THE WRECK ON THE LENA SHOAL

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1. The development of Chinese maritime commerce

There is proof of the existence of a sea route along which goods were traded between the Mediterranean basin and China as early as the Han dynasty (second century BC – third century AD). Second century Roman coins, Hellenistic intaglios, Chinese brass and Indian jewellery have all been found during excavations at Oceo, a port in the south of the Indo-Chinese peninsula which was at its busiest between the sixth and eleventh centuries AD.

During the Eastern Han dynasty (25 BC–220 AD), Chinese silks reached the Roman Empire via the high seas, which hastened the development of ports such as Guangzhou on the south coast of China. Towards the end of the third century AD, China improved its relations with its neighbours along the South China seaboard. From the fifth and sixth centuries, large colonies of foreigners from the countries engaged in trading were established in China. Some merchants came from as far away as the Middle East.

The reunification of the Chinese states under the Sui dynasty (581–618) and the prestige of the Tang Empire (618–907) facilitated sea trading around the South China Sea and the annals of the Tang dynasty mention the fact that Chinese junks frequently sailed to the Moluccas.[1] At the time, trade was also particularly brisk with the Islamic world and the kingdom of Srivijaya. The port of Guangzhou experienced intense activity and became a large and prosperous cosmopolitan city. Luxury products such as incense, ivory, camphor, tin, spices and precious woods were brought in from various trading posts, and ships sailed with cargos of ceramics and silks.

This flourishing trading port was attacked by Arab and Persian pirates in 778. Then, in 878, the army of the rebel Huang Chao again attacked the city, with the resulting massacre of 200,000 Muslims, Christians, Jews and Zoroastrians.[2] These events contributed massively to the port's decline. The destruction of Siraf in 977, which caused a major decline in trade in the Persian Gulf only exacerbated the slowdown in activity of this great port.

Although sea trade between the Persian Gulf and South China had existed since ancient times, it was only under the Song dynasty (960–1279) that it expanded considerably,[3] thanks to the use of large junks that were capable of protracted sea voyages and the development of navigation techniques such as the compass and the axial rudder.[4] Political and economic circumstances favoured this development. Invasions of the land-bound north and north-east of the Empire made trade with central Asia difficult and caused the Chinese population to move southwards to the coast, where trade was more important than in the agricultural regions of the north and centre.

The emergence of a trading class changed society in the urban centres which became less aristocratic in character and more oriented towards trade and crafts. The state favoured this change in the economy by reforming the taxation system, making it more flexible and attempting to standardise the copper coinage, before introducing paper money in the early eleventh century.

The period of commercial expansion, which lasted from the eleventh to the thirteenth centuries, was made possible by the development of a huge network of navigable waterways covering 50,000 km, based on the Yangtze River and its tributaries and the construction of canals.

Maritime trade further increased when the Song imperial family withdrew to the South, abandoning their capital, Kaifeng, after its capture by the Djurtchets. Hangzhou was made the imperial capital in 1127. Henceforward, sea trading became more important than land-based trading. The building of large junks capable of braving the high seas seems to have begun in the later ninth or early tenth century. Shipyards were constructed in the Yangtze estuary, which was large enough to be the perfect interface between river and sea navigation.[5]

The seafarers of the Empire sailed in imposing, four to six-masted vessels, learning from the Arab and Persian navigators, who had been the first to take advantage of the trade winds, buying and selling their wares in the southern regions of the Chinese world. The trade winds (north-east winds blowing south-eastwards in winter and south-west winds blowing north-eastwards in summer) had always governed navigation in these regions.

[1] The annals of the Tang Dynasty (618–906), mention these isles under the name of "Mi-li-kü".

[2] J. Dars, *La marine chinoise du X^e siècle au XIV^e siècle*, Etudes d'histoire maritime 11, Economica, Paris, 1992, p. 389.

[3] J. Gernet considered this to be one of the most important developments in the history of Asia. See *Le monde chinois*, A. Colin, Paris, 1972, p. 765.

[4] The existence of the compass is documented from the beginning of the 12th c. The Chinese author Zhu La mentioned it in 1119 under the name zhinanzhen: "The needle which shows south".

[5] Gernet, 1972.

The number of Chinese vessels increased during the Song dynasty, thanks to the opening of numerous shipyards at Guangdong, Fujian and Zhejiang, where numerous sea-going junks were built. Trade between the Empire of the Middle and the lands of South-East Asia, known as the "Nanhai trade", thus took on considerable importance.

