



Knobbed Ware from Archaeological Sites in Thailand: An evidence of Early Exchange between South Asia and Southeast Asia

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Abstract

Knobbed ware are a type of vessel with a raised-knob at the base which were found among the artefacts in several archaeological sites in the Indian subcontinent and Southeast Asia. It is perceived that they are evidence of interactions between the two regions during the mid first millennium BCE. A number of knobbed wares, some of which were copper-alloy vessels; others earthenwares were documented at a few archaeological sites in western, central and southern Thailand, which is a part of South and Southeast Asian early exchange network.

This paper focuses on stylistic attributes and materials of the knobbed wares found in these regions. The location as well as physical and cultural characteristics of the archaeological sites are examined to provide some insights into the nature of distribution and exchange. A comparison of the knobbed wares found in Thailand and ones found in the Indian subcontinent and Southeast Asia is presented to determine whether the stylistic attributes could help identify the differences between imported vessels and locally-made ones, and if they were imported, where their origins were. The function of this type of vessel will also be discussed.

Keywords

Knobbed ware, Early exchange, Thailand, South Asia and Southeast Asia

Introduction

Knobbed ware has been well-recognized in the Southeast Asian archaeological domain especially in research concerning early exchange between South and Southeast Asia. They have been found with other foreign vessels; e.g. "Greek-Roman" and "Indian" wares, discovered from ancient entrepôts not only in Thailand but in other countries of Southeast Asia as well. These vessels are either imported or influenced by such foreign vessels as rouletted ware, amphora and Northern Black Polished Ware, etc. Like those vessels, knobbed ware have distinct characteristics worthy of a careful study about its origin and functions, but to date only a few studies have been done on the subject.

The vessel is called knobbed ware because at the centre of the interior surface of the base protrudes a knob, which is usually encircled by a series of concentric grooves or incisions.

Reports of knobbed-base vessels are found in numbers at archaeological sites in South Asia and Southeast Asia. In South Asia, besides the discovery of knobbed wares at Taxila, which is probably known as the oldest site for this type of ware, they were unearthed from several sites including such important entrepôts as Harinarayanapur in Western Bengal, Sisupalgarh and Manikapatna in Odhisa (Orissa) and Wari-Bateshwar in Bangladesh. In Southeast Asia, they have been found in various archaeological sites in western, central and southern Thailand. In Cambodia, they have been reported from Kampong Cham Province, eastern Cambodia (Reinecker et al, 2009, pp.142-143); and in Vietnam, at Than Hua in central Vietnam (Janse, 1962).

This type of vessel is concentrated in the late prehistoric to protohistoric period. The time range of this ware is in the mid first millennium BCE. By its special stylistic attributes, its use is still unclear. It is suggested that this type of vessel is associated with ritual or funerary purposes (Glover, 1990; 1996), but that will be discussed further in this article.

Knobbed Ware in Thailand

Knobbed ware were discovered in late prehistoric and protohistoric sites in western, central and southern Thailand. They were made from different materials such as copper-alloy and ceramic. Most of them were found in pieces.

