Chapter 10

MARITIME TRADE FROM THE FOURTEENTH TO THE SEVENTEENTH CENTURY

Evidence from the Underwater Archaeological Sites in the Gulf of Siam

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Introduction

The catchword in today's transport field is *convenience*. Journeys to distant continents which might be thousands of miles away can be made within hours in aircraft that have been developed to achieve supersonic speed. However, the high cost of air freight discourages traders from using it to transport heavy and bulky cargo which is more economically moved by sea-faring vessels—a mode of transport which has been utilized by merchants for thousands of years. Ships can sail at much higher speeds and can carry tens of thousands of tons in this modern era, but they also continue to provide housing and office space for all of those who sail on them in much the same way that they have in the past. All the activities of daily life can still be pursued on board.

There is evidence to suggest that sea traders from afar were present in the river plain in central Thailand and along the coast of the Gulf of Siam down to the Malay Peninsula from the fourth or fifth century on. During the seventh to eleventh centuries, when human settlement became more common, with the Davaravati Kingdom controlling much of central Thailand and the Srivvijaya Kingdom's territory covering the

Malay Peninsula and the Indonesian Archipelago, evidence of maritime trade routes includes ceramics from China, glass and stone beads from India and Persia, and cult icons, all of which had been transported to the region by these maritime traders and introduced to the indigenous peoples. These items were found in abundance especially at settlements along the coasts such as U-Thong, Nakhonchaisri, Kubua in central Thailand and Cahiya, Nakhon Si Thammarat, Yarang (in Pattani), and Narathiwat in the south. Discoveries of these exotic goods have so far occurred on land and unfortunately no wreck site dating to those periods has yet been discovered in those areas.

During the twelfth and thirteenth centuries, Chinese merchants seemed to dominate the Southeast Asian market. There were many more junks traveling in Thai territorial waters and even penetrating deeper inland up the main waterways such as the Tha Chine river and the Mae Klong river. Chinese written records provide accounts of maritime traffic.

Many traders settled in the region and spread knowledge of ship building technology and sailing techniques to the local population. Later, these foreign traders became important for their roles as foreign affairs and international commodity officials. Chinese documents recorded that during the years 1289 and 1290 there was an ambassador from Suwannabhum presented at the court in Peking, and that in the next year, 1291, the Mongol court received the ambassador from the Sukhothai Kingdom. Subsequently, there were official trading expeditions between the two countries from time to time. The documents also recorded many shipments of gifts to the Emperors of China in those years.[1]

Following the inauguration of Ayutthaya City as the capital of Siam in 1351, there were more records describing maritime trade: Siam imported ceramics, silks and satin from China, on the one hand, and, on the other hand, she exported timber products, ivory tusks, scented wood, sampan wood (Acacia sp.), leather, and lead as well as Sangkhalok ceramics and other pottery to other Southeast Asian countries. Every junk had far to sail regardless of its exact destination. Not only trade goods but also life's necessities such as food and water, medicine and items of everyday use such as cooking and storage containers, as well as sources of recreation were stored on board.

There was no guarantee that a ship setting off on a sea voyage would ever reach its destination and the perils of sea travel in those days are reflected in the number of shipwrecks extant on the sea-bed, especially in the gulf of Thailand. Some parts of these wrecks are still intact and in relatively good condition because of the preserving nature of their watery resting places. Now, centuries later, they live in expectation of our generation and its successors that they will reveal more knowledge about the past.

Underwater Archeological Sites in the Gulf of Siam

The Gulf of Siam has been an important territorial waterway and the scene of much sea traffic for centuries. In geographical terms, gulfs are reputed for their calm waters, but it is impossible to predict every storm that occurs there. Likewise, despite its popularity as a sea route since ancient times, the Gulf of Siam has also been the theatre of many storms, which have taken unlucky vessels to their unenviable end.