The routes taken by the junks can be retraced thanks to written Chinese sources of the period. Of course, the Chinese placenames are different to those used currently, and complex research is often required in order to correctly identify the names of the trading posts at which the junks called on their first trading missions. Several large ports vied for the Nanhai trade but Quanzhou in the province of Fujian, was the most important. The development of this city can be followed from the ninth century AD. In 834, an imperial edict ordered that all the foreign merchants who frequented the ports of Guangzhou, Quanzhou and Yangzhou should be treated hospitably and be permitted to trade freely.

The presence of a large Muslim community in Quanzhou is proved by the existence of its Ashab mosque, founded in 1009; at the time, there were five other Islamic places of worship in the city.[6]

Under the Song dynasty, Quanzhou and Guangzhou traded mainly with the countries of South-East Asia, the lands bordering the Indian Ocean, and the Middle East. Until the late eleventh century, the absence of a customs post at Quanzhou forced merchants to perform the administrative formalities in Guangzhou.

In 1087, a customs post was opened at Quanzhou, manned by a government-appointed inspector. Conditions for visitors to the city were improved, inns were opened and measures taken to facilitate trade. Foreign merchants settled in the city and formed an influential community. Quanzhou eventually became the largest port in China. Communications with the imperial capital, Hangzhou, were good and the port played an essential role in the Nanhai trade as well as in relations with countries bordering the Indian Ocean and the Middle East.

Upon his arrival in China, Marco Polo[7] was astonished at the port of Zaitun (Quanzhou) "to which all the vessels of India come with much costly merchandise and many precious stones of great value and many large, good pearls, and through which passes such a great abundance of merchandise and precious stones that it is a wonderful sight to behold. We have been told that for every ship laden with pepper and bound for Alexandria or elsewhere to be transported to Christendom, more than a hundred enter this port".

In the early fourteenth century, the Arab traveller Ibn Battuta states that Zaitun was the largest port in the world,[8] accommodating countless small junks and hundreds of gigantic ships.

[6] Chen Da-sheng and L. Kalus, *Corpus d'inscriptions Arabes et Persanes en China: I, Province du Fujian*, Bibliothèque d'études Islamiques, Vol. VIV, Paris, 1991.

[7] Marco Polo, *Le devisement du monde. Le livre des merveilles. La Découverte*, Éditions François Maspero, Paris, 1980.

[8] C. Defrémery and B.R. Sanguinetti, *Voyages d'Ibn Battuta*, Paris, 1854.

2. Navigation to the Philippines in the fifteenth century

Under the Song and Yuan dynasties, long-haul voyages were deliberately encouraged by the government, although restrictions were sometimes imposed such as those relating to the export of certain metals.[9] Borneo[10] was a major crossroads on the maritime trading routes and a favourite destination for junks during the Song dynasty. This fact is confirmed by the Chinese coins and Song ceramics found there, especially at the site of Kota Batu in Brunei.

In fact, China seems to have established regular trading relations with the Philippines archipelago from the late twelfth century. One of the main navigation routes between China and Borneo was via the internal sea of the Philippines archipelago. Chinese merchants could not have avoided bartering with the islands past which they sailed. There is much archaeological evidence of trade between the Empire and the archipelago, starting during the Tang dynasty.

Although Palawan is not mentioned specifically, there is archaeological evidence to show that ships sailed the length of this large island during the Song dynasty.[11]

Hongwu (1368–98), the first Ming emperor, played a crucial role in the huge increase in Chinese sea trade thanks to his energetic action to rid the Chinese coasts of the pirates that plagued them and his impressive policy of reforestation that would eventually result in a major ship-building programme.

After the short-lived reign of his grandson, Jianwen, his brother Yongle (1403–24) came to the throne and introduced a remarkable expansion policy for navigation. He constructed a massive fleet consisting of ships, some of which, namely the treasure ships, were of impressive size. Within the space of a few years, between 1405 and 1421, he ordered six different expeditions to set sail on the China Sea bound for the Indian Ocean. These huge trans-oceanic expeditions, most of them commanded by Admiral Zheng He, were the Far Eastern counterpart of the Portuguese and Spanish voyages of discovery of the fifteenth and sixteenth centuries. They visited in succession, Malacca, Ceylon, Calicut, Hormuz, and Aden. In 1433, a seventh expedition reached the east coast of Africa. These expeditions were an opportunity for trading and the treasure ships brought back lavish gifts from the kings and princes of the visited regions as tributes to the emperor. Malacca was one of the principal ports for the redistribution of products from the Chinese Empire to the Indonesian archipelago and the Islamic world. Numerous Arab ships plied between this great trading port and along the Malabar coast to Calicut, Aden and Hormuz. In the course of his expeditions, Zheng He founded an official and permanent trading-post in the port.