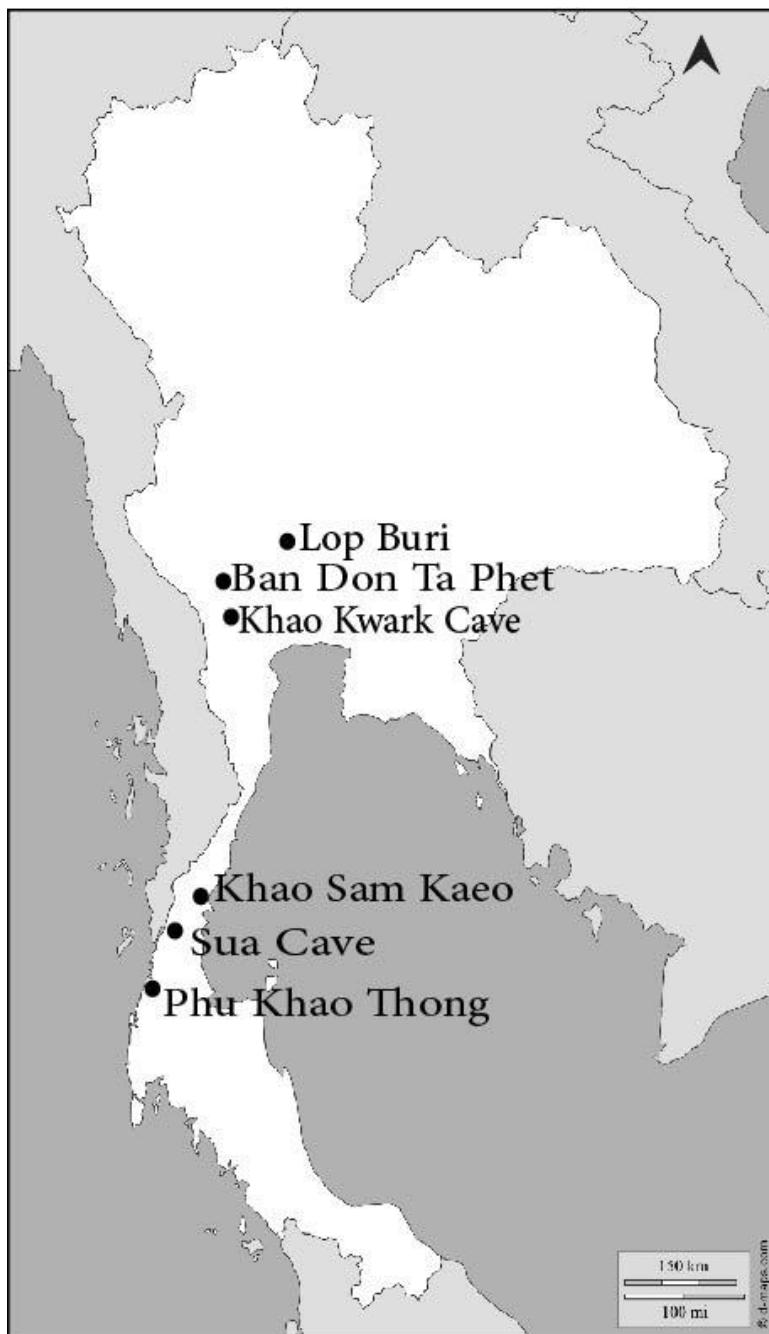


Figure 1 Distribution of Knobbed ware in Thailand

Western Thailand

Ban Don Ta Phet, Kanchanaburi Province

Ban Don Ta Phet is a village in Phanom Thuan District, Kanchanaburi Province. The site, located on a mound at the edge of Quaternary alluvial deposits, has been excavated since 1975 by the Thai Fine Arts Department and the Institute of Archaeology, University College London. In the past, the site could be accessed from a river, and it was close enough to the western tin belt of Thailand that raw material for the metal works could be fairly easy to obtain.

Ban Don Ta Phet is the iron-age burial site dating back to the 4th century BCE (Glover & Bellina, 2011, p. 24). Many artefacts found here provide evidence of trade relations with India, Vietnam, and the Philippines. Such artefacts included flat hexagonal shaped carnelians, small stone figurines of lions and tigers, and various metallic vessels (Glover & Bellina, 2011).

According to the records of the 1980-81 and 1984-85 field seasons at Ban Don Ta Phet, 20 pieces of copper-alloy knobbed-base bowls were recovered at the site. The majority of them were flat base vessels with near vertical sides. Each vessel had a central boss either in conical or faceted form which may be cast-on to base, or separately riveted (Glover, 1990, p.156) (Figure 2). The result of compositional analysis revealed that these bowls contain tin in high percentage (Rajpitak & Seely, 1979; Glover & Bennett, 2012).

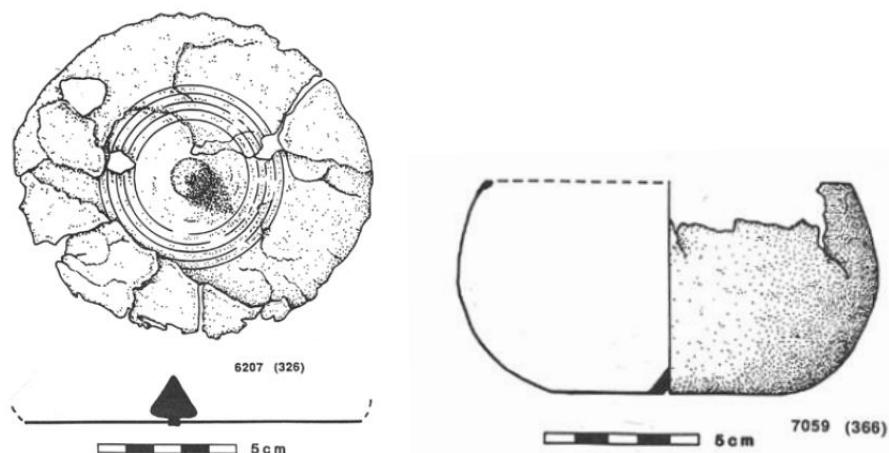


Figure 2 Knobbed Ware from Ban Don Ta Phet. (Glover, 1990)

Khao Kwark Cave, Ratchaburi Province

A fragment of a copper-alloy vessel with a conical knob at the inner centre surrounded by concentric rings was accidentally found with some ancient iron tools and other artefacts in Khao Kwark cave, Photharam District, Ratchaburi Province (Figure 3). The site is located in Mae Klong valley which is one of the main areas in western Thailand that has been occupied since the Neolithic period. In Photharam and adjacent locality, some imported artefacts were found including a Dong Son drum and high tin bronze vessels. Furthermore, tin as well as other mineral resources were discovered in this area (Lualami, 1990).



Figure 3 A fragment of a copper-alloy knobbed vessel from Khao Kwark.
(photograph by Surin Lualami, 1990, p. 62)

Central Thailand

Lop Buri Province

A small copper-alloy knobbed vessel (Figure 4) was found in Lop Buri by a local who donated it to the museum. Though its context is unknown, it is highly possible that it was from one of the late prehistoric sites around Pong Manao. It has since been exhibited at Pong Manao community museum in Phatthanankom District, Lop Buri Province.