Since 1977, the Underwater Archaeological Project, under the Archaeology Division, Fine Arts Department, Thailand, has undertaken surveys, excavations, and other research on wreck sites off the coast of the Gulf of Siam. Eight shipwrecks dating back to the period from the fourteenth to the seventeenth centuries were found, namely: Sattahip, Rang Kwien, Pattaya, Ko Kradat, Si Chang 1, Si Chang 2, Si Chang 3, and Samui. Furthermore, there are six other sites which have undergone surveys and yielded material evidence, namely the sites of Presae, Bang Ka Chai, Ko Rin, Samae Sarn Channel, Hin Lak Bet, and Don Hai; but the ships themselves have not yet been located,

Archaeological objects and features from the sites mentioned above provide the most important evidence currently available for the study of the history of maritime trade between China and Southeast Asian countries. Tangible evidence, which can prove or disprove written records, also serves a possibly more useful purpose by shedding more light on the subject through the revelation of other aspects involved and the scope required to synthesize the information in an attempt to uncover the realities of previous times.

Evidence of Maritime Trade from the Gulf of Siam

Types of evidence include the ship's structure, merchandise, and other artifacts as summarized below.

Ship

The most important clues are found in a study of the body of the ship itself. It is necessary to regard the ship as a mobile home, an office, a means of transport, a conveyer of cargo, and also sometimes as a factory. Evidence of the physical components of the ship found in the Gulf of Siam can summarily be described here:

The Sattahip Wreck

This is also called the Ko Khram Wreck, located at 38-43 meters (126-143 feet) below mean sea level in the channel off Ko Khram ("Ko" is a

Thai word meaning "Island"), which faces Sattahip bay, Chonburi province. This is the first underwater archaeological site that the Fine Arts Department, with the cooperation of the Royal Thai Navy, surveyed and excavated, between 1975 and 1977.[2] The structural components such as wood planks from the hull, bull-heads, and ribs were discovered in the sand. The species of wood used to make this structure were identified as pegs and bolts and were made of Terminalia mucronata (sp.), Terminalia (sp.), and Garcina cornea (sp.).[3]

The vessel was built by using an even-edge-joined building technique with a double-planked hull. Wood pegs and bolts were used to hold the planks together. The cargo walls were fastened to the wooden deck planks with iron nails and split bamboo flooring lined the wooden deck. Presumably, the Sattahip vessel is a flat junk and has no keel. The deck was approximately 8 meters wide and 32 meters long.

The Rang Kwien Wreck

This is known as the Nga Chang Wreck or Chinese Coin Wreck among the amateur divers, as ivory tusks and Chinese coins (its main cargos) were discovered in abundance at the time they visited it. It is located at a depth of 21 meters (80 feet) in the Ko Khram Channel about 10 kilometers west of Bang Sa-re Bay and about 800 meters from the Rang Kwien Islet.[4]

Although surveys and excavations of this wreck site were carried out over four successive years (1978-1981), only a few pieces of the ship's structure were found such as the keel, wood planks from the hull, ribs, and the carved decorated pieces for the aft-deck. In addition, there is a Chinese bronze mirror piercing the keel as a lucky amulet to prevent disasters, reflecting a traditional belief and preference among Chinese shipbuilders and sailors.

The even-edge-joined building technique was applied in the construction of this vessel and the round-headed wooden pegs were used to fasten the planks to the ribs. The ship is thought to be 25 meters long.

The Pattaya Wreck

This wreck is located at a depth of 26 meters (90 feet) in the channel between the south beach of Pattaya City and Ko Lan, Chonburi province. The site is situated near the shore of the most popular beach in Thailand. Therefore, it has often been disturbed by tourists, amateur divers, and treasure hunters over a long period of time. There are traces of destruction of the site by means of explosives and most parts of the vessel have been seriously damaged. Structural remains suggest that the Pattaya vessel had a triple-planked hull which was fastened with wooden pegs. The structure was constructed of Shorea (sp.) and Diterocarpus (sp.)

wood. The vessel comprises multiple cargo holds, each of which was separated from the other by split bamboo walls.[5]

The Ko Kradat Wreck

This vessel sank in 3 meters (5-8 feet) of water on the coral reef near Ko Kradat, Trad province. The wreck has often been disturbed by treasure hunters and has been badly damaged. Survey and excavation work in 1978 brought to light part of an even-edge-joined-double-planked hull, the planks of which were fastened by wooden pegs and bolts made of Terminals (sp.) wood. The junk at Ko Kradat was presumably a local Southeast Asian construction based on the Terminalis (sp.) which is found only in Southeast Asia and Africa, but not in China.[6]