Trade between China and the Philippines experienced further considerable expansion under the Ming dynasty. These countries even exchanged ambassadors, such as the ambassador who was received in 1372 by the Emperor Hongwu. In the late fifteenth century, government-run trade was gradually taken over by the Chinese shipowners. In the reign of the Emperor Chenghua (1465–87) several shipowners supplied and provisioned ships for large trading operations in the ports of South China, which became a hive of activity. Malacca, Korea, then Manchuria, were regular ports of call for the merchants, while Chinese influence in Borneo and the Philippines increased perceptibly. By the turn of the fifteenth century, almost all the sea trade with the Philippines was in the hands of the Chinese. Several original Chinese writings deal with the Nanhai sea trade, explaining the navigation routes, the countries to which Chinese goods were exported and the opportunities for barter in exchange for local goods. Sometimes information is given about the goods that were the most sought after, region by region.

2.1 Manufactured goods for export and goods imported into China

The *Chu-fan-chi*[12] (Description of the Barbarian Peoples) written by Zhao Rugua is a document that is essential reading in order to understand the traditional Nanhai trade. The author was the Inspector of Foreign Trade in the province of Fujiang, under the Southern Song dynasty (in the early thirteenth century). This document describes the lands and peoples with whom the Chinese merchants traded and provides valuable information about the products that were sold or bartered in exchange for goods which were much in demand in China. If goods for export, such as silks and certain types of ceramics, changed with the fashions of the times, or due to regulations imposed on foreign trade, such as the ban on the export of metals, for example, it can also be assumed that the goods brought back from these lands by the Chinese merchants were probably the same as they had been in the fifteenth century, when the Lena Shoal junk sailed.

[9] Many edicts prohibiting the export of metals were passed by emperors over the centuries. See on this subject W. Rockhill, "Notes on the Relations and Trade of China with the Eastern Archipelago and the Coast of the Indian Ocean during the Fourteenth Century", *T'oung Pao*, vol. XVI, Leyden, 1913.

[10] The annals of the Song dynasty (960–1279), the *Song shi* and *Song hui yao* mention Borneo under the name of "P'o-ni" .

[11] Goddio and Dupoizat, 1993.

[12] Zhao Rugua, *Chu-fan-chi*, translated by F. Hirth and W. Rockhill, Imperial Academy of Sciences, St. Petersburg, 1911.

Fig.4. Map of maritime routes employed by junks in the 15th century.

The long list of these products is interesting. It includes spices such as cloves, nutmeg, cardamom and pepper; fragrant incense and medicines such as camphor, frankincense, myrrh, benzoin, ambergris, areca nut, aloes, rhinoceros horn, civet, musk, asa-fœtida, beeswax, hornbill beaks and seahorses; and luxury items such as fine pearls, precious stones, kingfisher feathers, tortoiseshell and ivory; precious woods such as sandalwood, ebony, gharuk, laka and sapan; and exotic foods such as swallows' nests from the caves of Niah, sea cucumbers and jakfruit.

Nutmeg and cloves originated from the Moluccas in Indonesia. In 1605, the Dutch took over the monopoly of nutmeg and cloves by chasing away the Portuguese who had already settled in the Moluccas. In order to maintain this monopoly and to avoid allowing cultivation to expand to other islands, they limited their production to two islands belonging to the Moluccas, Ternate and Tidore. There they installed an authoritative customs policy. Because the two islands were easy to supervise, they were able to achieve their aim of eliminating all of the other plants from the remaining islands of the archipelago, and held their monopoly status for a century and a half.

Cloves were also used by the Chinese as they were well known for their medicinal properties long before the Christian era, around the third century BC. Around 200 BC, cloves were imported to China from Java for the court of the Han dynasty (206 BC–220 AD), so that courtisans could purify their breath before standing in front of the Emperor.

The Portuguese discovered the Moluccas in 1511 and soon snatched them from the natives. They then started to limit the repartition of clove plants. In 1605, the Dutch took control of the Moluccas until the eighteenth century, and control on production was made even tighter in order to maintain prices artificially.