Figure 4 A small copper-alloy knobbed vessel in the Pong Manao community museum.
(photograph by Praon Silapanth)

Southern Thailand

In southern Thailand, knobbed wares were unearthed from a number of the late prehistoric-protohistoric sites in Chumphon Province by the eastern coast of the peninsula, as well as in Ranong Province on the Andaman coast.

Khao Sam Kaeo, Chumphon Province

Khao Sam Khao is situated in Muang District, Chumphon Province. It comprises of 4 hills bordering the Tha Taphao River on the west. Its distance from the recent coast (Phanang Tak Bay, Gulf of Thailand) is around 5 km. to the east. The archaeological surveys and excavations had yielded evidence showing that Khao Sam Kaeo was not only a settlement but also a trading and craft manufacturing centre that played a pivotal role in the early exchanges between India, Southeast Asia and the South China Sea; particularly during 400-200 BCE, its most active period. It is possible that the area was occupied until later periods. The artefacts discovered at the site included rouletted ware, stamp wares, semi-precious stones such as carnelian and agate beads, glass beads, bronze drums, lingling-o and bicephalous earrings, fragments of a Han mirror, seals with Brahmi scripts, etc. (Bellina & Silapanth, 2006; Bellina-Pryce & Silapanth, 2008).

Among the exotic artefacts found at Khao Sam Kaeo, several pieces of knobbed wares were discovered. Two pieces of earthen knobbed wares were unearthed at Hill 4, one of them was a surface find, the other one was from the excavation.

Bouvet's ceramic study identified these two sherds as "KSK-Fine wares 1 group" which was characterized by very fine and homogenous paste in red and/or black, with tiny specks of mica inclusion (Bouvet, 2011, pp. 49, 51). One of them was a fragment of flat-based vessel with a central knob surrounded by four rows of incised concentric circles that suggested the use of a rotary movement. The other sherd is a foot-ring vessel with conical central knob but not surrounded by any circles (Bouvet, 2011, pp. 53, 56) (Figure 5)

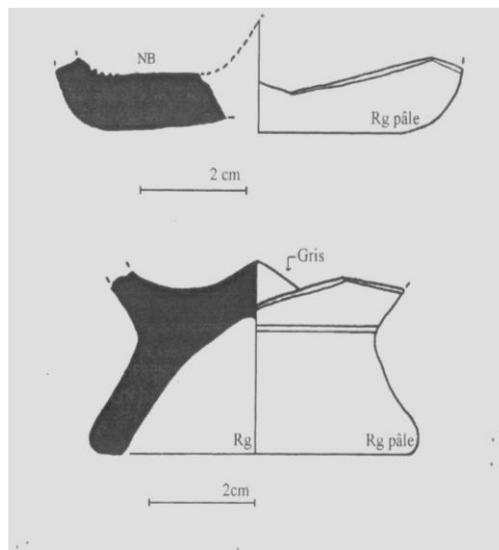


Figure 5 Knobbed pottery sherds from Khao Sam Kaeo (Bouvet, 2011, p. 57).

Another fragment of a metallic knobbed vessel was discovered from the survey at the foot of Hill 2 of Khao Sam Kaeo. A chemical composition analysis conducted by Pryce and his team (Pryce, et al, 2008) revealed that it was a high-tin bronze bowl. Evidence of casting before hot working was also found (Murillo-Barroso et al, 2010). Its morphology can be compared with those that were unearthed in the western part of Thailand (Pryce et al, 2008) (Figure 6).

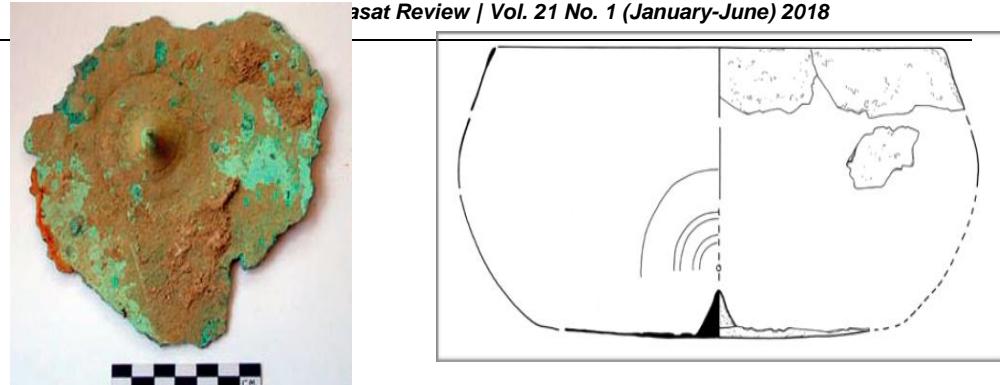


Figure 6 Fragments of copper-alloy knobbed vessel from Khao Sam Kaeo.
(photograph by B. Bellina from Glover & Bennett, 2012 (left); drawing from Pryce et al., 2008, p.302 (right).

Furthermore, a knobbed bronze bowl was found in the Tha Taphao river near Khao Sam Khaeo archaeological site by a villager. According to Glover and Jahan (2014), the decoration on the surface of the bowl can be compared with the early northwestern Indian motif. It probably belongs to the Sunga or Satavahana period.

