

The Brunei Shipwreck: A Witness to the International Trade in the China Sea around 1500

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About ten shipwrecks from the years 1480-1520 have been discovered in the last thirty years or so in the South China Sea, but few of them have at the same time been scientifically excavated, escaped illegal treasure hunters and been well published.¹ The Brunei shipwreck is an exception. It was undisturbed since it sank about 500 years ago, has been systematically excavated and its cargo scientifically published. It therefore constitutes documentation of great value.

The discovery and excavation

In May 1997, a wreck, indicated by the presence of ceramics, was discovered 22 nautical miles off Brunei Darussalam by Elf Petroleum Asia during a geophysical survey of the seabed to lay a pipeline [Fig. 1]. The sultanate of Brunei asked the French government to send archaeologists to make a survey of the shipwreck. The task was entrusted to the Department of archaeological sub-aquatic and submarine researches of the French Ministry of Culture, under the direction of Michel L'Hour. In October 1997, the cartography of the site was done during this survey, and, thanks to the retrieved ceramics, the shipwreck was dated between the end of 15th and the beginning of the 16th century (*La Mémoire* 2001, Cahier de fouille, pp. 25-41).

Following the survey report, a salvage excavation was scheduled. The operation lasted two months, from the end of May to the end of July 1998. It was one of the first shipwreck excavations in the region to have only scientific aims and which was not motivated by commercial purposes. The excavation was made very difficult at first by natural conditions. The shipwreck lay at a depth of 63 meters in a volatile mud constantly washed in a turbid sea, which created very poor conditions of visibility. The site is 24 m long and 18 m wide. Moreover the field work had to be conducted quickly first because the risk of looting is so high in the region, and also because of the pressure and conditions laid down by the sponsors of the project, in the first instance TotalFinaElf.



Fig. 1. Map showing locations mentioned in text.



After: *La Mémoire*, Cahier de fouille, p. 75 ; photo 1998: Frédéric Osada.

Fig. 2. A diver.

The team of archaeologists and divers operated from a barge 60 m long, with a control room in the center for two diving supervisors. Two teams of 15 divers each worked during the two months of the excavation. On the fore-part of the barge were the submarines, the crane and the space for sifting. The barge was helped by an auxiliary tugboat and protected by the Bruneian navy. Like-

wise a landing craft of the Bruneian navy came every night to transport the excavated material to the inland workshop. This workshop was a 1000 m² hangar, including two air-conditioned rooms for the persons in charge of processing and drawing the finds, the four ceramic specialists and the photographer's studio.

The archaeologists first laid out on the shipwreck a spatial reference frame of metal grids. Each grid measured 3 square meters and was subdivided into 4 small squares measuring 1.5 m each. It was therefore possible, as the excavation proceeded, to record the exact position of each recovered item and, thanks to data-processing, to record the localization of each object in its surroundings. A ROV (remotely operated vehicle) inspected the grids and made video coverage of the excavation (*La Mémoire* 2001, Cahier de fouille, ch. Journal de bord [M. L'Hour], pp. 43–131). The divers brought the objects up to the surface with the mud around them [Fig. 2].² The silt was then sieved on the barge. All the significant artifacts were thus collected.

Every evening, hundreds of pieces and tens of kilos of shards, excavated the same day, after cleaning and recording, reached the workshop. A team of eight restorers under the direction of Henri Bernard Maugiron controlled the storage and carried out the first conservation and resto-

ration treatments on the most important or fragile pieces. This included the careful removal of marine growths and a desalination process of the ceramics which consists in immersing them in regularly changed fresh water [Fig. 3]. Also in the workshop, every artifact was

Photos 1998 M. Pirazzoli-t'Serstevens.



Fig. 3. Thai stoneware jar Bru 1865, before and after treatment.

catalogued in a computer database and photographed. The ceramics were described and studied, the most typical being drawn (more than 550 drawings were done).³ On the whole, more than 130 specialists participated in the excavation.

