Okinoshima in Prehistoric and Ancient East Asian Seas: Seafaring, Vessels and Maritime Networks

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The "Sacred Island of Okinoshima and Associated Sites in the Munakata Region" was inscribed as a UNESCO World Heritage Site on July 9, 2017. In the East Asian maritime region, stretching from the coastal zones of mainland Asia including China and the Korean Peninsula, to the Yellow Sea, East China Sea, Tsushima Strait, and the Sea of Japan, rising sea levels that occurred during the late Pleistocene and early Holocene eras resulted in the creation of extensive island seascapes. In parallel with these geological and oceanographic changes, new exchanges of people, goods, and information through vessel-borne voyages came to be realized. This paper aims to shed light on Okinoshima's role and position in the prehistoric and ancient East Asian maritime world of seafaring, vessels, navigational safety rituals, and maritime networks.

Ⅰ. Seafaring and the high seas in the East Asian maritime region

1. Currents and tides

Let us start by considering prehistoric and ancient seafaring in the East Asian maritime region in terms of atmospheric and oceanographic phenomena. The major ocean currents in this region are the Kuroshio Current, which runs from off the coast of Taiwan in a northeastern direction, and the continental coastal currents. The Kuroshio flows to the west of the Ryukyu Islands, diverging south of 30°N, 128°E, and becoming the Yellow Sea Warm Current and the Tsushima Warm Current on the west side (Hishida et al. 1990). The Kuroshio is approximately 100 kilometers wide, with a maximum velocity of 4 knots/hour, and is characterized by high water temperatures and oligotrophic waters. Due to the influence of this current all sea voyages that head southward from Kyushu tend to drift eastward. Prevailing easterly winds are therefore particularly important for sailing vessels to correct this drift.

During the *Kentoshi* era, the period from AD 630-894 when Japanese missions paid visits to Tang Dynasty China, the route taken from Kyushu to China *via* the Ryukyu Islands is known as the "Southern Islands Route," but it would appear that this was not the usual route. Depending on the season, the Kuroshio Countercurrent flows in a circular clockwise direction between the Kuroshio Current and the Ryukyu Islands. Although its velocity (0.6 knots/hour) does not match that of the Kuroshio Current, it becomes apparent in the spring, and could have been the current that was followed on the "Southern Islands Route" (Uchiyama et al. 2016).

The existence of other currents should also be noted, namely the Goto Countercurrent, which flows southward off the east coast of the Goto Islands to the west of Kyushu, and moving southward, the Koshiki southerly current, off the coast of the Koshiki Islands.

The Nihon Shoki (The Chronicles of Japan; Vol. 25, AD 645-654) recounts an event where in the fourth year of Hakuchi (AD 653), during the second mission to Tang Dynasty China, the second vessel of the mission (with 120 crew and passengers aboard) went adrift and capsized, and only five of the people on board washed ashore on Takeshima Island in the Osumi Island chain of southern Kyushu. It is recorded that these people made a bamboo raft using bamboo growing on the island (*Pleioblastus linearis*) and managed to escape and return to Kyoto. This would suggest that the crew of the shipwrecked vessel were carried on this current.

The Yellow Sea, on the other hand, is located in the area north of the line connecting the mouth of the Yangtze

River and Jeju Island and south of the line connecting the northern tip of the Shandong Peninsula and the southern edge of the Liaodong Peninsula.

After diverging from the Kuroshio Current, the Yellow Sea Warm Current flows northward through the Yellow Sea and the Bohai Sea. This maritime region corresponds to the "North Route" taken by the *Kentoshi* era envoy vessels (Fig. 3). From the bay of the Bohai Sea, the current flows southward, following the Chinese mainland as the Yellow Sea Coastal Current. Along the way this Yellow Sea Coastal Current then intersects with the coastal brackish water zones of the Yangtze River. South of the Yangtze River, the Zejiang-Fujian Coastal Current flows in a southerly direction (Yanguang Dou et al. 2016). Documented cases of envoy vessels returning from Mingzhou in China to Japan drifting down to Annam (Vietnam) would suggest that these vessels drifted on the Zejiang-Fujian Coastal Current.

The Tsushima Warm Current is a branched flow of the Kuroshio Current, which has one-tenth the flow and one-quarter the speed (0.5 to 1.0 knots) of the main current, and its power reaches a minimum in March and maximum in December. It flows through the Sea of Japan, where it reverses north of 40°N latitude, becoming the Liman Cold Current, which flows southward along the coastal areas of Russia, North Korea and the Korean Peninsula.

The Liman Cold Current is also closely related to the voyage routes of the Balhae (Bohai) and *Kentoshi* envoys. A detached bone harpoon head excavated from the Saka shell mound Jomon site on Tsushima may have been used to hunt sea animals, but detached bone harpoons were originally a type of fishing equipment typically found in Hokkaido and Tohoku, which would suggest that northern hunters or fishers may have journeyed southwards to Tsushima, riding the Liman Cold Current (Nagatome 1997; Masaki 2008).

According to the FRA-AORI Tsushima Warm Current Observatory (FATO) Project, a joint research project implemented by the Atmosphere and Ocean Research Institute, The University of Tokyo (AORI), and the Japan Fisheries Research and Education Agency (FRA), although the coastal current of Tsushima Warm Current is marked between Kyushu and the Oki Islands, no marked coastal current is found beyond Oki. Although both Offshore Northern and Southern Currents converge around the Tsugaru Strait, currents fluctuate largely between coastal and offshore zones. Only the Subarctic Front Current flows northward to the northern reaches of Hokkaido. The Offshore Northern Current reaches from the southeastern part of the Korean Peninsula to the Tsugaru Peninsula according to the flow path average recorded over the course of the past 25 years. In the Sea of Japan, these currents are thought to have had a significant impact, not only on voyages along the Japanese coast, but also on transoceanic voyages (transoceanic routes of the *Kentoshi* era envoy vessels to Tang Dynasty China, and vessels of Silla, as well as trans-Japan Sea routes of Balhae envoy vessels).