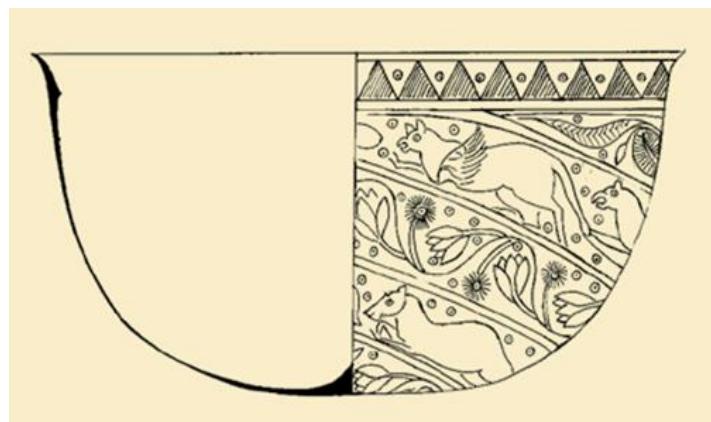


Figure 7 The knobbed bronze bowl from the Tha Taphao river near the Khao Sam Kaeo archaeological site (Glover & Jahan, 2014).

A few more earthen knobbed wares were also found in Khao Tha Lu in Sawi District, Chumphon Province. They were documented and kept in a private collection (Praphid Phongmas, pers.comm.).

Sua Cave, Ranong Province

Sua Cave is a large cave in a limestone hill located in La Un District, Ranong Province. It should be noted that there have been no records nor information of any other artefacts found in this cave; however, a number of sherds, semi-precious stone beads, bones, polished stone tools, etc. were discovered by the locals in other caves in this area. These sites were approximately dated to the late prehistoric-protohistoric period.

Knobbed pottery was discovered inside the cave by a villager. Later he donated it to the Fine Arts Department. It is half covered by natural calcareous material from the cave. It is a thin, fine paste bowl with a central conical knob at the interior of the base. It has everted, straight rim with ring foot base. The pottery's surface is burnished (Figure 8).

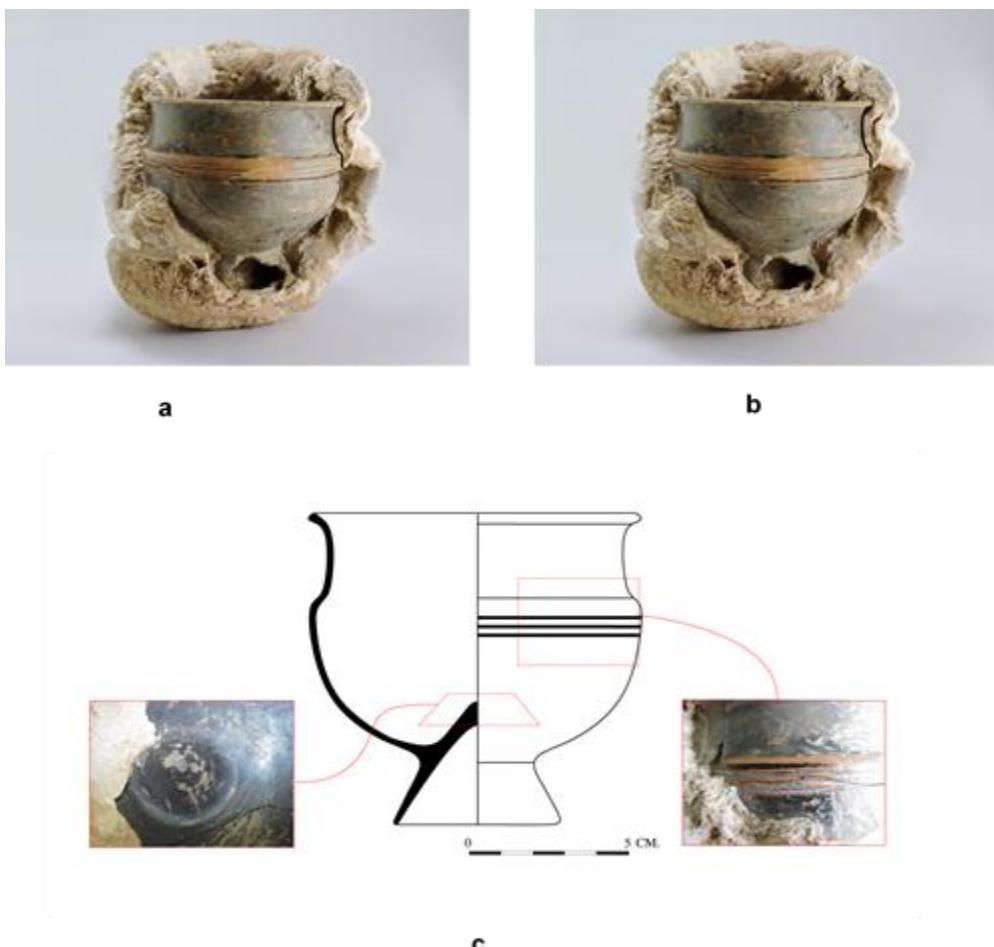


Figure 8 The knobbed pottery from Sua Cave
(photos (a) and (b) courtesy of the National Museum, Thalang; photo and drawing (c)
courtesy of Captain Boonyarit Chaisuwan).