The Si Chang 1 Wreck

This wreck is located at a depth of 31 meters (100 feet), 3 kilometers west of Ko Si Chang at the mouth of Chao Phraya River. The Underwater Archaeological Project, Fine Arts Department, Thailand, in cooperation with the Institute for Maritime Archaeology and the Western Australian Museum, undertook surveys and excavations of this wreck site between 1983 and 1985.[7] The result of research yielded many interesting aspects from the remains of the vessel including:

1. ***Keel***
   A very long piece of 200 mm thick wood with a trapezoid cross section; the shorter side of the parallel side is facing upward.
   - *1.1 Wooden plank floor*
     Dipterocarpus (sp.) wood was cut into short planks measuring 800-850 mm long and 150-300 mm wide. These planks, found in the cargo holds, were presumably the floor lining.
   - *1.2 Inner hull planks*
     These planks are made of Shorea (sp.) and were fastened together with round headed wood pegs in an even-edge joined fashion.
   - *1.3 Bottom lining planks*
     Soft wood (pine) planks, each between 200 and 300 mm wide, were used to line the bottom of the vessel between its ribs.
2. ***Ribs***
   Only three pieces of ribs were found. They are made of Shorea (sp.) and Dipeterocarpus (sp.) wood.

2.1 Bulkhead
The bulkhead is made of Shorea (sp.) wood and was laid attached to the ribs.

A study of the structure of the Si Chang 1 Wreck suggests that the vessel had a keel, and all its components were fastened together with wooden pegs and bolts made of Cassia fistula (sp.). However, the nationality of the owner or the origin of the ship was still unknown.

The Si Chang 2 Wreck

The vessel is located at a depth of 25-27 meters (85-90 feet). The Underwater Archaeological Project of the Thai Fine Arts Department cooperated with the Institute for Maritime Archaeology and the Western Australian Museum in undertaking surveys of the wreck site in 1982, 1985, and 1986. The site was actually excavated in 1987. Only parts of the vessel submerged in sand, including sections of a double-planked hull and bottom planks fastened together with wooden pegs and metal nails, have survived. The keel of the vessel could not be found.

The Si Chang 3 Wreck

This vessel is located at a depth of 24 meters (80 feet), approximately 7 kilometers northwest of the northern end of Ko Si Chang. The Underwater Archaeological Project of the Thai Fine Arts Department cooperated with the Institute of Maritime Archaeology and the Western Australian Museum in undertaking surveys of this wreck site in 1986. The result of the research has yielded many interesting aspects of the vessel's remains, including:

1. Keel
The keel of this vessel is made of three pieces of wood measuring up to 15 meters in length.

1.1 Hull planks
The hull of the vessel was constructed by using a double-planking technique in an even-edge-joined fashion. The inner hull planks were fastened together with round-headed wooden pegs. Metal nails were used for the outer hull planks made of Terrieta (sp.) and Herieta (sp.) and were also used to fasten both layers of the planks together. Ships built according to this technique were common throughout Southeast Asia.

1.2 Bulkheads
Nine bulkheads were found in situ, tightly fastened above the ribs, situated across the keel.

1.3 Maststep

This is a very thick, rectangular piece of wood situated across the keel, fastened tightly to the bulkhead. On the upper surface of the bulkhead, there are two rectangular dug-out pits for fixing the mast support poles.

The Si Chang 3 Wreck is presumably a small vessel with a deck measuring approximately 6 meters in width and 24 meters in length.

The Samui Wreck

This ship is located at a depth of approximately 19 meters (60-65 feet) in the channel halfway between Ko Tean and Ko Samui.

The wreck has been plundered as have many of the sites mentioned above; however, the results of the excavation in 1984 provided evidence of a double-planked wooden hull. Wood planks about 180-200 mm thick were fastened directly to the ribs. The keel of the ship has not been located. This vessel is presumably a flat bottomed junk, the deck of which measures about 18 meters in length and approximately 4-5 meters in width.