Next, let us consider tides. The southwestern and southern coastal regions of Korea stretching from Jeollanam-do Province to Gyeongsangnam-do Province are dotted with many islands and are known as being difficult to navigate due to rapid tides, and marked tidal level fluctuations. In the Tsushima Strait region, the rising tide flows from northeast to southwest while the retreating tide flows from southwest to northeast and the strongest currents appear three to four hours after high tide in the northeast current, and three to four hours after ebb tide in the southwest current (Inoue, Miida, and Tawara 1985: 922-923). The maximum tidal velocity is 1.4 to 3.0 knots per hour for the northeast current (ebb tide) and 0.7-1.7 knots per hour for the southwest current (high tide). The velocity of the tidal current is influenced by the Tsushima Warm Current, which makes the ebb tide faster than the high tide. (Yoshikawa et al. 2006).

2. Winds

Winds also have a critical impact on maritime navigation. In the Genkai Sea region between the Korean Peninsula

and Kyushu, the northwesterly monsoon prevails during the winter season (November to February), while between spring to autumn (March to October) wind directions are not constant, but fluctuate, with southwesterly, south and southeasterly being more prevalent.

In the prehistoric and ancient voyages made by oar and by sail, seasonal changes in wind direction were critical factors in deciding the timing of such voyages. Although there are few extant documents pertaining to the voyages made during the *Kenzuishi* (Japanese missions to Sui Dynasty China) and the *Kentoshi* (missions to Tang Dynasty China) eras, those that do survive provide some information about the timing of voyages and relevant wind directions. In terms of the outward journey to China, journeys were made in: July (once, S wind), August (five times, SE to ESE winds), and October (once, NNE winds). As for the return journeys, these were made in: May (once, gentle S winds), June (twice, gentle SE to ESE winds), August (once), September (once, NE winds), October (once), November (once, NNW to N winds), and December (three times, NNW winds). We do not see clear seasonal changes in these records.

In the East China Sea, it is generally the case that southerly and southeasterly winds prevail during the summer season, while in the winter season, northwesterly/north-northwesterly to north-northeasterly winds are dominant (Mozai 1987: 32-40; Ueda 2007: 275-287). The voyages of the *Kentoshi* vessels were seasonal, with the outward journey considered as having taken place in summer, and the homeward journey in winter (Ueda 2007; Honma 1976). However, homeward winter voyages would have been dangerous due to the strong monsoon winds, while voyages in summer would also have been problematic due to low pressure fronts during the rainy season and encounters with typhoons in the fall (Mozai 1987: 39-40).

In prehistoric and ancient voyages, it would most likely have been common practice to wait tentatively from a few days to a few weeks for the wind direction to change. Later, in the pre-modern Edo period, there were many ports along the coasts of the Sea of Japan and Seto Inland Sea where *Kitamae-bune* vessels would lay anchor, waiting for good winds, which were known as *kazemachiko* (wind-waiting ports). It is likely that similar practices were employed in prehistoric and ancient times. For example, Fukura port (present-day Shika Town, Hakui-gun, Ishikawa Prefecture), located on the Noto Peninsula facing the Sea of Japan was an important international port between Balhae and Japan during the Nara period, where envoys from Balhae would make landfall, stay and repair their vessels, before returning to Balhae. Fukura was also a port of call for the *Kitamae-bune* of the Edo Period, and a large stone compass for seafarers that was donated to the port in 1847 still remains to this day (Kitami 1986: 243-258). Many wind-waiting ports had promontories, known as *hiyoriyama*, which literally means a "mountain to predict the weather," from where seafarers could look into the distance to predict wind and weather conditions. In the early modern era, there were many such *hiyoriyama* at ports along the western and eastern shipping routes linking Edo (Tokyo) with Osaka. Along the western route there were 38 and along the eastern route there were 40, with some having elevations as high as 100 meters (Namba 1988).

3. Seafaring and astrology and biology

There are two distinct types of seafaring techniques; *jinori* and *okinori* (Kitami 1986: 233-243). The first *jinori*, which literally means "land-based voyage," is based on triangulation, namely identifying the location at sea by cross-checking in two directions using near and distant landmarks. This technique is well-known as *yamatate* (*yamaate*) in Japan (Yanagida and Kurata 1975). In this technique when land masses and islands are used for triangulation, high mountains as well as high islands can be used as landmarks. In the East Asian region, such islands as Okinoshima, Oshima, and Genkaijima in Japan, and Ulleungdo, Jejudo, Wando, Geojedo and Jindo could have been used for such purposes. In actual fact, from the summits of Mt. Tsushimamiyama (243 meters) in Fukutsu

City it is possible to see Okinoshima, Iki, and Tsushima islands. From the summit of Mt. Senbyomakiyama (287 meters), Busan and Geojedo are clearly visible, and from Tsutsu at the southern tip of Tsushima Island (ca. 69 meters), Iki Island and Azuchi-Oshima can be observed.

The other seafaring technique is *okinori*, which literally means "seafaring offshore," including techniques to calculate location at sea by observing astronomical, atmospheric and oceanographic phenomena, such as the sun, moon, stars, and clouds, as well as behaviors of fish and seabirds. During the daytime, it is possible to gain a general idea of an east-west direction by following the rising and setting of the sun. Of course, in temperate zones, the sun's rising and setting direction deviates depending on the season. At nighttime, stars and constellations are a useful means of calculating direction and bearing. *Polaris*, the North Star, was utilized widely as it does not move by season. *Ursa Major* is another constellation that was widely used for navigation. For example, in Japan, the three stars that form the "handle" of the "plough" in *Ursa Major* were called *kajiboshi* (rudder stars) and the four stars that form the square were called *funaboshi* (seacraft stars), and these were used by seafarers and fishers (Goto 2017) (Fig. 1).

In the East Asian maritime region, the streaked shearwater (*Calonectris leucomelas*), a migratory sea bird, visits Japan and Korea from the southern hemisphere for breeding in February and March. After the breeding season is over, they return south between November and December. They feed on small fish such as Japanese anchovy, krill, and squid, and after feeding return to their nesting sites at precise times, and possess extremely precise flight capabilities. They also have a habit of feeding in very large flocks. Local fishermen of the Munakata region call this bird *ogachi*, and follow the flocks in search of schools of fish. In Japan, Okinoshima in the Genkai Sea is the largest breeding ground for these birds, and has been protected due to its sacred status. The situation is the same for Kanmurijima in Wakasa Bay. In Korea, there is a large nesting site on Sacheon-do in the southwest of the Korean Peninsula. In prehistoric and ancient times, this bird is thought to have been used as an important sign for locating Okinoshima.