2.2 Maritime routes

One of the most important sources of descriptions of the maritime routes used in the fifteenth century by Chinese sailors is the *Shun Fêng Hsiang Sung*.[13] This anonymous compilation was written c. 1430,[14] but in its present form it contains material added in 1571. Apart from the fact that it provides interesting information about the theory of navigation, the document lists 100 different maritime routes and offers relevant information about certain localities. It lists which maritime routes to follow, including those from South China to the Indonesian archipelago, the Malabar Coast, Yemen, the Red Sea, the Sunda Islands and the Sulu Sea. This guide also offers a compilation of various nautical instructions including the observed heights of the stars[15] (which should match the zeniths of the stars mentioned) and estimated nautical distances in *keng* (a measurement of time of about 2.4 hours; if matched with the speed of a junk, this would produce a distance of 10 nautical miles per *keng*, an average speed of about four knots).

The *Shun Fêng Hsiang Sung* shows that if navigators left from the southern ports of the Middle Empire, they had a basic choice between two main routes, the western route along the Chinese coast to the Malay peninsula and into the Indian Ocean, or the eastern route, crossing the South China Sea to the islands of Luzon and Mindoro, with an extension along the east coast of Palawan, ending either at Balambagan, Borneo and Java or the archipelagos of the Celebes or the Moluccas. Of course, there were many variations on these routes.

One important fact should be noted: there is no mention anywhere of a route along the west coast of Palawan (where the junk in question was found). It does not feature among the main routes nor any of the secondary variations. The "Palawan Passage", as it is now called on marine charts, seems not to have been mentioned at all until the late sixteenth century. Pedro Fidalgo's voyage on a junk, illustrated in a map by Fernão Vaz Dourado dating from 1571,[16] alludes to this passage, though there is a lack of topographical precision. In fact, the passage was still little known to Europeans even as late as the end of the eighteenth century.[17]

The presence of submerged rocks just below the surface and the rarity of suitable sheltered anchorages in which a ship could take refuge during the storms that

[13] *Shun Fêng Hsiang Sung*, Laud MS, Or. 145, Bodleian Library, Oxford.

[14] J. Needham, *Science and civilisation in China*, Cambridge University Press, Cambridge, 1971.

[15] It is interesting to note that many of the texts that deal with maritime navigation mention that sailors steered by the stars and spoke of the star zeniths they observed. Yet the observed height of a star cannot provide a direction to follow, even less indicate a position. Only when the stars are at their zenith can they give a mariner information about his latitude in that he can relate it to the celestial pole, since the declination of each star is more or less constant over time.

[16] A. Kacmerer, "La découverte de la Chine par les portugais", *T'oung Pao*, 1944.
Map by Fernão Vaz Dourado in the Arquivo Nacional da Torre do Tombo, Casa Forte No. 70. This map contains a long caption in the area of the China Sea, referring to a barrier of islands of which the southernmost are in the position of the islands of Balabac and Palawan. The caption reads, "The coast of Luzon and adjacent islands; it is through here that Pedro Fidalgo passed from Borneo on a Chinese junk; the storm forced him to sail the length of the island, from whence he made for Lamao".

[17] In 1999, the IEASM conducted an excavation on the *Royal Captain*, a British East India Company ship which foundered in 1773 on a then uncharted reef beside the notorious Palawan Passage. Cf. F. Goddio and E.J. Guyot de Saint Michel, *Griffin, on the route of an Indiaman*, Periplus Publishing London Ltd, London, 1999, §6; and F. Goddio, *Dossier Histoire et Archéologie: No. 113*, Archéologia, Quetigny/Turin, February, 1987.

raged during the monsoon rendered this route dangerous. It would be a mistake, however, to draw the conclusion that this route to the west of Palawan was unknown in the fifteenth century. In 1988, we mentioned the probability of a route to the west of this large island, following the discovery of a late sixteenth-century Chinese junk. An archaeological excavation was conducted on this junk by the European Institute for Underwater Archaeology (IEASM)[18] which revealed that the ship had foundered with its cargo of Chinese export goods, and thus must have been on its way from China. Of course, a single example such as this would not be enough to confirm the existence of a known commercial route. We concluded in the excavation report:[19] "If similar wrecks are discovered in future in the vicinity of this passage, the theory that the traditional Nanhai trade also used a route west of Palawan would have additional support".

Since then, the IEASM has discovered four ships that were on their way from China with their cargos, but were wrecked near the reefs which mark this passage. It has conducted archaeological excavations on them[20] and found that the wrecks date respectively from the eleventh, twelfth, thirteenth, fifteenth and sixteenth centuries.

There is thus a strong probability that the route was known and in use – even in frequent use – from the eleventh century. The fact that the itinerary is not clearly indicated in any Chinese route guide so far discovered remains a mystery.

[18] F. Goddio, *Discovery and archaeological excavation of a 16th century trading vessel in the Philippines*, Manila, 1988.

