesive Acryloid B-72 and then we write the number on the coat, last point, we cover on top with thick liquid adhesive Acryloid B-67, this method, it can protect from scratching of numbering. As for, large jars can write number at low part of body and high from base 5 cm, make layer or coat with Acryloid B-72, size of letter should be 1 cm high. Medium size of storage jars and small jars must number smaller and smaller. Furthermore, cooking pots, water jars, Kendi, basins and various objects should number at a side of flat base in a section that will not be suffering friction from the floor, board

and storage compartment. We must make sure this area is not scratched when we move object.

- Ceramics storage: It is really important for management of artifact collection in Museum and Gallery. All of the ceramics derived from the Koh Sdach shipwreck are currently not in a good condition of storage, as we can see from the pile of ceramics and fragments (Fig. 6). Examination of ceramics indicates that many pots were recently broken in pieces, scratched lines of the clay and glaze, and chipped the edge of the shard. This happened due to weight compression from material stored on top. In my project, this year I am working on complete ceramics and I am planning on moving them to the Department of Culture and Fine Arts. I have some funds allocated to build the storage in order to store ceramics on shelf.

## **Conclusion**

The Koh Sdach shipwreck was transporting cargo following a coastal route but never managed to reach its destination, as it sunk off the coast of Cambodia and currently lies underwater at 32 m of depth. Various researchers have thought this was a Chinese junk, but this assertion requires further study of the planks. A proof of iron melting wrap around ceramics appears to indicate that the ship may have been burnt due to an act of piracy or by accident. This ship was found on February 2016 by fisherman. Ceramics and various archaeological artifacts were brought up from the sea by Russian divers supported by H. E. Ly Yong Phat. Most of the storage jars originated from Mae Nam Noi kilns in Thailand and Radiocarbon date suggest 1428-82 CE old. Furthermore, we found some Si Satchanalai celadon plates, Chinese blue and white porcelain plates, low fired wares such as cooking pots, water jars, stoves, kendis and basins. The discovery of Mae Nam Noi storage jars which highland people used for funerary practices in valley or on the hills of Cardamom Mountain in Thma Bang and Sre Ambel districts, Koh Kong province indicate that the trade routes taken by these materials was mainly coastal. The jar burial sites in the Cardamom Mountains show the common use of Mae Nam Noi Jars that have had the necks of the jars knocked off, and a hole was drilled on the bottom. These jars were used to store human bones in a secondary deposition. The jars were then placed in a natural rock ledge along the range of Cardamom Mountain (Beavan,

2012a). We also found the celadon plates in this context; therefore it is possible that they were used for food offering during ceremonies. In my project have planned for three years of ceramics conservation and management, at first year, I am going to focus on earthenware which researchers have been focused on the stoneware in Southeast Asia; At second points, I am going to focus on the stoneware and third point, I am going to conserve all of broken ceramics in pieces. We are going to build storage for ceramics from the shipwreck and management. Therefore, we expect cultural heritage treasures in Cambodia, were derived from the shipwreck are going to conserved and preserved in good condition. In the near future, we hope UNESCO and other organization will help to build the museum for collection found in Koh Kong province.

## Catalogue

Notification of ceramics is classified into 12 functions such as storage jars, bottles, jarlets, basins, Kendis, celadon bowls, blue and white Chinese porcelains, cooking pots, water jars, lids of cooking pots and water jars, stoves, and mortars. Additional point, they have slightly different dimensions and decoration. Radiocarbon dating on bamboo box with lacquer has provided the date between 1428 and 1482 CE.



Fig. 1

**1. Storage Jar** (Fig. 1) with thick four lug handles, black and green glaze in the lower part of body, vertical neck, profile lip and flat base. Many jars found having dimension of H: 50-66 cm, Diam: 40-45 cm.



Fig. 2

**2. Jarlets** (Fig. 2) with two handles and green glaze, reddish tan clay. These types of jarlet were produced in Si Satchanalai kiln around 15th -16th centuries. Jarlet was formed shape as gourd, they perhaps use for liquid container. Normal glaze is green glaze that we call Celadon ware to focus on clay object with green color, but soluble salt is made flake and changed color of glaze. Measurements: H: 10.5 cm, Diam: 7cm; and Cat: 13, H: 7 cm, Diam: 8cm



Fig. 3

**3. Si Satchanalai Celadon Bowls** (Fig. 3) Some celadon bowls found in the pile of ceramics which stylistic data of celadon; they were produced in the late period of Si Satchanalai. Bowl Fig. 3: H: 6-7.5 cm, Diam: 23-25 cm



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8

**4. Blue and White Porcelain Bowls** (Figs. 4-5) with blue cloud design at exterior and Chinese letter “Fu” at center of bowl interior, ideogram for happiness. Dimension H: 7 cm, Diam: 14.5 cm; Bowl Fig. 5 with cobalt blue glaze at exterior and Chinese letter “Fu” but different style of writing than Fig. 4 Dimension H: 4.5 cm, Diam: 9.5 cm

**5. Cooking Pots** (Fig. 6) has an ellipsoid shape, short neck, large mouth, and round base, impress design on entire body. This type of traditional cooking pot was made by paddle and anvil, it appears like Thai production and many storage jars of various sizes were exported. There are 30 complete pots we counted and some of them were broken. Dimension of cooking pot Fig. 6 H: 31 cm, Diam: 22 cm

**6. Water Jars** (Figs. 7-8) Based on the style of tradition of water jars in Cambodia, we call this type of pots “Water Jar” though it does not only refer to water container but it could also be used for various purposes. In this shipwreck, water jars are more in number than cooking pots. Many water jars are of the same dimension: H: 16-17cm, Diam: 20-22 cm; there is only a large water jar, dimension: H: 29.5 cm, Diam: 33 cm. Decoration of pots indicates impression of paddle pattern such as illustration of incised lines on the wood pattern Fig. 7; and pattern of X with fish eggs at upper part of water jar Fig. 8.





Fig. 9

**7. Group of lids** (Figs. 9-10) with dome shape, handle at center, they may be lids for the water jars. Dimension H: 2-4 cm, Diam: 9 – 15 cm; Four lids with dome shape and unglazed cylindrical shape, Thai earthenware also found at Rang Kwein ceramics (Brown, 2009), H: 7-11cm, Diam: 23-33 cm



Fig. 10



Fig. 11

**8. Stove and Mortar** (Fig. 11) there are several mortars amongst the items recovered from the ship; it seems under fired clay, this type of object is used for pounding hard foods for cooking. Mortar has ellipsoid shape, stamp foot, and reddish clay. The mortar has the following dimensions H: 10 cm, Diam: 17cm. A stove was also found amongst the material recovered.

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