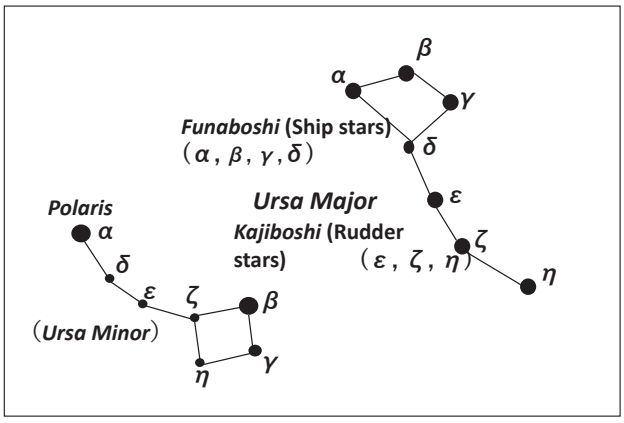

Fig. 1 : *Polaris* and *Ursa Major*

Ⅱ. Vessels and seafaring in East Asia

1. Rafts

In the course of the spread of humans from island Southeast Asia to Oceania in the late Pleistocene and early Holocene periods, people were inevitably required to make ocean crossings. Although there is no extant archaeological evidence to confirm that humans used seagoing craft, it has been hypothesized that bamboo rafts made by lashing thick bamboo poles together might have been used. The technique of burning logs and then using lithic and shell as axes/adze tools to carve out dugout canoes is thought to have been developed around 8,000 years ago or thereafter.

In East Asia, rafts are considered to have been used since antiquity in rivers and lakes, before the invention of dugout canoes (Deguchi 1992, 1995; Akimichi 2019). Although a later example, the Amis people of southern Taiwan are known to have used bamboo rafts fitted out with sails. (Liu and Gao eds. 2015). In Sagominato, located on the northwestern coast of Tsushima Island, log rafts were used for seaweed harvesting, and it is thought that this style of log raft may have been introduced from the southern Korean Peninsula, Ulleung-do, or Jeju-

do. Even in Sou, located on the Echizen coast of Fukui Prefecture (present day Echizen-cho, Nyu-gun), some 750 kilometers east of Tsushima Island, log rafts were used for harvesting seaweed, which may indicate that these log rafts were transported by the Tsushima Current into the Sea of Japan, where they found their way to the Echizen coast (Deguchi 1995).

2. Dugout Canoe

The origin of dugout canoe making technology is considered to date back as far as 8,000 years before present (BP), and is a technique that employed fire and lithic tools. In Japan, the earliest example of a dugout canoe was excavated from the Kaminarishita site in Ichikawa City, Chiba Prefecture, and dates back to 7,500 BP. On the Korean Peninsula there are examples that date back further at the Jukbyeon site (BP 8,000) and Bibonri site (BP 7,700), while in China, excavated remains from the Kuà Hú Qiáo site (BP 8,000) and Hemudu site (BP 7,000) are known (Akimichi 2012; Li 2014).

It is important to note that a dugout canoe is not always constructed from a single log, with dugout canoes having been found that were made from multiple pieces of lumber joined together. In Japan, five examples of dugout canoes made using multiple pieces of lumber have been excavated. For example, the dugout canoe found in 1838 in Morokuwa Village, Kaito County, Owari Province (present day Morokuwa-cho, Aisai, Aichi Prefecture) used four camphorwood trunks, which were joined together as the bow, two trunks and the stern (Adachi 2016).

Materials used for dugout canoes vary: *mukunoki* (*Aphananthe aspera*) at the Kaminarishita site, *sugi* (*Cryptomeria japonica*) at the Shimane University campus site, chinaberry (*Melia azedarach*) at the Ikiriki site, pine tree (*Pinus* sp.) at the Bibonri site, Masson's pine (*Pinus massoniana*) at the Kuà Hú Qiáo site, and camphor tree (*Cinnamomum camphora*) at the Jukbyeon site. In general, in the Seto Inland Sea region, along the Pacific coast, and in the Ryukyu Islands, camphor was commonly used, while conifers such as *sugi* and *hiba* (*Thujopsis* spp.) are thought to have been utilized where camphor trees did not grow. Camphor trees have a thick trunk, but do not grow upright. On the other hand, the long straight trunks of conifer trees lend themselves to use as dugout canoes.

Throughout the Kyushu region, including on Tsushima Island, the camphor tree is naturally distributed. Immense camphor trees in shrine precincts on Tsushima Island have been preserved as sacred trees in which deities dwell. In addition, although camphor trees were thought to not be distributed naturally on the Korean Peninsula, with the exception of Jeju-do where a dwarf species has been confirmed, a dugout canoe, excavated from the Jukbyeon site in Uljin County, which lies up the eastern coast of the Peninsula, was made of camphor while the paddle was made of sawtooth oak (*Quercus acutissima*). The possibility should probably also be considered that past climate change phenomena may have affected the vegetation.

One aspect of dugout canoe making technology that bears further attention is the *marunomi sekifu* of the Jomon period. In Kagoshima in southern Kyushu, including Tanegashima Island, unique polished stone implements have been excavated from early Jomon sites that have a chisel-like edge, or *marunomi sekifu*. As mentioned above, a dugout canoe was found at the Ikiriki site, which is considered to date back some 6,000 years. In addition, Sobata type Jomon earthenware pottery, which were first excavated at Sobata shell mound site at Udo in Kumamoto Prefecture, have been found extensively not only in Kumamoto and Kagoshima Prefectures in Kyushu, but also on the Amami and Okinawa Islands to the south, and a similar style of pottery has also been excavated from Tonsamdong shell midden site in Busan, southeastern Korea. This would suggest that in the early Jomon period, extensive inter-island interactions were occurring across a wide area, ranging from the Ryukyu Islands to western Kyushu and the southern Korean Peninsula. This would therefore overturn conventional

wisdom that voyages on the open ocean could not have been made in dugout canoes.

On a related note, abundant bones of Japanese sea lion (*Zalophus japonicus*) have been found at the Shamushomae site on Okinoshima, which date from the early Jomon period. As Japanese sea lions were known to come ashore to breed, they could be easily caught along the shoreline. It is possible that people who came to Okinoshima from Kyushu or the Korean Peninsula by dugout canoe or raft used for such purposes (Masaki 2008).