All the excavated material stayed in Brunei where it is kept in a special museum. An exhibition was first organized in Brunei with a small catalogue in English published in 2000 (*Catalogue 2000*). Another exhibition took place in Paris in 2001 and was accompanied by a more important catalogue in French.⁴ A documentary for TV was produced in two versions, French (in 1999) and English (2001).⁵

One goal of the excavation was to understand the construction and shape of the junk as well as the organization of the cargo. However, that aim was only partially achieved because no part of the vessel was discovered. This was probably due to the conjunction of currents around the wreck and a muddy seabed. Nevertheless some data were obtained. The hull had a not too sharp V shape. Rocks ballasted the bottom. The maximum width of the hull is estimated between 8 and 11 m for a length between 22 and 25 m (*La Mémoire 2001, Précis scientifique*, p. 145). Bulkheads divided it into several (at least six) storage compartments or holds (*Ibid.*, p. 152). Relying on 16th century Malaysian and Portuguese sources, we can imagine a junk of the kind often found in the Malay sphere, able to carry 350 to 500 tons of goods and a few hundred crew members and merchants (Pierre-Yves Manguin in *Ibid.*, p. 13).

The cargo

Some 13,500 artifacts have been registered, of which at least 70% are intact, making it one of the richest of the South China Sea for the period. The ceramics, with nearly 12,000 pieces, constitute 89% of the finds (*La Mémoire 2001, Précis scientifique*, p. 142). They consist mainly of stoneware, especially jars, and then porcelain.

The stoneware jars represent the largest collection of artifacts recovered from the Brunei shipwreck (Marie-France Dupoizat in *La Mémoire 2001, Précis scientifique*, pp. 85–107). Half of them come from Thailand, a majority from the kilns of Singburi, near Ayutthaya. These are



Photo 1998 M. Pirazzoli-Serstevens

Fig. 4. Chinese stoneware jar Bru 3024.

large and heavy jars with glazes from black to dark chocolate brown [Fig. 3]. The second half comes from South China, medium-sized ovoid jars, thinly potted and decorated with an incised floral motif under a translucent brownish glaze [Fig. 4]. To these two groups, one must add some Vietnamese jars.

These large and small jars were used and re-used for the transport of goods and for everyday life. Quite a lot of ceramics, for example, were exported in jars. Several cargoes show this, among them the Brunei cargo, where several large Thai jars were filled, some of them with Chinese blue and white jarlets, others with small Thai greenware bottles [Fig. 5], still others with Thai bowls

Fig. 5. Small Thai greenware bottles and their jar.



After: *La Mémoire, Précis scientifique*, p. 95; photo 1998; Philippe Sebrot.



Photo 1998 M. Pirazzoli-ŕSerstevens

Fig. 6. Burmese green-glazed dish Bru 2022.

(75 to 80 bowls in a jar). Jars served also for storing fresh water on board, for preserving and fermenting food like fish and vegetables. Finally, gold powder, saltpeter, indigo, camphor, sulfur, and copper were packaged in jars — that is to say, all the commercial products which circulated in that part of the world.

To these daily uses one must add, among some populations of Borneo, ritual functions. In these societies, the imported jars played a part in magical rites, in burial customs and ancestral worship. For that reason

they were treasured as precious heirlooms and transmitted through generations.⁶

We have just seen that, apart from jars, the Thai stoneware in the cargo included bowls, small bottles with celadon glaze. Small globular jars and dishes from the Si Satchanalai kilns were also included. All these pieces are ceramics for daily use. The same can be said of the Burmese green-glazed dishes recovered from the wreck [Fig. 6].⁷ After the Thai stoneware, the most important set in the cargo consists of Chinese porcelain, and above all blue and white porcelain. The major part of the blue and white in the cargo are dishes [Fig. 7], cups and bowls, jarlets (maximum dimension of the body between 7 and 10 cm) [Fig. 8] and some ewers [Fig. 9]. Shapes are limited and dimensions standardized.

Fig. 8. Two Chinese blue and white porcelain jarlets, Bru 1553 and 1645.