[19] Ibid.

[20] F. Goddio, *Weisses Gold*, Steidl Verlag, Göttingen, 1997. Goddio et M-F. Dupoizat, "Investigator shoal wreck, Southern Song-Yuan dynasty", *Archaeological Report*, Paris, 1993.

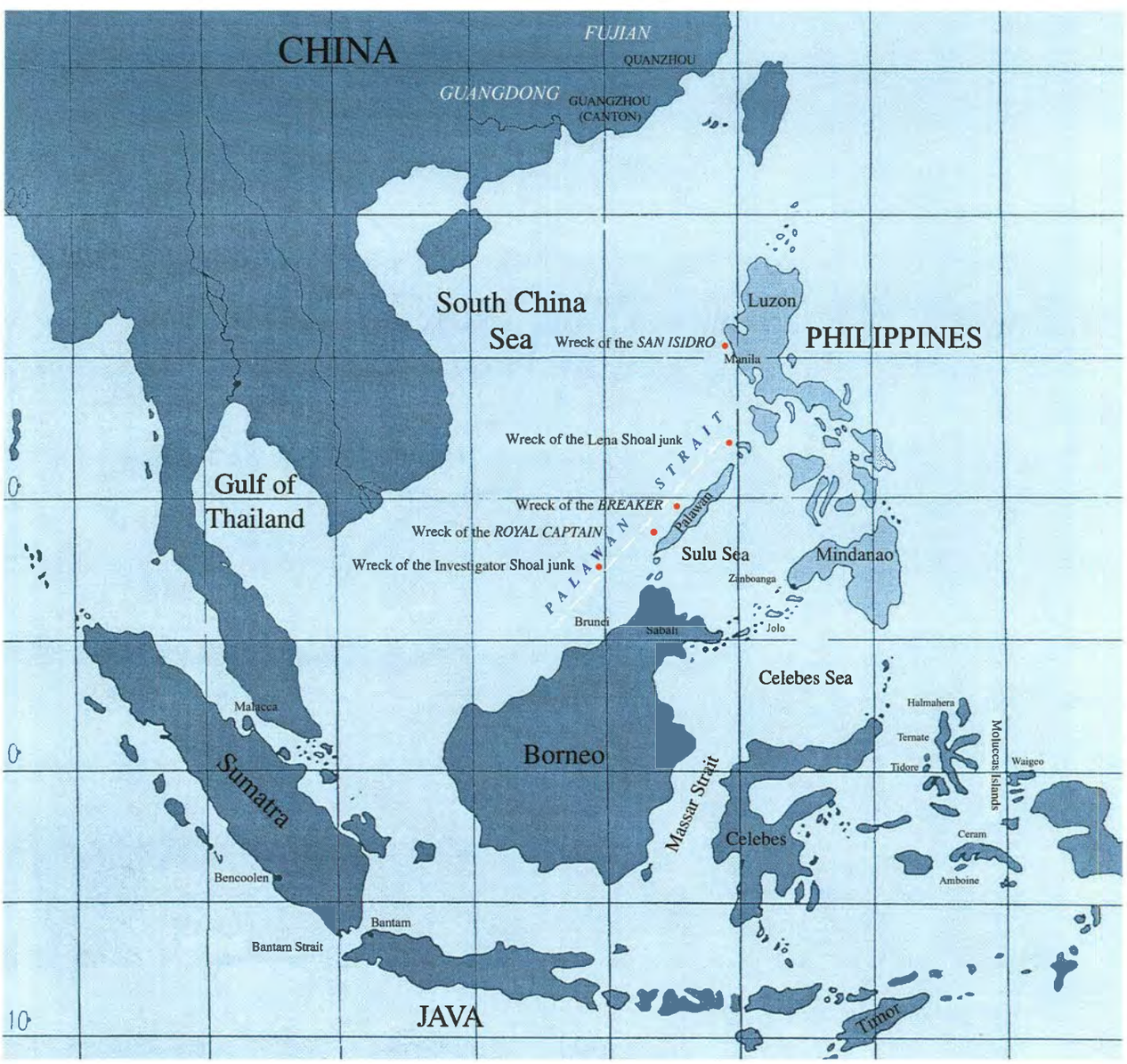

Fig. 6. Map showing the positions of wrecks discovered by l'IEASM in the vicinity of the island of Palawan.

3. Discovery of the site

On 1 March, 1996, the *Kaimiloa*, a research vessel, was sailing along the west coast of Palawan, en route to an archaeological site at which it was to perform a magnetic survey. The position of the deposit had been indicated to the National Museum of the Philippines by fishermen who had found shards of ceramics in their nets. The research team consisted of the crew plus a member of the National Museum and four members of the IEASM.