In addition, there are archaeological evidences to suggest the existence of maritime networks between the southern Korean Peninsula, Tsushima Island, and northern Kyushu in the Jomon period. One such piece of evidence is that the same type of compound bone hooks have been discovered at coastal sites on the southern Korean Peninsula and Tsushima Island. Furthermore, obsidian from Mt. Koshidake, Saga Prefecture, has been excavated not only from sites in Kyushu, but also from the Tonsamdong site in Busan. This tangible archaeological record provides clear evidence that the Jomon period Genkai Sea was a region for transoceanic exchanges and interactions between the southern Korean Peninsula, Tsushima and northern Kyushu, including Okinoshima.

3. From dugout canoe to semi-structured vessel

Semi-structured vessels in which the broadside boards are joined with lower dugout hull, and anti-water splashing boards are joined at the bow, were constructed predominantly in the coastal regions of the Seto Inland Sea from around the middle of the Yayoi period. This type of vessel is depicted in plate drawings from the Yayoi and Kofun periods (Aoya-kamijichi site, Tottori Prefecture, and Hakaza site, Hyogo Prefecture), and the *funagata haniwa* or clay images of vessels from the Kofun period (Nagahara-Takamagari No. 2, Osaka Prefecture, and Saitobaru No.170, Miyazaki Prefecture).

Semi-structured vessels are classified into four types, based on the height, width, and joining methods of both edges of the broadside board, or the presence/absence of fixing nuts and plates on both sides of the broadside board. Three has also been a proposal that the total length of semi-structured vessels should be similarly classified into four types, according to total length; below seven meters, seven to nine meters, nine to twelve meters, and above twelve meters (Shibata 2013, 2020).

4. From semi-structured vessel to structured vessel

In the process of development from semi-structured to structured vessel, there are two distinct types of joining techniques; *tana-ita* (side-board) type and *omoki* (L-shaped joint board). In the *tana-ita* type, the bottom plates are joined to make the overall length of vessel longer, onto which *tana-ita* are joined. In the *omoki* type, a few bottom plates are joined together, with an L-shaped plate, or *omoki* being joined on the outer edge of the base, onto which the broadside boards are attached (Ishii 1995a, 1995b; Deguchi 1995) (Fig. 2). These two construction techniques are technically distinct, and their distribution is consequently different.

On the Korean Peninsula, there is a vessel construction technique similar to the Japanese *omoki* type, where boards are split into two halves, right and left, and then joined. For example, a small vessel, excavated from Anapji, Gyeongju, which has been dated to the United Silla period (AD 677-935), was composed of three parts; a bottom part of a dugout canoe being cut into the right and left halves, between which a third long board is joined so as to extend the width. The hull structure of Korean wooden vessels is similar to that of vessels built in the *omoki* style. Another case is that of a sunken vessel

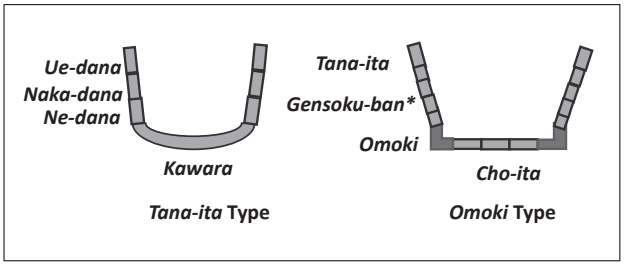

Fig. 2 : Two Types of Semi-structured vessel. *Broadside board.

found at a depth of ten meters in 1984, offshore of the island of Joyak-do, Wando County, Jeollanam-do. The bottom section is composed of five long boards fastened using wooden nails in holes that run through both sides, and the outer sides of the bottom boards are joined using L-shaped boards in the same way as the *omoki* style. The upper side of the L-shaped boards is joined to broadside boards, fixed using wooden nails. Given the characteristics of the cargo of this vessel, which included such items as celadon, ceramic pots, chopsticks and spoons, the vessel is considered to be an eleventh century trading vessel from the early Goryeo period. A third example is also that of a sunken vessel, found in 1995 off the coast of Dalido, Mokpo city, which is thought to be about two centuries later than the one found offshore at Wando. Although the joined wooden boards are not L-shaped in this case, the joining technique between the bottom and the broadside boards is similar (Adachi 2016).

5. Envoy vessels

No excavated materials pertaining to envoy ships have been found that are later than the Asuka period (AD 593-710). According to research based on historical documents, including post-Kamakura-period paintings (post-1492), and shipwrecks from the Song and Yuan dynasties of China (off the coast of Sinan and Quanzhou), the *Kentoshi-sen* or envoy vessels are considered to be similar to Chinese junk-type ships, which are box-like with a flat bottom and upright broadside boards, and two masts for sailing. The technique for structured vessels as mentioned above, where the flat bottom is joined using the *omoki* technique, and to which broadside boards are attached, is considered to be the result of the influence of Baekje seafaring and construction traditions.

The Nihon Shoki (Chronicles of Japan) describes how in the first year of Hakuchi (AD 650), three persons—Agata, Yamato no Aya no Atahe; Abumi, Shiragabe no Muraji; and Agura, Naniha no Kishi—were sent to the province of Aki to build two Baekje vessels (*Kudara no tsumi*; which literally means “large vessel of Kudara (Baekje)”).

It may be the case that these two vessels were the ones used as the envoy vessels in the second *Kentoshi* mission to Tang dynasty China in the fourth year of Hakuchi (AD 653). However, as the two envoy vessels were very large, reportedly accommodating crew and passengers of 121 and 120, respectively, there are questions about whether a mid-seventh century Baekje vessel would have been large enough to accommodate 120 people.

The last four envoy vessels to embark on a mission to Tang dynasty China departed in the summer of AD 838. Unfortunately, the third envoy vessel foundered off the coast of Tsushima Island, but the remaining three envoy vessels safely crossed the East China Sea *via* the South Route, arriving at the Yangtze Delta of China.

On their return voyage from China in AD 839, the first and the fourth vessels departed from Chuzhou, Jiangsu Province, and the second vessel from Haizhou, Jiangsu Province, aiming to take the Northern Route back to Japan, but the second vessel went adrift, washing ashore on southern islands, with the crew splitting into two smaller vessels, which barely made it back to Ohsumi in southern Kyushu. The remaining two ships chartered nine Silla ships at Chuzhou and returned to Ikitsuki, northwestern Kyushu. The 280 crew and passengers in the two envoy vessels were divided into nine Silla vessels, meaning that approximately 30 people were aboard each Silla vessel, which were medium-sized and had a lower waterline than the envoy vessels. Overall, there were five sea routes use during the *Kentoshi* envoy voyages (Bohai Route, North Route, Yellow Sea Route, South Route, and South Islands Route; Fig. 3).