Photo 1998 M. Pirazzoli-ŕSerstevens

Fig. 7. Two Chinese blue and white porcelain dishes: left Bru 1351, right Bru 3190.



Photo 1998 M. Pirazzoli-ŕSerstevens



Fig. 9. Drawing of a Chinese blue and white porcelain kendi Bru 1945.

This is not the first quality porcelain made in official kilns, but an ordinary production made in private kilns (*minyao* 民窑) from Jiangxi province, Jingdezhen, but also maybe in several cases Linjiang 臨江 kilns (see *Kaogu xuebao* 1995/2, pp. 243–74, esp. Fig. 18/2, p. 269, similar to Bru 919). This production was for the domestic market as well as for export.⁸ The decoration is typically Chinese, with floral motifs, mythical animals such as qilins [Fig. 10], dragons, phoenix, and Buddhist symbols (such as Chinese lion-dogs playing with the pearl of wisdom). No motif is really intended for Muslim customers. Nevertheless, the cargo's blue and white porcelain is similar to that which litters the site of Kota Batu, the ancient capital of the Brunei Sultanate from 14th to 17th century, even if we also find at Kota Batu high quality pieces (Harrison 1970). I shall come back to the

After *La Mémoire*, Carnet de dessins, p. 10 (drawing by Marie-Noëlle Baudrand); photo 1998; Ph. Sebirot.



Fig. 10. Chinese blue and white porcelain with a decor of qilin, Bru 484.

Photo 1998; M. Pirazzoli-t'Serstevens.

blue and white when dealing with the dating.

The Chinese ceramics in the cargo included also about 1000 celadons or greenware, saucers and large dishes, some of them coming from Guangdong kilns, others from Longquan in Zhejiang. The quality is rather poor (Zhao Bing in *La Mémoire* 2001, *Précis scientifique*, pp. 65–83). Finally the cargo contained less than 200 pieces of white porcelain from Jiangxi province, several originally painted with enamels.

The date of production of the Chinese porcelain in the cargo is very coherent, except for two pieces, one blue and white box (Bru 5275, *La Mémoire*, *Précis scientifique*,



ill. 1.) and one *qingbai* double-gourd ewer (Bru 1943, *La Mémoire*, *Précis scientifique*, ill. 17) [Fig. 11] which could date from the 14th century. It

Fig. 11. Chinese *qingbai* double-gourd, 14th century, Bru 1943.

Photo 1998; M. Pirazzoli-t'Serstevens.

Fig. 12. Vietnamese blue and white jar, Bru 6015.



Photo 1998: Ph. Sebirot.

is difficult to explain their presence here, maybe as old rubbishy goods from a warehouse. It is not the only case. Two 14th century ewers similar to the Brunei one were recovered from the Pandanan cargo (in the Philippines) which is dated ca. 1470 to 1487 (Brown 2009, p. 46).⁹

About ten pieces of Vietnamese blue and white were found in the cargo, mainly jars [Fig. 12], jarlets and boxes. This is a very small number of pieces compared with the Thai or Chinese ceramics and it means that the junk did not put into Vietnam on its way. At the same time it means that ceramics from different regional kilns participated in complex maritime movements including peddling (M.F. Dupoizat in *La Mémoire* 2001, Précis scientifique, p. 123).

The enormous quantity of ceramics on the Brunei shipwreck must not lead us to neglect the other products or artifacts found in the cargo.

Fig. 14. Two glass bracelets (left Bru 3246 and right Bru 3258) and a shell bead (BA 246) in the middle.



Photo 1998 : M. Pirazzoli-t'Serstevens.



After *La Mémoire*, Cahier de fouille, p. 103 (upper part), Photo 1998 : Ph. Sebirot.

Fig. 15. Copper wires in a jar.



Fig. 13. Malaysian tin ingot, Bru 166 P1.



Photos 1998: Ph. Sebirot.

Fig. 16. Earthenware stove, Bru 198.