Merchandise

Remains of cargo provide important clues in the historical study of maritime trade because the items can often be traced to their place of origin, and sometimes suggest their intended destinations. Orders from western countries requesting their Southeast Asian representatives to purchase timber products and organic goods from ports in the Ayutthaya Kingdom regularly included rice, leather, sampan wood, buffalo horns, scented krishna (Eagle wood), rattan, palm sugar, teak wood, lacquer sap, wax, ivory tusks, honey, areca nut, brown cane sugar, lead, tin, glazed stoneware (Sangakhalok ware), and earthen ware.

Because these wrecks have been lying on the sea bed for many hundreds of years, most of the organic remains (which decay easily) have vanished from their sites. Although only minute fragments of these organic products remain in a most dilapidated state, conditions of preservation under the sea are much better than on land. This evidence is considered important as it indicates the nature of the cargo transported in these times. The remains of merchandise discovered at the wreck sites in the Gulf of Siam are described below.

Organic materials

1. Ivory

A big shipment of ivory (about 25-30 pieces) was found in the Rang Kwien Wreck in the 1981 excavation. Most of the pieces

are large. The diameter at the thick end measures 1,500-1,700 mm. They were neatly laid in a group on round-headed tie supports. The condition of these ivory pieces was so bad that salvage possibilities were not considered promising and the pieces were consequently left in situ. Furthermore, ivory was found in smaller amounts accompanying other products in the Sattahip and the Si Chang 2 wrecks.

2. ***Sampan wood: Acacia (sp.)***
   Samples of sampan wood were found in all of the Si Chang group wrecks.
3. ***Leather***
   Only small pieces of leather were found in the Rang Kwien wreck; however, their poor condition and the size of each piece provided samples which were inadequate for species-determination analysis.

Inorganic materials

1. ***Ceramics***
   The large number of items included in this category makes up the greater part of the merchandise found. Moreover, ceramic products tell stories of their own when considering factors such as source materials, potting techniques, decoration, and kilns. Some pieces even bear the name of the artist or the reign of the emperor who supported the industry. Ceramics found at the wreck sites in the Gulf of Siam can be divided into four groups according to their origin or place of manufacture.[8]
   1.1 Thai Ceramics
   Sangkhalok wares, the celadon-type of glaze applied to white-clay stoneware produced by the Si-Satchanalai and Sukhothai kilns, north central Thailand, were the most common type of Thai ceramics found at almost all the wreck sites. For example, large quantities were found in the Sattahip wreck, the Prasae site, and the Ko Kradat wreck, and some pieces were also found in the Samui wreck. Chaliang ceramics, a celadon-type group glaze on dark-body stoneware originating from the Ban Ko Noi Kiln site, Si-satchanalai, were found in the Rang Kwien wreck. Many heavy storage containers and utility wares such as brown glazed four-eared jars, mortars and large bowls from the Mae Nam Noi kilnsite were found in the Sattahip wreck, the Si Chang 1, 2, and 3 wrecks, and the Ko Kradat and Pattaya wrecks, at the Don Hai site and other coastal sites.

1.2 Chinese ceramics

Many grades of Chinese ceramics were exported. Those which were found at the wreck sites in the Gulf of Siam can be described as follows:

a. *High quality blue and white porcelain known as Kraak ware*
This porcelain was produced at the royal Qing-Te Chen kilns in Jiangxi province, South China during the reign of Emperor Wan Li (1573-1619) at the end of the Ming Dynasty. A large number of these wares were found in the Si Chang 1 wreck.

b. *Medium to low quality blue and white wares known as Swatow ware*
Swatow ware is named after the town on the Southeast coast of China, Chin Cheuw, in Guangdong province. Chinese ceramics in this category were dated from the Ming Dynasty, in the second half of thirteenth century, to the Qing Dynasty, the eighteenth century. This type of ware has been found throughout Southeast Asia and was found in the Samui, the Ko Kradat, and the Si Chang 1 wrecks as well as at the Ko Rin site.

c. *Celadon ware*
These ceramics were popular export goods from the Longquan kilns in Zhejiang province, South China, during the Yuan Dynasty. Celadon ware was found in abundance in the Rang Kwien wreck and some also in the Samui wreck.