In actual fact, Silla vessels were constructed and used at Dazaifu in northern Kyushu in the early Heian period, which is documented in the *Shoku-Nihon-Koki*, which states that in the sixth year of Jowa (AD 839), a Silla ship was ordered to be constructed, which would be durable to winds and waves. This passage suggests that it was known and accepted that Silla vessels were more likely to

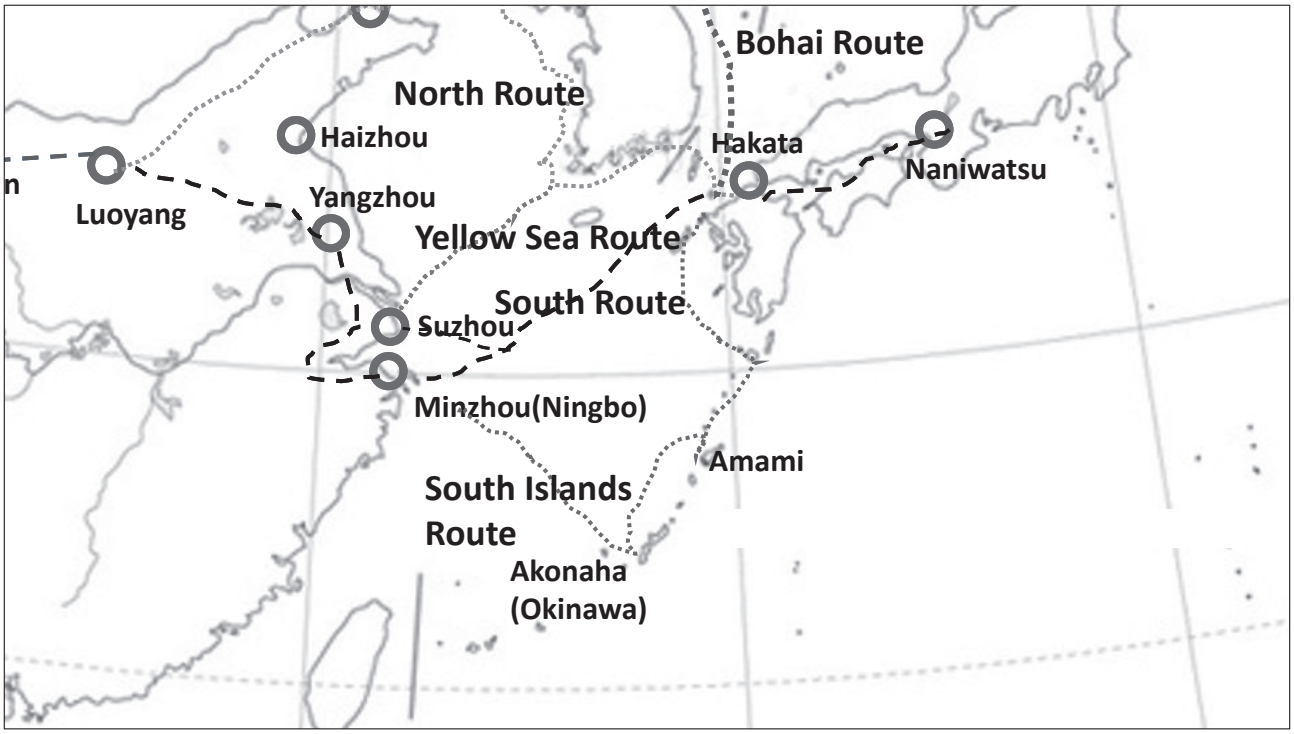

Fig. 3 : Sea Routes of the *Kentoshi* envoy voyages. The Yellow Sea route was used in 653 and 659 AD.

be wave resistant than Japanese vessels.

Kentoshi envoy vessels were thought to have been about 30 meters long, eight meters wide, with 300 tons of displacement, and a 150-ton cargo capacity, with 120 to 150 crews and passengers on board (Ishii 1983, 1995a; Mozai 1987).

In terms of factors that may have contributed to the wrecking and stranding of the *Kentoshi* envoy vessels, strandings immediately after departure may have been due to heavy loading and the low waterline of the vessels. When on the open ocean the flat-bottomed vessels were particularly vulnerable to side waves, with poor propulsion and steering capacity in heavy seas, and the absence of a keel also impacting stability. There might also have been a lack of water tightness between the deck and hold, in addition to which there is a possibility that the joints linking all parts were not properly joined, such as between the base of the vessel and the broadside boards, and the stern, bow and hull sections.

From the historical records of vessels that drifted to Japan, it has been hypothesized that Chinese junk-style vessels were of a structured type. For instance, according to a description in volume 35 of the *Nihon-Sandai-Jitsuroku* (Authentic historical documents consisting of 50 volumes compiled by the Japanese government during the Heian period), on March 13, AD 879, a foreign vessel washed ashore at Takeno-gun, Tango Province (present-day northern Kyoto Prefecture, facing the Sea of Japan), which was recorded as being 18 meters long and 4.5 meters wide. In volume 37 of the same document, two vessels, one sunken and one washed ashore were recorded on May 17 and May 19, AD 880, respectively, one off the coast of Futakata-gun and one off Mikumi-gun, both in Tajima Province. The former was recorded as being 30 meters long, with width unknown, and the latter was given as being over 15 meters long and 4.8 meters wide. Given the large size of these vessels it is assumed that they were manufactured using structured vessel techniques (Mozai 1987: 26).


Fig. 4 : Horse-shaped steatite object (left) and Boat-shaped steatite object (right). (Munakata Taisha, Shimpokan Collection)
Steatite ($Mg_3Si_4O_{10}(OH)_2$ is easy to process. Boat-shaped steatite object have been excavated not only on Okinoshima, but also at the Mitake-san site of Oshima and Shimotakamiya site at Munakata Taisha.