There are 128 tin ingots [Fig. 13] which are the Malaysian tin-currency of the 15th-16th century.¹⁰ There are numerous stone and glass beads, some of them still stored in their transport jars, glass bracelets [Fig. 14], lumps of raw glass, one shell bead [Fig. 14], brass rods, copper wires [Fig. 15] packaged in jars, elephant tusks, 7 bronze rifle bores (Michel Decker in *La Mémoire* 2001, Précis scientifique, pp. 152-53), about ten gongs, a metallic box and some forty Chinese coins. Finally, the finds include objects of daily use: earthenware stoves [Fig. 16], jar lids, braziers, incense burners,

kendis and cooking pots, and three grindstones. This type of ware, probably made in Thailand, was found consistently on all the shipwrecks in the gulf of Thailand. Some of these utensils are certainly part of the crew's kitchenware, even if they are distributed all over the site, with some found in each hold.

This brings us to the organization of the cargo. Most of the shipwrecks discovered in Southeast Asia, the Brunei wreck no exception, show the hull divided into compartments by partitions. On the trade junks which ploughed the China Sea, it was usual to hire out each compartment to merchants who settled down there with their personal belongings. So they slept and cooked close to or above their own cargo (*La Mémoire* 2001, *Précis scientifique*, p. 166). That would explain the distribution of daily utensils in different compartments of the Brunei ship.

In our case the merchants did not reach the harbour. The reasons for the wreck, on the high seas, are not known. The most plausible one is a storm on a too heavily laden ship, but an attack by pirates cannot be excluded.

When did the ship sink? No inscription giving a date was found in the cargo. There is no blue and white porcelain inscribed with a date or a reign mark, except two pieces marked on the base “Made in the great Ming Dynasty” (e.g., Bru 2807, *La Mémoire*, *Cahier de fouille*, p. 38), which, of course, does not bring a precise date, except that this mark appears on several non-official ceramics at the turn of the 16th century.

In fact, it is the Chinese blue and white porcelain, through stylistic comparisons, which allows us to date the cargo and so the wreck. We know that during the Ming dynasty, with very few exceptions, it was contemporary ceramic productions which were exported. Jars were different since, as I already said, they served as containers and could be reused for a rather long time. What makes dating not so easy is that the porcelain in the cargo consists of ordinary pieces, whereas high quality porcelain is usually well documented and therefore easy to date with precision.

Several Chinese blue and white porcelains from the Brunei cargo are similar to pieces in the Lena Shoal cargo, which was found in 1997 south of Mindoro island (Philippines) (Goddio et al. 2000; also Crick 2001). The Lena junk, whose cargo offers many similarities with the Brunei cargo, was

looted before the excavation. It still totalled over 5,000 items. The Chinese blue and white wares are of better quality than those of Brunei. Stylistic comparisons with pieces in the Topkapi Saray Museum in Istanbul and the Ardebil Shrine collections in Tehran, and with dated pieces in China, place the style of the ceramic cargo at the end of 15th century in the Hongzhi period (1488–1505). What is also interesting with the Lena cargo is that it contains the same range of non-porcelain artifacts as the Brunei cargo: the same tin ingots, copper wires, gongs, earthenware lids, stone disks, grindstones, and also elephant tusks.

Another site whose porcelain is still more similar to that of Brunei is Penny’s Bay (竹篙灣 Chok



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Photo 1998: Ph. Schirot.

Fig. 17. Two Chinese blue and white dishes: on the left from Penny’s Bay 1990:88; on the right from Brunei Bru 8890.

Ko Wan in Cantonese) [Fig. 17]. The site discovered in 1975 at Lantau island, Hong Kong, was perhaps the port where the ceramics were brought from the kilns in mainland China and from which the privately owned ships sailed, that is to say the port of the smuggling trade (Lam 1986/88; 1989/92; 2001). The ceramics excavated there from 1986 to 2002 are considered as contemporaneous or within a very limited time span before and after 1500.¹¹

Apart from these two sites, and similar pieces in Istanbul [Fig. 18, next page] or Tehran, all of them attributed to the late 15th/early 16th century, all the comparisons are with blue and white porcelain discovered in the Philippines and dated from the end of the Hongzhi period or the beginning of the Zhengde reign (1506–21).