The *Kaimiloa* had just reached the Bay of Quezon on the east coast of Palawan when she received a radio message from the museum. She was to leave as soon as possible for a point at sea off the island of Busuanga, north-west of Palawan. The latitude and longitude of the site were specified but we knew no more than that, as the message then became garbled. The *Kaimiloa* changed course and six hours later, by early afternoon, she was at the site.

When we arrived, we found that great confusion reigned. Twelve pirogues had gathered at this remote spot on the high seas. A coastguard cutter was also present and seemed to have them under guard. As we approached, our team saw that the pirogues were equipped with snorkelling equipment.

The coastguard informed us of the situation. An archaeological site had been discovered by a fisherman a few weeks previously. The coastguard had been alerted to the pillaging and had intervened during the previous week, confiscating the objects raised to the surface by the illicit treasure-seekers. They had informed the museum and had handed over the confiscated material.

Although they had been warned off, the pillagers returned on a daily basis. Coastguard headquarters had thus decided on a pre-emptive strike and the museum requested us to become involved.

We decided to perform a reconnaissance dive. The sight that met our eyes on the bottom was a disaster. The sand was covered with a layer of shards of stoneware jars, blue and white porcelain and celadon ware, to a thickness of nearly 20 cm. The area covered by these freshly broken fragments was 20 m long and 15 m wide. Craters gave it the appearance of a lunar landscape. Crowbars, wooden flippers, ropes, snorkelling tubes and even a pair of wooden diving goggles had been abandoned or lost at the site. The ground was also littered with elephant tusks.

A report was made to the coastguard and to the museum, and when the coastguard mentioned that the divers claimed to have seen huge bones, the museum's representative explained to them that these were ivory tusks. Upon examination, the ceramics discovered proved to be of excellent quality and dated from the years 1480–90.

Photo 1. The IEASM research vessel, *Kaimiloa*, used for magnetic surveying.

The damage done to the site appeared at first sight to be irreparable but by the following morning, a measure of calm had at least been restored. The pirogues had made themselves scarce under threat of serious punishment by the coastguard officer. An expert survey of the site was completed in less than a week. The damage done was considerable, although the robbers appeared to have failed to penetrate right through the tumulus. In addition to the obvious damage, they had managed to destroy a lot of material that lay under the sand by probing with crowbars in various places. An archaeological excavation was recommended on what remained of the wreck and the *Kaimiloa* was to return to Manila as an expedition had to be organised.

The deposit lay at a depth of 48 m and the excavation required major logistical support. Time was short; we were convinced that the pillaging would start again shortly after our departure, as the coastguard cutter was unable to visit the site on a daily basis.

Organising such a major mission in just a few days is no easy task. No ship of suitable size was available in Manila, so we chartered a 50 m barge, the *Thania*, and a little support tugboat only 28 m long, the *African Queen*. The barge was fitted out with mobile living accommodation for the site, two compartments for bedrooms and one for the bathrooms. It was also provided with a decompression chamber, powerful 125 KVa electric generators and several tonnes of equipment.

We got a crew together in Manila in the space of a few days. The ship was provisioned with fuel, water and food. Only one week after the *Kaimiloa's* return, our little flotilla was ready for departure.

The *Thania* left the port of Manila, towed by a high seas tugboat and followed by the *African Queen*; *Kaimiloa* acted as scout and a large motorised pirogue, the *Lucky Mariner*, which was to serve as a liaison ship between the islands of Busuanga and the site, brought up the rear.

Travelling on the various vessels of the expedition were 12 members of the IEASM, six representatives of the National Museum of the Philippines and 19 crew members.

Upon arrival at the wreck site, a reconnaissance dive was arranged. The site had suffered new depredations and all the elephant tusks we had seen the previous week had disappeared. We realised that the information indicating that these were not the bones of mythical beasts who haunted the site, but were in fact ivory, had spread rapidly, and the pillagers, who had previously been afraid to touch them, had unfortunately drawn the correct conclusions from their new-found knowledge.

In four days, we anchored the barge firmly over the site and got all our equipment up and running. We also set up large canvas awnings to protect us from the burning sun.

Photo 2. The barge *Thania* anchored by six anchors over the site.

4. The archaeological excavation

The first task that awaited us, after constructing the underwater grid, was the most unpleasant one. We had to collect, shard by shard, the remains of the extensive carnage inflicted by the robbers.