Ⅲ. Seafaring, seacraft and rituals for the safe navigation

It has been noted that rituals praying for the safe navigation underwent a transformation over a period of approximately 500 years from the mid-fifth to late tenth centuries, transitioning from being rituals conducted on the rocks, to rituals on sheltered rock sites, to semi-sheltered rock sites and eventually at open terrace sites. A vast amount of ritual objects, offerings, and sacred treasures have been unearthed, amounting to more than 80,000 items in total, which are registered as national treasures and have various symbolic meaning.

1. Offerings and ritual objects

It is worth noting here that from the sixth to seventh centuries onwards, the number of ritual objects made for the purpose of safety of navigation increased in number. Prior to that time, most offerings were similar to the grave goods placed in kofun burial mounds (e.g., mirrors, comma-shaped beads [*magatama*], and iron swords).

This period of transition corresponds to the timing of the transfer of rituals from sheltered rock sites (Site No. 22), and semi-sheltered rock sites and semi-open terrace sites (Site No. 5) to the open-terrace sites (Site No. 1) that succeeded earlier sites in the eighth and nineth centuries. For example, inventories of excavations from this period include such items as a gold copper model loom, a Japanese model harp (*koto*), earthenware pottery for ritual use, and Human-shaped steatite objects as well as horse-shaped steatite objects and boat-shaped steatite objects (Fig. 4).

Boat-shaped steatite objects (*funagata*) among these items include depictions not only of simple dugout canoes, but also vessels with a bow and stern. More than 100 horse-shaped steatite objects have also been found, including horses with saddles and those without. These are thought to signify the “sacred horse” on which the deity rides. There is a ritual related to a horse at Kifune shrine in Kyoto, in which black horses are dedicated for inducing rains to come, while white and red horses are offered to bring an end to rain. However, in the Okinoshima context, these horse miniatures that were made as offerings were likely not related to prayers for an abundant harvest, but rather offered to pray for good weather or a prolonged rainy season. It is also believed that the human-shaped steatite objects were the most important ritual offering to the deity. Steatite stone is easily polished and one of the softest stones, making it easy to work with. Boat-shaped steatite objects made of steatite stone have been excavated not only from Okinoshima, but also from the Mitake-san

site on Oshima, and the Shimotakamiya Site of Munakata Taisha, both of which are part of the World Heritage property.

There is archaeological evidence in Okinoshima that rituals for safety of navigation were practiced at an even earlier time prior to becoming a national ritual practice. For example, a bronze dagger axe was excavated on Okinoshima, which dates to the mid-Yayoi period. A similar type of slim bronze dagger axe (without its blade tip) thought to be from the same era was found at the Kapo-dong site, Masanhappo, Changwon city, Gyeongsangnam-do in southern Korea. Interestingly, in both cases the bronze daggers were found having been thrusted into the rocks. The Kapo-dong site is located at a river mouth, facing Masan Bay, and it is plausible that rituals praying for safety of navigation might have been conducted in a similar way to those on Okinoshima (Takesue 2011). Besides the Kapo-dong site, a bronze dagger axe also been excavated from the Kyodong-ri site No. 1, Ulsan City, facing the Sea of Japan, which would suggest that rituals for safety of navigation were already being extensively carried out during the Yayoi period in the East Asian maritime context. Bronze dagger axes were at the time regarded as being the source of authority and power, and it is thought that it would have been customary to offer such a ritual weapon to pray for safe passage.

2. Bone divination, ship spirits, and ship ranks

The next point on which to focus is the practice of bone divination, conducted in the Yayoi and Kofun periods, where the scapulae and mandibles of deer and wild boar were first burned and the cracks in the burned bones then examined for portents. In Kyushu, Harunotsuji and Karakami sites on Iki Island, and the Mutayori site in Saga city provide evidence of bone divination during the mid-Yayoi period (Kokubu 2014). From a similar era, an accumulation of burnt bones used for divination purposes have been excavated in southern Korea, at the Nuku-do site, Sacheon City, Gyeonsangnam-do. Given that Nuk-do was an international port at the time of the bone divination practices, it is considered to be the origin of bone divination practices in Wa (Japan) (Kim 2002).

More than 80 pieces of burned bones were excavated from the Gungok-ri shell mound site, Haenam County, Jeollanam-do, which prior to the Nuk-do site is the site with the most numerous excavated remains (Mokpo University 1987; Watanabe 1995). In Japan, the Aoya-kamijichi site in Tottori Prefecture is known as the Yayoi period site where most burned bones have been excavated. These bone remains date back to the second century BC and are similar in age to those found in the Gangmun-dong site, Gangneung City, Gangwon-do, northeastern Korea. It has been suggested that the Korean Peninsula and western Japan was culturally inter-related through ritual practices that were shared across the Sea of Japan (Kitaura 2002). It should be noted that bone divination practices in coastal areas were most likely conducted not for agricultural purposes, but rather for divining the safety of a voyage and the likelihood of good weather (Kim 2002; Watanabe 1995, 2002). Bone divination probably therefore took place prior to an ocean voyage.

A second point of note with regard to safety of navigation is the offering of prayers to “ship spirits” or *funadama*. The practice of offering prayers to the *funadama* as an object of worship for safety of navigation was possibly the precursor to belief in the Three Female Deities of Munakata. For example, the *Shoku-Nihongi* historical document records on August 12, AD 763, how in the previous year of AD 762 an envoy ship from Balhae had encountered a storm, and after landing safely in Noto Province offered prayers for a safe return to Balhae. It is likely that the *funadama* spirit was considered as a sea goddess, revered in folk beliefs for being the deity that had control over safety of navigation. In beliefs relating to *funadama* there are still customs of placing dolls, coins, the hair of the navigator’s sisters, or harvested grains at the bottom of the vessel’s mast or in the engine room in order to dispel evil spirits and protect the vessel.

The use of women's hair as a kind of protection in nautical safety rituals is common to the *Onari* beliefs of Okinawa and also the *Mazu* beliefs of South China and Taiwan.

Another point concerning belief in rituals for safety of navigation is that the vessels themselves were given positions of rank. For instance, owing to the successful round-trip voyage of the *Kentoshi* mission headed by Awata Makoto, on February 22, AD 706 the rank of *Jugoi-no-ge* was conferred on the vessel. (*Jugoi-no-ge* corresponds to the rank of a human nobleman in the Heian period). A similar case was described in documents that relate how in AD 754 two vessels having returned safely back to Japan with Kanshin on board, famous as the founder of Risshu Buddhism, were also granted the rank of *Jugoi-no-ge*. Similarly, in AD 763 in Noto Province a Balhae envoy vessel was awarded the rank of *Jugoi-no-ge* and a crown for safely completing the transoceanic voyage. These cases indicate that rituals directly related to safety of navigation were performed on the ship itself, which is closely related to the safety of navigation rituals conducted on Okinoshima.