So a date around 1500 is the most probable. As Rita Tan has noted, the florid and dense designs



Top after: R. Krahl, *Chinese Ceramics in the Topkapi Saray Museum: A complete catalogue*, vol. 2, London, 1986, p. 554; bottom, photo 1998: Ph. Sebirot.

Fig. 18. Two Chinese blue and white large bowls: top, Topkapi Saray K 699, and bottom, Brunei 1985.

that fill up the entire surface of the vessel, echoing the foreign-inspired Yuan tradition, are a common feature of the group of wares from the end of the Hongzhi-beginning of the Zhengde period (Gotuaco et al. 1997, p. 89). It is also characteristic of many of the blue and white pieces from the Brunei cargo [Figs. 18, 19, 20].

However, some comparisons may indicate a slightly later date, still in the Zhengde reign. The main motif of a lotus on the body of a small blue and white jar, for instance, found in a tomb dated 1517 at Jingdezhen (*Jingdezhen* 1988, no. 85), is quite similar to the same motif on several small jars in Brunei [Fig. 21] (Bru 1494 and Bru 959, *La Mémoire* 2001, Précis scientifique ill. 12, p. 37, and ill. 7, p. 33). Moreover, the moulded monster heads on two Vietnamese blue and white jars (Bru 6015 [Fig. 12] and 6374) are a motif which



Photo 1998: Ph. Sebirot

Fig. 19 (left). Chinese blue and white large bowl Bru 1986.

Fig. 21 (right). Chinese blue and white small jar Bru 959 (with cover Bru 1128).



Photo 1998: M. Pirazzoli-Seris Stevens.

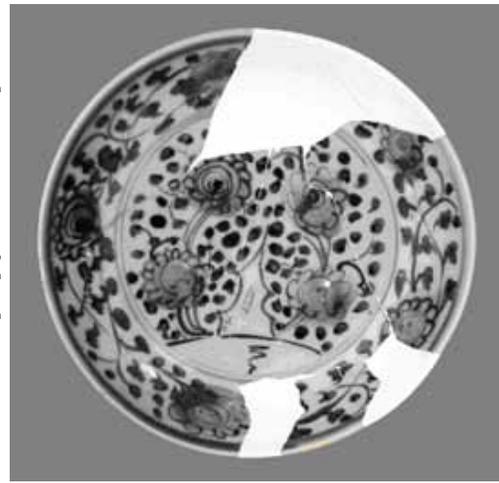


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Fig. 20. Two Chinese blue and white dishes: top Brunei 1691, bottom Penny's Bay PB 1990:98.

apparently does not appear on this kind of jars before the 16th century. At the same time, some



Photo 1998: M. Pirazzoli-Seris Stevens.

Thai productions such as Sawankhalok underglaze black wares which appear around 1520 are absent from the Brunei cargo. We know also that Vietnamese ceramics disappear from regional trade from the end of the Zhengde reign onward.

Two other cargoes, the Santa Cruz junk (Philippines) dated around 1510 and the Ko Samui shipwreck (Thailand), attributed to the Zhengde reign, could help in the future to clarify the dating (on these, see Brown 2009, pp. 146–50, 174). The research on them is still difficult though, because of lack of access to publications which are hard to find. I would favor the period 1500–1510, which moreover coincides with the time (from 1488 to 1520) when there was a real flood of Chinese wares (mainly blue and white) abroad. After about 1520, a period of moderate shortage starts again until the Ming ban on sea trade is officially rescinded in 1567 (*Ibid.*, p. 48).