Phu Khao Thong, Ranong Province

Phu Khao Thong is situated in Suk Samran District, Ranong Province. It is approximately 2 km. from the Andaman coast. Many artefacts from India and the Mediterranean were uncovered at this site, e.g. rouletted ware, agate and carnelian intaglios, granulated gold beads, a mosaic glass bead, a seal with Brahmi characters, sherds inscribed with Brahmi and Tamil-Brahmi characters, etc. These findings indicated that the site was an important trading port in Southeast Asia during the protohistoric period, dating 1,200-2,240 BP. It was one of the bead making sites in southern Thailand as well (Chaisuwan, 2016; Borell et al, 2014).

A few knobbed pottery sherds were also found at Phu Khao Thong (Figure 9, 10). They are surface finds. One of them was a fragment of a foot-ring pottery, others were fragments of a flat-based pottery. The colour of the outer surface was red, the interior surface black. Their central knobs were of conical shape. Bouvet classified these sherds as belonged to the Indian Fine ware group I (Bouvet, 2011, p. 59).

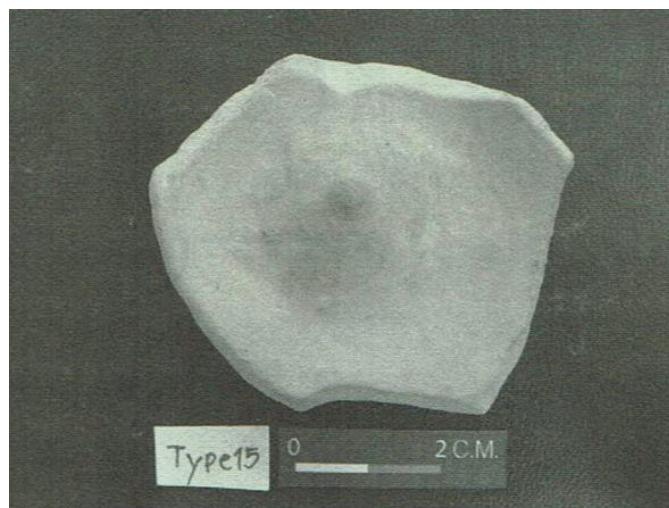


Figure 9 A piece of knobbed ware sherd discovered at Phu Khao Thong
(Chaisuwan, 2016, p.116).

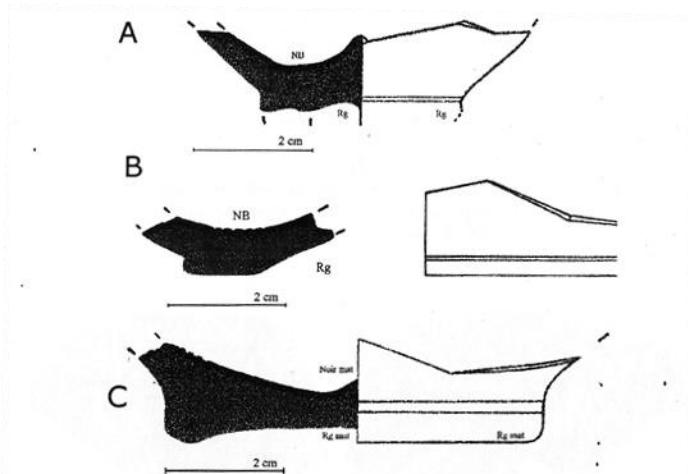


Figure 10 Knobbed ware sherds from Phu Khao Thong (Bouvet, 2011, p.59).

From the data about knobbed wares unearthed in Thailand, it can be concluded that the knobbed based vessels found in western and central Thailand are metallic, while those found in southern Thailand are ceramic and metallic. In terms of the quantity, the metallic (copper-alloy) vessels are more common than the ceramic (earthenware) ones. According to the current available information, the knobbed vessels found in western and central Thailand are copper-alloy or high-tin bronze. They were found within the late prehistoric-protohistoric sites. At Ban Don Ta Phet, for instance, they were grave goods, and the one found in Lop Buri, central Thailand, might be in the same context (grave goods in a burial site). The function of this type of vessel, however, is still unknown.

Most of the metallic knobbed vessels in Thailand are similarly thin and brittle. Compositional analysis of knobbed vessels from Ban Don Ta Phet and Khao Sam Kaeo revealed that they were high-tin bronze (Rajpitak & Seely, 1979; Glover & Bennett, 2012; Pryce et al, 2008). It is possible that other vessels from other sites in Thailand might contain tin in high percentage as well, but further study is needed. According to the result of chemical analysis of copper-alloy samples, some of them were produced locally (Murillo-Barroso et al, 2010).

In terms of their morphology, most of the bronze knobbed vessels have flat or round bases in the shape of a bowl or canister, with conical or faceted knobs. On the other hand, most ceramic knobbed wares have flat or ring-foot bases with conical knobs.