In addition to the above rituals, a final ritual is one of sacrifice while at sea. The evidence for such sacrifices can be found in the *Toi-jo* of the *Gishiwajinden* (Chinese historical document written between AD 287-290), which refers to *jisai* or *seiko* (slaves or prisoners of war), who were forcibly placed on board ocean-going vessels. These *jisai* were on board to be used as live sacrifices for safe passage, and if the voyage passed without incident, so too would the *jisai* survive. However, if the voyage encountered difficulties, the *jisai* would be sacrificed.

In addition to the practices detailed above, there were also cases of rituals that involved mirrors being cast into the sea to appease the sea gods and pray for safe passage (Yu 2012). Furthermore, in the *Man-yoshu* poetry anthology there are 23 verses, including a long poem, that deal with prayers for safety of navigation, but due to space constraints these cannot be covered in detail here.

3. Rituals for safety of navigation on the Korean Peninsula

There are several sites on the Korean Peninsula where rituals for safety of navigation are known to have taken place, including Jungmak-dong, Buan-gun, Jeollabuk-do facing the Yellow Sea, Longtan-dong, Jeju Island, and Kapo-dong, Masan, Gyeongsangnam-do (Kyungnam University Museum, 2006), and also Cheonghaejin, Jang-do, Wando-gun, Jeollanam-do, and Hyeonpo-ri, Ulleung-do (Yu 2011, 2012).

Jungmak-dong is located on top of a coastal cliff, and the area served as a refuge harbor from the dangerous seas off the western coast of the Korean Peninsula, which is perhaps why rituals for safety of navigation took place during the fourth to sixth centuries. More than ten Wa-style keyhole shape burial mounds (*zenpokoen-fun*) dating to the late-fifth and early-sixth centuries have been confirmed in the vicinity, and the large tomb of King Muryeong was built against the backdrop of advancing international exchanges, including with Southern Dynasty China, Baekje, Wa and Gaya.

In the burial mounds in the Yeongsangang river basin region, wooden coffins were used that were made using umbrella pine grown in Japan, which testifies to the closeness of exchanges between the Korean Peninsula and Wa in those times. At Jungmak-dong, the open terrace rituals came to be practiced in a ritual building from the eighth century onwards (Yu, 2011, 2012). Still in existence today is the "sacred water temple" (*Suiseido*), the name of which has maritime connotations, and provides a counterpoint to the rituals for safety of navigation that took place on Okinoshima (Nishitani 2014; Yu, 2011)(Fig. 5).

Ⅳ. Conclusion: Maritime networks and World Heritage

The World Heritage Site "Sacred Island of Okinoshima and Associated Sites in the Munakata Region" is composed of eight properties and besides these core

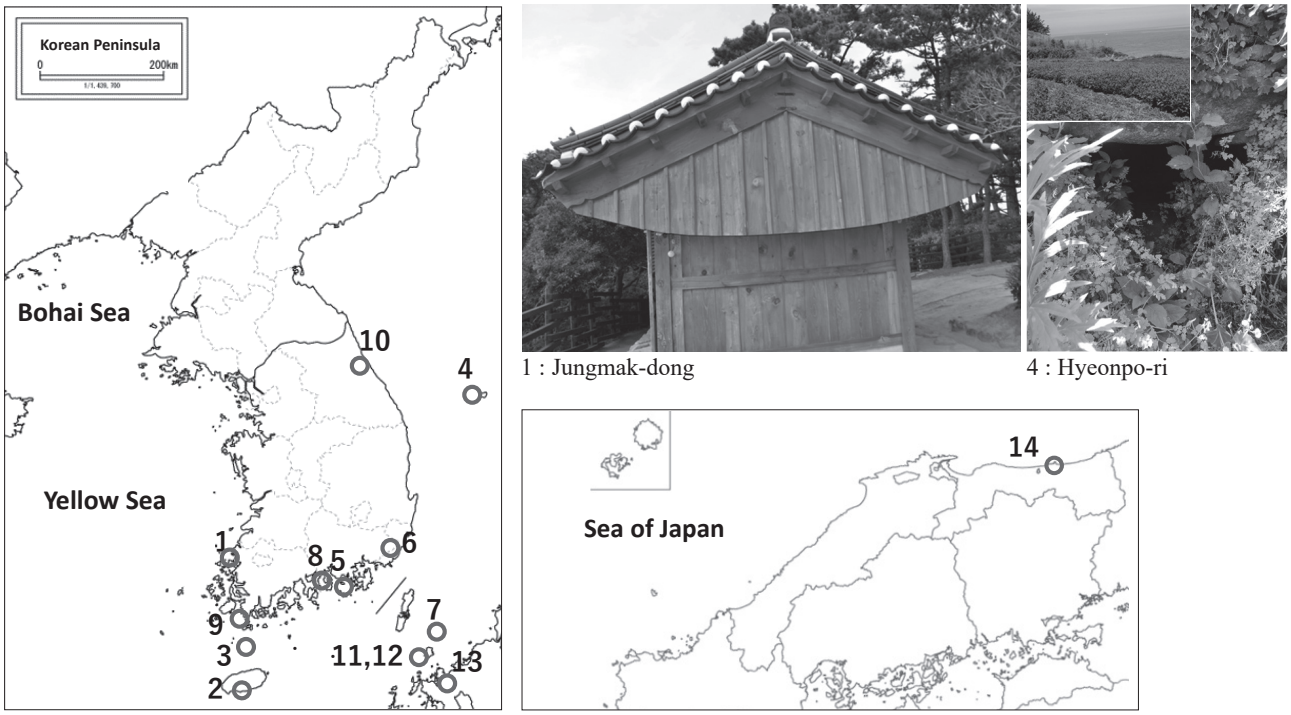

Fig. 5 : Safe Voyage Ritual and Bone Divination Sites in East Asia. 1～6: Safe voyage ritual sites, 7～13: Bone divination sites.
(1,4:Photo by author)