1.3 Vietnamese ceramics or Annamese ware

Most of the Vietnamese ware is glazed stoneware; however, many types of ceramics originating from Vietnam can be categorized as follows:

a. *Brownish celadon glazed ceramic*
Hundreds of this type of Vietnamese ware, comprised of plates and bowls, were found in the Sattahip wreck. Colours of glaze range from brownish green to yellowish green. One can see the ring mark left on the inner bottom of these bowls when glaze was wiped off to prevent it from fusing with the glaze above it during the firing process.

b. *Under-glazed blue and white design on buff stoneware body*
This type of ceramic was found in abundance in the Rang Kwien wreck and some in the Si Chang 3 wreck.

c. Buff-colored glazed ceramics

This type was found in abundance in the Rang Kwien wreck.

1.4 Pottery of unknown origin

Fluted kendis were found in large numbers in the Si Chang 1 wreck and some were also salvaged from the Sattahip wreck and the Ko Rin site.

2. Metal

Artifacts made of metal include:

2.1 Lead

Lead was found in the form of ingots. These ingots are of various shapes, the most common of which being a short cone. However, cylindrical and lime fruit-size, spherical ingots were also found. Ingots were discovered in abundance in the Pattaya, the Sattahip, and the Si Chang 1 and 3 wrecks. Ancient lead production sites were discovered in the Si-Sawat, Thong Pha Bhume, and Sagkhla-buri areas in Kanchanaburi province.[9] Lead ingots found at those sites and in the wrecks are similar in shape and size.

2.2 Iron

Iron was imported both as a raw material and as finished products. Large cooking pans were found in the Rang Kwien wreck and knives were excavated from the Don Hai site. Heaps of smelt iron were located in the Pattaya wreck's cargo holds.

2.3 Chinese cash coins

Thousand of coins weighing many tons were discovered in the Rang Kwien wreck. Many of them were fused together in lumps while many others had retained their original shape, indicating that they were once tied together with silk cords. The coins were cast from an alloy of copper/tin bronze and contain a high percentage of lead.[10] Each coin has a reign mark. The majority of the coins found in the Rang Kwien wreck were dated from the Song dynasty, and some were from the Tang, Yuan and some are similar to those of the Qing Dynasty. The fact that money was used as a means of exchange in the maritime trade is a proposed hypothesis. Given the fact that the sheer number of coins discovered is so enormous (quite apart from their value), and that from the thirteenth century to the reign of King Rama IV of Bangkok in the nineteenth century, the acceptable form of currency for maritime trade in Southeast Asia was Chinese cash coins, it is possible that the Rang Kwien vessel was carrying such coins for trading purposes.

Additional Archaeological Evidence

Another missing piece of our puzzle in that the sites are devoid of any evidence of the skeletons of the sailors or maritime merchants who must have died many hundred of years ago. Unlike today's ships, the junk, with less superstructure, had an open deck, with the result that when the vessel appeared to be doomed, the passengers would have been able to jump clear in time to save their lives. If individuals then failed to survive, their corpses would have been carried away by currents or eaten by sea creatures.

Food

A round-bottomed pot filled with eggs was salvaged from the Si Chang 3 wreck. A medium-sized four-eared storage jar containing fish products was found in the Si Chang 1 wreck. In the Pattaya wreck, a storage jar containing rice was also discovered and poultry bones were found in the Samui wreck.

In many wrecks, areca nuts and round-bottomed pots called palm-sugar pots were found—sugar is considered to have been a staple food for seafarers and also a trading commodity. Furthermore, a couple of bronze fish hooks were found in the Rang Kwien wreck and presumably the sailors used to fish during the voyage.

Kitchen utensils

Many round-bottomed earthenware cooking wares and wood charcoal stoves were found in all the wrecks and at their associated sites. Earthenware pottery which can shrink or expand while cooking over the fire, is brittle and easily damaged. Therefore, a good supply had to be carried in stock especially because of the added hazard of the rocking motion of the ship. Mortars, mixing bowls, and whetstones, which are utensils used in every Southeast Asian household, were also found in the wrecks.