It can be noted that Southeast Asian knobbed wares in general, provide strong archaeological evidence which indicates there was an exchange route between the Indian subcontinent and Southeast Asia during the late prehistoric and protohistoric period. This is because they were found in several archaeological sites not only in Thailand but also in other

Southeast Asian countries, such as Vietnam (Janse, 1962) and Cambodia (Reinecke et al, 2009). In Vietnam, some metal knobbed vessels were found in burial sites at Than-hoa, central Vietnam, in the context of grave goods dating around 2000 years ago (Janse, 1962). At a burial site near Memot, Kampong Cham Province, eastern Cambodia, a bronze object with a knob on the inside base was found. It might be a flat dish knobbed vessel or a decorative disc (Reinecke et al, 2009, pp. 142-143).

Some of these knobbed wares were usually found in association with other imported artefacts especially rouletted ware, Northern Black Polished Wares, semi-precious stone and glass ornaments, etc. (later, some of them were imitated locally). It can thus be assumed that some of the knobbed vessels may be imported as well. The study of their origins and distribution patterns will provide more insights into the exchange networks between South Asia and Southeast Asia.

Knobbed Ware in the Indian Subcontinent

Knobbed vessel discoveries have been reported from several archaeological sites in northwestern Pakistan, northern Andhra Pradesh, west Bengal, Assam, Odisha (Orissa), Bangladesh and Sri Lanka. They were concentrated in the early historic period. Examples of these archaeological sites are as follows:

Northwestern Pakistan

Taxila is an interesting site in which knobbed ware was found. The site was in Gandhara territory in northwestern Pakistan, dated back around the Buddhist era. It had been a settlement of many groups of people, such as Achaemenids in 6th century BCE., and Greek in 4th century BCE. Knobbed vessels found at Taxila were made from ceramic, stone as well as metal. Most of them were recorded and published by Sir John Marshall, who suggested that this type of vessel was related to *philae mesomphalos*, a type of Greek vessel (Marshall, 1975, pp. 157, 612).

At Sirkap in Taxila, a knobbed pottery of fine red clay with darker red wash was discovered. It is a flat dish with concave sides, small everted lip, and raised boss in the centre of its base. Marshall (1975, p. 45) classified this pottery as Class XVI, Type b (no. 109). It belongs to stratum II, Saka-Parthian period (around early centuries CE).

Also found at Taxila were a few stone knobbed wares made from schist and granite. At least two grey micaceous schist knobbed dishes were unearthed at Sirkap. The one that was found at the west side of the main street dated back to the Greek period (stratum V, around the 3rd-4th centuries BCE). The others were from the east side of the main street, dating back to the Saka-Parthian period (stratum II, around early centuries CE). (Marshall's classification no. 39 and 40, Class VII). At the time of discovery they were broken, without a

rim or an upper part. The knob at the centre of the base was surrounded by concentric circles (Marshall, 1975).

A granite circular knobbed vessel was discovered from a religious monument at Taxila though the exact location where it was found has yet to be determined. It was given to the British Museum by Cunningham. It is a flat-bottom dish with a conical knob surrounded by concentric rings. The lip is sloping inward. It is said that a small rock crystal goose (or Hamsa) was found with this vessel as well as a gold leaf scroll; thus, it is known as a reliquary (British Museum, n.d.; Glover, 1990) or it may be used as a lid for a vessel enshrined in a reliquary chamber in a Buddhist monument (Ray, 1994, p. 96) (Figure 11).



Figure 11 The granite circular knobbed vessel with rock crystal goose from Taxila in the British Museum (British Museum, n.d.).

Based on Marshall's report (1975), the silver knobbed vessel was recovered from Sirkap inside the house no. 2D, which was located at the back of a Buddhist monastery with an apsidal plan. Also found inside the house, below the floor level and attached to the monastery's wall, were a hoard of silver and gold artefacts, including gold ornaments and silver wares. The location of the finds indicate that these artefacts might have been hidden by the owner when Kushan attacked the town. The shape of silver knobbed vessel found from this hoard was flat and round, about 22 cm. in diameter. At the centre of the vessel's interior, was a conical knob with a small button on top. This conical knob was surrounded by 6 circumference lines. The Kharosthi inscription in the vessel stated that this vessel belonged to "Mimjukrita." It also stated the value (price) of the vessel. Marshall suggested that this vessel could be compared with the Greek vessels known as *phiale mesomphalos* that was popular in the 3rd-2nd centuries BCE (Marshall, 1975, p.157). Two more silver vessels, with 31.25 cm. and 32.38 cm. in diameter respectively, were found in the settlement area (Block G').

The copper knobbed vessel was reported from Taxila as well (Marshall, 1975). It was a flat dish with conical central boss topped with a small button, similar to the knob of the silver dish (Figure 14), and a bronze knobbed vessel from Taxila is also held in the British Museum collection (Glover & Bennett, 2012).

Odisha (Orissa), India

Knobbed ware were unearthed from Sisupalgarh in Odisha (Orissa), an important trading port that flourished in early historical periods. The fragments of knobbed vessels were found in association with rouletted ware and Northern Black Polished Ware (Lal, 1949 cited in Ray, 1994, p.33).

In addition, knobbed ware were also discovered at Manikpatna, another archaeological site in Odisha on the mouth of Satapada ghat of Chilika Lake. The artefacts from this site indicated that there was an exchange/trade network between India and other regions including Southeast Asia from the early historical period to 18th century CE (Tripati et al., 2015, p. 219).