The baseline of the grid was at a 90° angle to the numbers in ascending order. The mesh of the grid was one metre, so the shards collected over each square metre were placed in a plastic box and raised to the surface. There they were sorted by the material of which they were made – porcelain, stoneware, terracotta, etc. The shards were packed in nylon nets labelled with the reference number of the square in which they had been found. The labelled nets were then placed in tanks of fresh water in order to enable the ceramics to release the salts they had absorbed during their long stay in the sea. This task alone took the team one week to complete.

The proper excavation could now begin. Across the front of the grid, at right angles to the main baseline, our equipment removed the thick layer of sand that had fortunately hindered the local divers. The sediment was dislodged with the help of vacuum cleaners using suction over a section 20 cm in diameter to remove the top layers of sand and 10 cm in diameter when the archaeological level was reached. The ends of the hoses were fitted with sieves to catch any items that might have escaped the notice of the divers.

The archaeologists working on the bottom used nylon nets of various meshes, each with a polyester label attached to the handle with a plastic tie. The labels were pre-printed in indelible ink with the excavation identification code of the National Museum and a square representing the equivalent grid square.

Each item discovered was placed individually in a

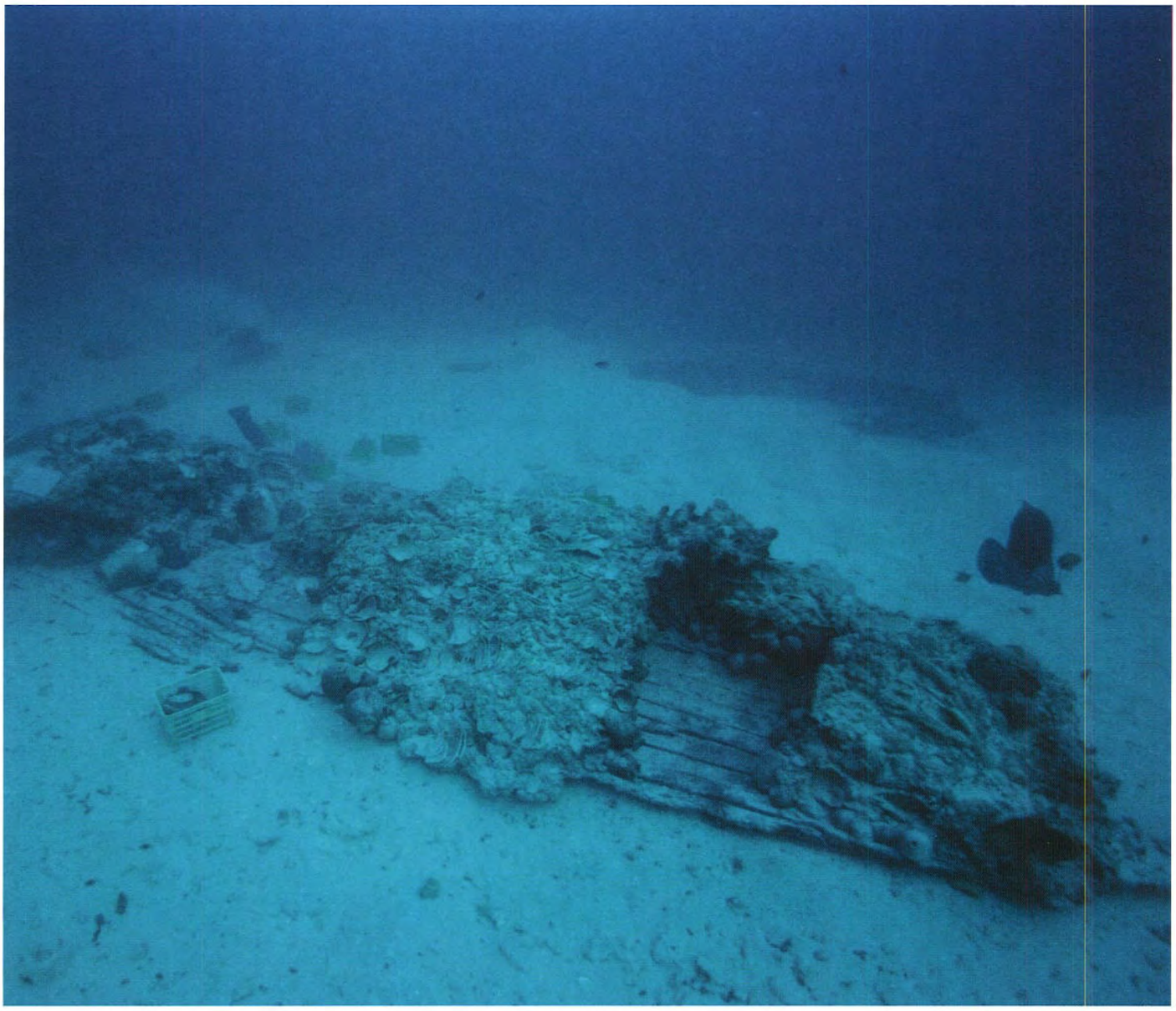

Photo 3. The tumulus of the junk lay at a depth of 48 m.