If the Chinese blue and white porcelain is the best dating tool, other objects in the cargo, more modest in appearance, give information on the route followed by the ship, the areas of exchange and the customers for whom artifacts in the cargo were intended. The tin ingots [Fig. 13] are an example. Each of the 128 ingots weighs around 1.6 kilos, which corresponds to the ancient Perak “bidor” (ingot of 2½ katis). Tin from the Malay peninsula was not only exported as a product but served also as currency for all major transactions (Singh 1986).¹² These blocks were either mound-shaped or shaped into a four-sided pyramid with a flat top and a broad foot or plinth. We find the two types in the Brunei cargo. The large quantity of these ingots in the cargo shows the commercial supremacy of the Melaka (or Malaccan) Empire which was, when the Portuguese conquered it in 1511, the great emporium of the spice trade. Located at the cross-roads of the maritime networks between the Near East and China, it drew the merchant ships from all of Asia, from the Ryukyu islands to the Persian Gulf.

The analysis of the lading (more important on the west part, very probably the stern

of the ship) seems to indicate that the ship was on route to the East, that is to say to Brunei, when she met with disaster (*La Mémoire* 2001, Précis scientifique, p. 151). We can imagine that she came from the Melaka straits after having stopped over in Thailand.

Some goods in the cargo could have been intended for customers from the Borneo hinterlands. When strung together, the colored glass beads were used as elements in necklaces and bracelets but also as currency (Singh 1986, p. 584) and as a status symbol. Many bracelets made from copper wires, like the ones found in the cargo [Fig. 15], were excavated from tombs at the Sungai Lumut site in Brunei (Harrison and Shariffuddin 1969). Very popular also among the inland populations of Borneo were the disks cut up from shell opercula. They were ornaments sewn on fabrics or inlaid on wood [Fig. 22] (see, e.g., Hornbill 1989, fig. 88, p. 125; fig. 124b, p. 139; fig. 205b, p. 171; fig. 241a-b, p. 184; fig. 363, p. 222). The piece found in the shipwreck [Fig. 14] may indicate the presence on board of a member of the crew coming from inland Borneo.

In exchange for these fancy articles, and also for jars and iron utensils, Borneo’s hinterland populations bartered their natural resources, the products of their forests: first and above all the best quality camphor, but also, as far as Brunei is concerned, hardwoods, pepper, beeswax, and tortoise-shells.

The Malaysian sultanates on the coast, especially Brunei, derived a part of their riches from

Fig. 22. Borneo’s Ngaju shaman’s tunic with opercula sewn on. For the shell opercula in Brunei shipwreck, see Fig. 14.

After Hornbill, p. 171.





Photo 1998: M. Pirazzoli-*t*Serstevens.

Fig. 23. Brunei, Kota Batu, tomb of Sultan Bolkiah (1485–1524).

along the river, with the palace on the hilltop, the residential district halfway down the hill and ordinary people's houses further down, around the port [Fig. 25]. Lots of Chinese shards of the same style as those excavated from the shipwreck were found on the site, proof that the population of Kota Batu widely used Chinese ceramics.

Around 1500 the Chinese ceramics had been circulating illegally for more than sixty years,

the part they took in this extremely profitable trade. The end of the 15th and the beginning of the 16th century constitute the golden age of the Brunei Empire, under the reign of the 5th sultan, Sultan Bolkiah (1485–1524). At that time, Brunei controlled a large commercial empire including the Southern Philippines. Many merchants from different countries had settled in the capital, Kota Batu, one of the most prosperous ports-of-trade east of Melaka. An important Chinese community, including craftsmen, was part of this cosmopolitan society. The tomb of Sultan Bolkiah shows that very clearly [Fig. 23]. Built and carved in stone in a style of decoration and with a technique which is typically Ming, it was certainly made by Chinese craftsmen [Fig. 24]. Kota Batu was built in tiers



Photo 1998: M. Pirazzoli-*t*Serstevens.

Fig. 25. Kota Batu, view on the Brunei River and the mangrove swamp.

Fig. 24. A detail of the stone carved decoration of Sultan Bolkiah's tomb.