West Bengal, India

An earthen knobbed vessel fragment was unearthed from Harinarayanapur. Its characteristics were similar to those found at Wari-Bateshwar in Bangladesh (Ray, 1994).

Central Bangladesh

Wari-Bateshwar are two adjacent villages in Narsingdi District in Central Bangladesh. They used to be important trading ports between South Asia and Southeast Asia (circa 3rd century BCE- 3rd century CE). High-tin knobbed vessels were discovered at this site in association with other potteries such as rouletted ware, Northern Black Polished ware, and earthen knobbed ware in coarse, grey fabric. The copper-tin alloy knobbed ware at Wari-Bateshwar contained more than 20% tin, similar to those found at Ban Don Ta Phet. A piece of grey knobbed pottery sherd was discovered at this site as well (Jahan, 2010).

Discussion and Conclusion

Origin of form and function

The information about knobbed ware found in Thailand shows clearly its significance as one of the foreign objects representing an exchange with India. These types of vessels were found in several sites on the Indian subcontinent, especially the port sites or entrepôt. Knobbed vessels recovered from the excavations at Taxila were reported by Marshall (1975) as similar to *Phiale Mesompholos*, a type of Greek vessel.

The phrase *Phiale Mesomphalos* derives from *phiale* (or *patera* in Roman), which was a kind of vessel + *mes*, or “middle” + *omphalos*, or “navel.” The phrase has been used to call a vessel with a boss at the centre. In Greek mythology, the *omphalos* or navel was related to the centre of the world or the Earth’s navel which was ascertained by Zeus, who, after releasing two eagles at the outermost points of the universe, marking the place where they met (Stafford, 2004).

In terms of a symbol, Cooper (1978, p.122) comments that “*omphalos* is a symbol of the earth and all birth, represented often as a mountain or island rising from the water of chaos, as a meeting place of heaven and earth. It is also the dwelling place of the Gods.”

According to Greek mythology, *omphalos* was placed in the sanctum of Apollo’s temple. It is exhibited at the Museum of Delphi (Stafford, 2004).

Phiale Mesomphalos was used for libation, an ancient Greek ritual dating back to the Bronze Age or protohistoric period. In this ritual, liquid such as wine, water, honey, milk or oil was donated to the deities, demons or the spirits of deceased ancestors. The libation could be performed by pouring liquid on any object representing a religious symbol such as an altar, or pouring liquid directly on the earth. When donating to a deity, one might pour the liquid from another type of vessel to the *phiale* held by the deity.

As such, we can correlate the knobbed ware found at Taxila and other archaeological sites with the *phiale mesomphalos* in Greek culture, which was well known around the 4th Century BCE., though there are some differences in terms of the knob’s shape: the central knob of Greek vessel appears in a bulging shape while the knobs of Taxila’s vessels are usually in a conical form with (or without) a tiny knob on the top of the cone.

The Knobbed vessel was probably introduced in Taxila as a sacred utensil for the ritual. So far, there has been no evidence of knobbed vessels with the exact same characteristics as a genuine *phiale mesomphalos* of Greek in the Indian subcontinent but it is feasible that the concept of centre of the universe and the holiness was still implied in Buddhist settlements there, despite the changes in the vessel’s style and function.

The granite knobbed ware from Taxila was recorded in the British Museum’s catalog as “reliquary or dish” (Figure 12). As mentioned earlier, it was found in the centre of the foundation of a religious monument. This vessel was discovered in association with a rock-crystal hamsa or goose which was said to be placed on the central cone of the bowl. An inscribed piece of a gold leaf, 3 inches long, was also found. The inscription mentioned the name of a devotee (Sira) who “... depositing a relic of the Lord in the hamsa of her mother, the hamsa of her father. Might it become its place when a corporeal birth comes”

(Glover, 1990, p. 39; British Museum, n.d.). Thus, the inscription may represent the concept of the centre of the universe which is the origin of things.

If these objects were found to be in the same set which comprised of knobbed ware, a rock-crystal goose figurine (symbol of heaven) and the inscriptions were as mentioned above, might they represent the relation between the Greek concept of *omphalos* or navel of the world and the concept of the centre of the universe that appeared at Taxila? Is this a transmission point from Greek culture passing through Indian (Buddhist) culture? Is it possible that the two hamsas mentioned in the inscription were related to the two eagles of Zeus?

It should be noted that a tradition of placing Buddha Relics in a rock-crystal casket was also found in Thailand, but in a later period. A bird-like shape, rock-crystal casket containing a few relics of the Buddha was found at Wat Si Khong, Hod District, Chiang Mai Province, dated back to the late 15th – early 16th century CE (Fine Arts Department, 2017).

Knobbed Ware in Thailand

Knobbed ware found in central, western and southern parts of Thailand belonged to the late prehistoric-protohistoric period, most of which were made from copper-alloy. In central and western Thailand in particular, these knobbed wares were found in graves. Thus, the function of knobbed ware discovered there should not be concerned with Buddhist rituals (although the person who brought them might be acquainted with their Buddhist context). Since Buddhism was not yet introduced in that area at that time, was it possible that these vessels were placed there only as prestige items, or, more than that, as a sacred object concerning the concept of (re)birth as believed in Greek culture?