1 Jungmak-dong
2 Longtan-dong, Jeju Island
3 Cheonghaejin, Wan-do
4 Hyeonpo-ri, Ulleung-do
5 Kapo-dong, Masan
6 Kyodon-ri, Ulsan
7 Okinoshima Island
8 Nuku-do
9 Gungok-ri
10 Gangmun-dong
11 Harunotsuji, Iki Island
12 Karakami, Iki Island
13 Mutayori
14 Aoya-kamijichi

areas, there are several relevant sites with close links to Okinoshima. These include the Taguma-ishihatake site, Tsuyazaki burial mound complex, Tsuyazaki-sengen sites, Sakurakyo burial mound complex, and Orihata Shrine, which are all sites associated with the Munakata Clan and the seafaring traditions of Munakata in the Yayoi and Kofun periods. Moreover, there are many remains, burial mounds, and ritual sites scattered throughout the area beyond the Munakata region that demonstrate the realities of maritime-based interactions. These include the Harunotsuji site in Iki Island, Mine site in Tsushima Island, and the Nuk-do, Wan-do, Jungmak-dong, and Kapo-dong sites on the Korean Peninsula (Yu 2011), the burial mounds of the Yeongsangang river basin region (Takada 2019; Kwon 2019) and Hyeonpo-ri, Ulleung-do in the Sea of Japan.

The existence of a transoceanic network is reflected in the discovery of composite bone fish hooks and other fishing tools common to Japan and Korea during the Jomon period, the broad distribution of the custom of burning animal bones for divination practices, and the migratory footprints of the seafarers of Kanezaki *ama* divers for harvesting abalone shells as tributes and tax items.

Moreover, the shipwrecks, goods and items recovered from the seabed and exhibited in museums in China and Korea are a valuable source of comparison when exploring the significance of Okinoshima. It is to be hoped that underwater archaeology in Japan will make

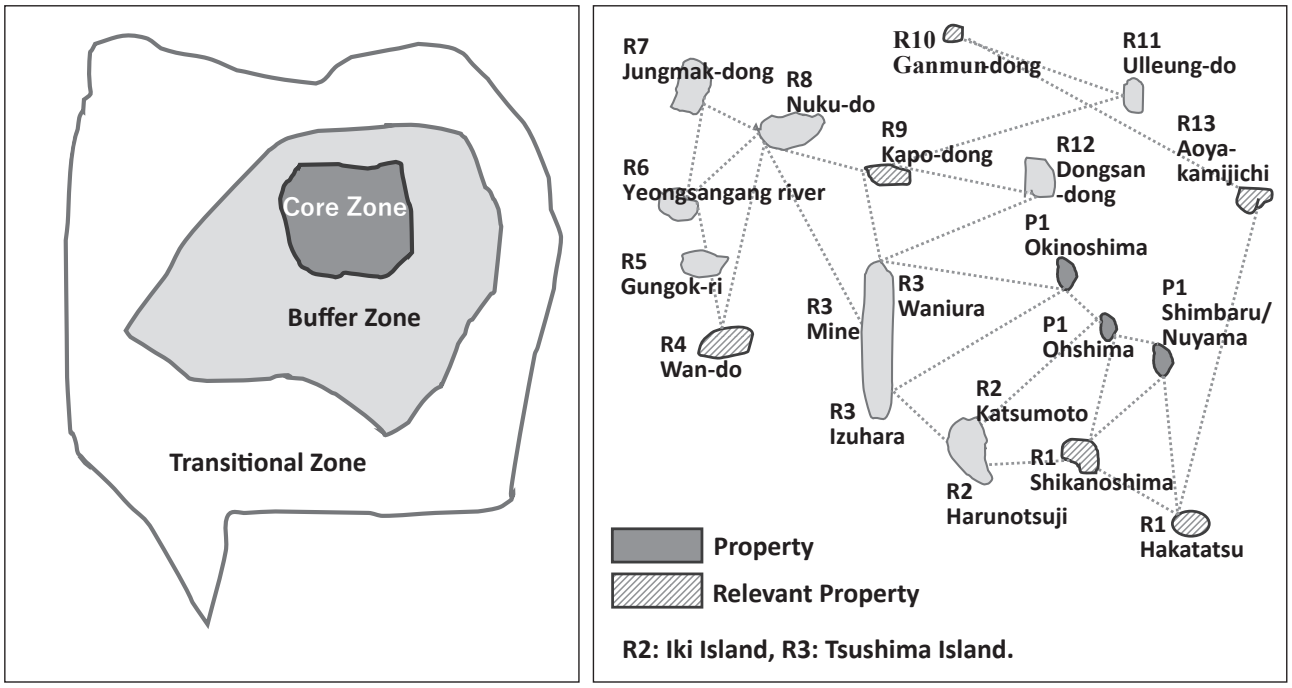

Fig. 6 : Land-based Model in the MAB/World Heritage (ICOMOS) (left) and Maritime Network Model (right), based on Munakata/ Okinoshima Properties (P1) and Relevant Sites (R1～R13).

more progress in the future.

As described above, archaeological sites relevant to the Okinoshima World Heritage are extensively distributed in islands and along coastal areas in East Asia. Indeed, the burial mounds in the coastal areas and small islands of the Genkai Sea region are closely related to the seafaring chieftains and maritime groups, and have significance also in that they form landmarks when viewed from the sea. There are many examples of such burial mound complexes that are worthy of note as landmarks visible from the sea, including the Mishima Jiikonbo burial mound complex (Yamaguchi Prefectural Board of Education, 1983; Yamaguchi Prefecture 1996), Koyama burial mound complex in Nagato and Yoshimo, the round burial mounds on Kaijima Island, north of Ainoshima Island, Tsuyazaki burial mound complex, Hirabaru burial mound No.1 (square tomb) on the Itoshima Peninsula, as well as many burial mounds in coastal and inland areas across the southern Korean Peninsula.

Cross-border maritime inter-regional exchange should be understood as “borderless networks.” This is a very different concept from the conventional land-centered, concentric-circle approach of the MAB concept (Man And Biosphere) and the World Heritage core zone/buffer zone/transitional zone concept, and therefore can also be said to be something that is unique to maritime World Heritage (Fig. 6). This gives added significance to the existence of World Heritage sites that span a wide area, transcending regions and countries. This is something that also corresponds to the dynamism of history and culture in human history, and could provide a new basis for considering the composition of World Heritage sites, including not only future research but also the utilization of cultural resources and international cooperation among related heritage groups.

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