Photo 1998: M. Pirazzoli-*t*Serstevens.

the Chinese emperors having banned private trade and stopped state trade (*gongbo* 貢舶) with foreign countries (Li 2010). Between 1434 and 1487, the ban was more or less operative, even if a lot of illicit trade went on through the Ryukyu islands. But the smuggling became more and more important over the years, and a lot of Chinese people migrated and settled in Southeast Asia, contributing to the trade and to the hybridization of naval technology (Pierre-Yves Manguin in *La Mémoire* 2001, Précis scientifique, pp. 10–17). At the time when our ship travelled, the Southeast Asian market was flooded with Chinese ceramics, mostly blue and white porcelain.

The ban also benefitted Thai ceramic production, as the Brunei shipwreck shows. Furthermore, we

can imagine that a lot of the small Thai bottles, as well as the Chinese jarlets, shipped empty, were intended to receive contents (aromatics, spices...) before being re-exported to other markets in Asia. Without solving all the problems, the Brunei shipwreck constitutes the only known maritime landmark from the heyday of Brunei commercial activity at the turn of the 16th century. It gives an idea of the very diversified freight dispatched to a sultanate which was the center of the south China Sea trade. It also throws light on the complexity, diversity and vitality of the global networks in that part of the world before the arrival of the Europeans who did no more than graft themselves onto these trading networks.

The French historian Denys Lombard was certainly right when he compared the East Indies sultanates of the 15th–16th centuries, Melaka and Brunei included, to the Italian or Flemish commercial centers of the Renaissance (*Asian Merchants* 2000, pp. 5, 113–20). In both cases, the commercial and the political were combined there in a coherent system.

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Notes

1. The best synthesis on 15th-16th century shipwrecks in the South China Sea is Brown 2009.

2. All the illustrations of Brunei objects come from the Brunei excavation. Dir.: Michel L'Hour (Drassm) and are reproduced here with permission.

3. Anne-Christine Nalin directed the inventory team, Marie-Noëlle Baudrand the drawing pool, Philippe Sebirot the photo studio. The four specialists on ceramics included, with the present author, Hélène Chollet, Marie-France Dupoizat and Zhao Bing. A selection of the drawings made during the excavation is published in *La Mémoire* 2001, Carnet de dessins.

4. The exhibition was held at La Conciergerie, from September 2001 to January 2002. For the catalogue, see *La Mémoire* 2001.

5. Marc Jampolsky, *Le trésor de la jonque engloutie, enquête archéologique au large de Brunei*, 1999 ; *Sultan's Lost Treasure*, Nova, 2001.

6. On the different functions of the jars, see Marie-France Dupoizat, in *La Mémoire* 2001, *Précis scientifique*, pp. 87-97.

7. First considered as Thai, these celadon dishes are now identified as Burmese, from a production site in the Twante area south of Rangoon. See Myo and Rooney 2001; also Brown 2009, pp. 21, 65.

8. The blue and white porcelains in the Brunei cargo are very similar to the ones found in the Daijitun 岱吉屯 tombs at Fuyu, Jilin province, wrongly attributed to the Yuan dynasty. See Zhang 1994 and *Wenwu* 1995. Several blue and white excavated from a paper-making mill at Gao'an 高安 in Jiangxi have their equivalent in the Brunei cargo. These pieces are attributed by

the Chinese archaeologists to the Jingdezhen production of the Zhengde reign. See *Kaogu* 2010, Figs. 30/3 and 31/1.

9. The two pieces are kept in the National Museum, Manila.

10. The identification of these ingots as currency was not understood when the cargo was studied after the excavation.

11. I am grateful to Prof. Peter Lam for having given me his publications on Penny's Bay and shared his great knowledge of the subject; I am also most grateful to Dr. Michael K.S. Tang for having shown me porcelains from Penny's Bay kept in the Antiquities and Monuments Office (古物古蹟辦事處), Government of the Hong Kong Special Administrative Region, and for having sent me images.

12. I am grateful to François Thierry, Curator-in-Chief at the Cabinet des Médailles of the Bibliothèque nationale de France, for having given me access to this book where tin ingots similar to the Brunei ones are identified and annotated. See also Shaw and Kassim 1970.