The shape and style of some high-tin bronze knobbed vessels from Ban Don Ta Phet and the copper-alloy knobbed bowl from Lop Buri are quite similar to the one from Taxila (though the knob in the middle is different). An analysis of bronze vessels from Ban Don Ta Phet and Khao Sam Kaeo reveals that these vessels contain a high percentage of tin (high-tin bronze) (Glover & Bennett, 2012). Some high-tin bronze bowls (not necessarily knobbed wares) are decorated in an Indian style. Thus, they might have been imported, not local products. Knobbed ware has also been included in foreign vessel types, yet another indication that it might be an imported ware. Since it reveals more sophisticated technique and decoration than the local wares, it is less likely that this type of vessel was produced by local craftsmen who were trained by Indians. The decorations on the metal alloy knobbed wares unearthed from southern Thailand, particularly a copper-alloy bowl from Khao Sam Kaeo, had been associated with the northwestern Indian motif (Glover & Jahan, 2014). However, some of them were produced locally according to compositional analyses (Murillo-Barroso et al, 2010).

Both ceramic as well as copper-alloy knobbed wares found from the archaeological sites in southern Thailand were not grave goods from burial sites but belonged to the trading port or entrepôt located at both side of the peninsula (Phu Khao Thong and Sua Cave on the western coast and Khao Sam Kaeo on the eastern coast). At Khao Sam Kaeo, copper-alloy as well as ceramic knobbed ware were unearthed. However, the fragment of high-tin bronze knobbed vessel which was discovered at the foot of Hill 2 probably belonged to the cemetery area of the Khao Sam Kaeo site. The only fine paste pottery in good condition was found at Sua Cave -- a foot-ring vessel with an everted rim, indicating that its function was probably different from a flat dish or a bowl.

Research on knobbed ware in Thailand reveals that most of the knobbed wares from central and western Thailand are copper-alloy and high-tin bronze. They were found in the context of graves in the late prehistoric – protohistoric period (around 4th Century BCE – 4th Century CE). Therefore, the function of these knobbed vessels might not relate to Buddhist beliefs because it was still a prehistoric society.

Most of the knobbed vessels from southern Thailand were found at ancient entrepôts. Although the dates of these archaeological sites are contemporaneous with those sites in central and western Thailand; it seems that the sites in southern Thailand were more developed than the ones in western and central Thailand. It can be said that knobbed ware found in southern Thailand had more various materials and shapes, and, based on their styles, more decorative patterns and materials. They were also most likely imported. Since most of the knobbed ware from southern Thailand were not in the context of burial sites as grave goods, their functions might be different from those discovered in western and central Thailand. Though it is not clear whether they relate to Buddhism or not, the concept of sacredness of the vessels is probably still present.

In terms of the evolution of knobbed ware's function, it is believed that knobbed ware was used as a Buddhist ritual object in later periods. They might relate to the original concept of the centre of the universe symbolized by the central boss of the vessel. And they might relate to the (re)birth according to Bactrian Greek's belief. Then, it was transmitted to the Buddhist settlement at Taxila as reliquary that emphasized the sacredness of birth. When Buddhism was introduced in Southeast Asia, this concept of knobbed ware as the centre of the universe might have remained, making knobbed ware an important and sacred object.

It should be noted, however, that its morphology was adapted for more practical usage in Buddhist rituals and seen as a "holy water bowl" in the past. As a holy water bowl the vessel was used to make holy water; the central conical knob a candle holder. The use of the vessel in this way still exists in Thailand, though it is very rare. A bronze holy water bowl belonging to an artisan family of Ban Bu, the bronze-smith village in Bangkok is an example of a knobbed vessel use for this purpose. It was inherited from their ancestors since the late Ayutthaya period (around the 18th century CE) (Surapol Natapintu, personal communication).

According to the archaeological context, most knobbed wares were found in association with other Indian or Indian-related objects especially rouletted ware, Northern Black Polished Wares, semi-precious stones and glass ornaments, etc. These artefacts can be compared with those found from ancient entrepôts in northwestern Pakistan (Taxila), northern Andhra Pradesh, west Bengal, Assam, Odisha (Orissa), Bangladesh and Sri Lanka. Most of them can be dated around the mid first millennium BCE - the first century CE which the trade networks in the Indian subcontinent had flourished under the Maurya-Sunga dynasties (4th - 1st century BCE), followed by the Kushana-Gupta dynasties (1st- 3rd century CE). During that period of time, Taxila was one amongst the most important cities, it was a significant junction of trade between central Asia and India. Several types of artefacts were discovered at Taxila which revealed some links with Southeast Asian settlements such as Ban Don Ta Phet in western Thailand (Indrawooth, 2005, p. 200). But not only Taxila, there were also many archaeological sites in India that served as the production sites of goods such as the semi-precious stone ornaments manufacturing sites at Ujjian, Nasik, Cambay, Brahmaburi, etc. (Indrawooth, 2005, pp. 42-47). However, those artefacts may have been transported via the ancient inland trade routes to the coastal ports such as the ports at the mouth of Ganges river or Narmada river then across the Bay of Bengal to Southeast Asia (Indrawooth, 2005, pp. 34-35). However, further studies of the origin of South Asian artefacts found in Southeast Asia including knobbed ware are required.

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