Musical and Signaling Instruments

A bronze gong, a bell, and a tunning peg for string instruments were found in the Rang Kwien wreck. A pair of cymbals was found in the Samui wreck. The bronze gong and bell were presumably used as signaling instruments to communicate on board the vessel.

Jewelry

A pair of gold bracelets decorated with precious stones and made by an artisan in the early Ayutthaya period, as well as a straight jeweled hair pin and ivory ring were found in the Ramg Kwien wreck. A gold pendant decorated with rubies was found in the Sattahip wreck.

Games

Three chessmen were found in the Si Chang 1 wreck.

Miscellaneous

Excavation at the wreck sites uncovered many other items of daily use belonging to both sailors and merchants of the past, such as bronze key sets, musket rifles, and bronze lime jars.

Discussion and Conclusion

Underwater archaeological sites are considered to be one of the most important sources of information for the history of our nation and for that of humanity as a whole. The amount of information depends on the circumstances of recovered wrecks and objects: a wreck can reveal its own history and age, as well as the number of times, and where, it docked. We are able to study the lifestyles, technology, beliefs, means of transport, and especially the maritime trade of our forefathers by examining personal items such as clothing and jewels, cult icons, and items of everyday use, such as fishing tackle, storage containers and cooking utensils, food, weapons, and merchandise.

We can now comprehend the history of the maritime trade from archaeological evidence as given in the following summary:

Ships

There were two types of cargo junks sailing in the Southeast Asian sea between the fourteenth and the seventeenth centuries: the flat-bottomed junk and the keeled junk. The techniques and materials used in ship building indicate that these ships, which are not very large, were locally built Southeast Asian vessels and not real Chinese junks.

Merchandise

The artifacts revealed during the excavations, such as ivory tusks, leather pieces, lead ingots, sampan wood, Chinese ceramics, Vietnamese ceramics, Sangkhalok (Thai) wares, and iron cooking pans and utensils, are among the categories mentioned in the documentation records.

This material evidence from the Gulf of Siam provides a comprehensive, if not yet clear, knowledge of maritime trade in Southeast Asia from the fourteenth to the seventeenth centuries. Gaps occur in the records as only a few wrecks and sites have been discovered. The survey and excavation process has progressed slowly and with great difficulty, and entails risks to those involved in this environment so unfamiliar to man. Perhaps a more serious problem arises from the looting and

destruction by treasure hunters who are stimulated by antique dealers, collectors, and interior decorators. The pieces which are most difficult to obtain command the highest prices on the antique market. Artifacts from archaeological sites both on land and underwater can now be found in hotel lobbies, well-appointed houses, antique shops, furniture shops, and gift shops. The smuggler approaches a site unscrupulously, and other artifacts and features without a high market value are intentionally destroyed in the plunder to ease the way to this ultimate prey, in many cases by means of explosives.

This kind of behavior must be discouraged. Mere possession of an antique item whereby the owner can show off his affluence is, in effect, an encouragement to the destruction of archaeological sites. At present, there are no wreck sites available in a suitable state for our successors to study. As an archaeologist who also works in the conservation field, the author would like to mention that wreck sites—as a source of cultural heritage—have a value which goes beyond the reconstruction of our history; in fact, the history of humanity is at stake. Although these wrecks were found in Thai territorial waters, the movable nature of the crafts themselves and the many places from which their cargo originated means that we can be certain neither of the nationalities of the owners and the crew on board, nor of their last port of call or destinations.

The public is now being made aware of the destruction of the natural environment. Many agencies are promoting and attempting to restore the balance of the natural ecological system. The coral reefs which represent another marine resource in critical state are at present under the protection of legislation and active agencies. The concept of the cultural environment has not yet been fully perceived. However, ethnical values should be promoted because archaeological artifacts and features are individually very significant. Time and tide cannot return, though they do leave us some evidence. If destroyed, that evidence will be impossible to replace.[11]

Notes

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