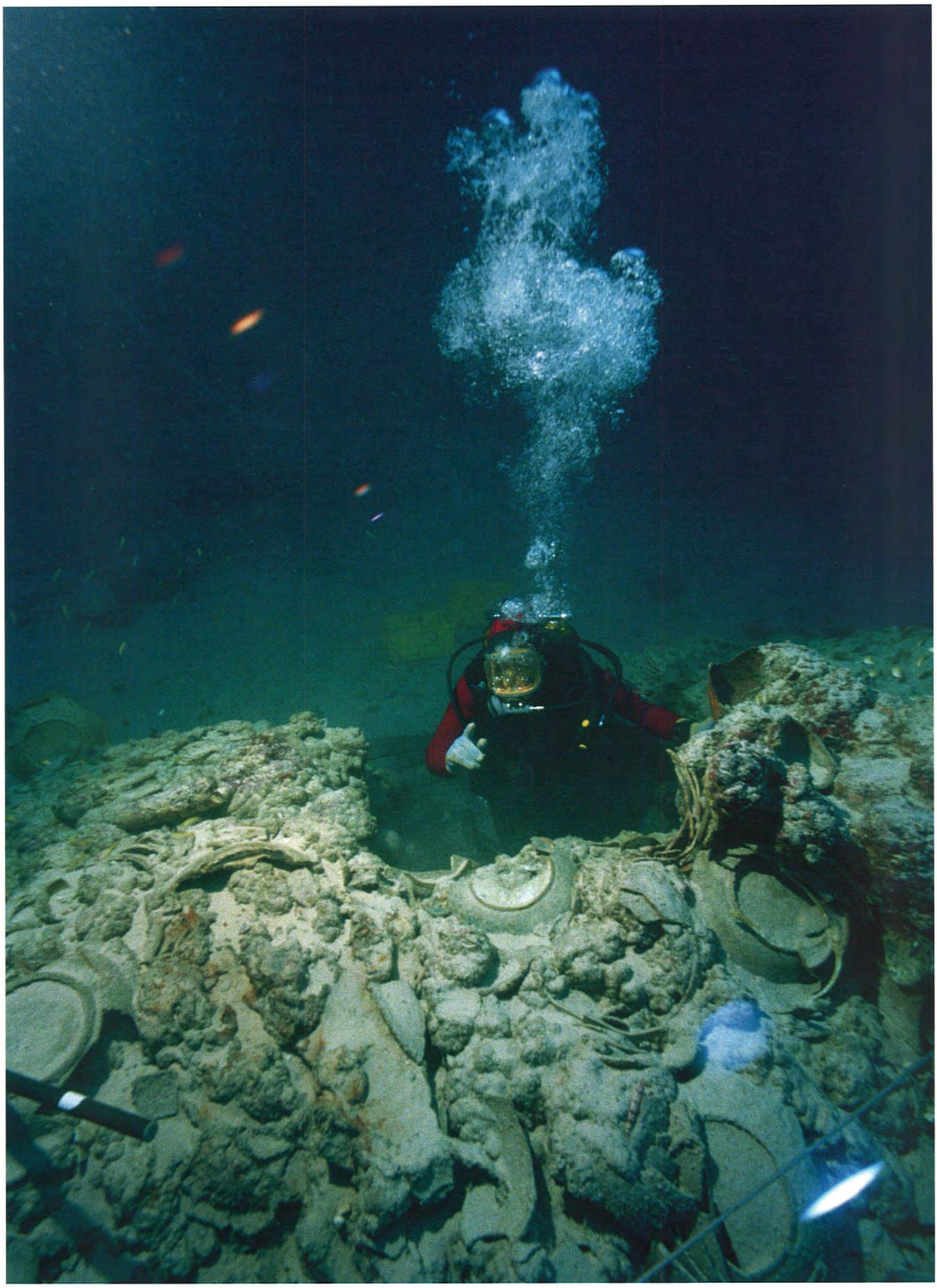

Photo 4. Condition of the site during archaeological excavations.