

Production at the Kamuiyaki Kiln Site Cluster and the Connection of the Ryūkyū Archipelago to Surrounding Societies During the Eleventh Through Fourteenth Centuries

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Abstract: Kamuiyaki is a stoneware that was produced in Kamuiyaki on the Ryūkyū island Tokunoshima in the southwest of Japan between the eleventh and fourteenth centuries. In this chapter, the technological roots, production, distribution, consumption and typology of Kamuiyaki are introduced and the background of its formation, development and decline are discussed. While the technology was transferred from overseas, the production trend is related not only to the economic development in medieval East Asia but also the upgrading hierarchical organization on the Ryūkyūs. Besides kiln technology, Kamuiyaki offers important information about the state formation of Ryūkyū in a time for which written documents are scarce on the islands.

Keywords: Ryūkyū archipelago, Kamuiyaki, Gusuku period, Japanese Middle Ages, Goryeo stoneware, status-symbol culture

18.1. Introduction

The Kamuiyaki kiln site cluster in Tokunoshima is the oldest stoneware industry site in the Ryūkyū Islands. It was not based on the techniques for production of the local earthenware or the ancient Sue ware of southern Kyūshū, but was established on the basis of the stoneware technology of the Korean peninsula during the Goryeo period (918–1392). The emergence of Kamuiyaki signals that the Ryūkyū Islands had entered into the commercial area of East Asia, and this was the first step of the Ryūkyū archipelago in becoming connected with international societies. The Kamuiyaki kiln site cluster was designated as a National Historic Site of Japan in February 2007 because of its importance for understanding the Ryūkyū society and economy in an era when no texts were recorded.

18.2. The geographical environment of the Ryūkyū Islands and Tokunoshima

The Ryūkyū archipelago is the southernmost part of Japan, and consists of about 200 islands scattered between Kyūshū and Taiwan (Fig. 18.1a). It is characterized mostly by coral reefs in this subtropical climate area. The Ryūkyū Islands are divided into the Ōsumi Islands, the Tokara Islands, the Amami Islands, the Okinawa Islands and the Sakishima Islands, the proximate location of which is on the map (Fig. 18.1b). These islands are composed of volcanic islands (*kōtō* high islands) and of coral reef islands (*teitō* low islands). The former roughly corresponds to the area from the Ōsumi Islands to the Tokara Islands, and many of the latter are to the south of the Tokara Islands.

Volcanic islands are characterized by rich water and wood resources (Mesaki 1985: 12–21, Takanashi 2001: 221–30). Tokunoshima, included in the Amami Islands, is classified as a *kōtō* type island. On the central axis of Tokunoshima, there are six mountains with an altitude of over 400 m, and they are surrounded by terraces and dunes of Ryūkyū limestone (Fig. 18.1c). Isen Town, where the Kamuiyaki kiln sites were discovered, is located in the southern part of Tokunoshima, and its main industry is agriculture. The west coast of Isen Town has a wide, raised plateau of Ryūkyū limestone, and cliffs have been formed due to sea erosion. Coastal terraces and dunes have been formed from the south to the southeast. Contrasting topography can be seen in the east and west area of Isen Town. There are six rivers in Isen Town, which start from a high terrace close to the kiln site and flow radially into the sea through underground caves and valleys (Fig. 18.1c). Its highest mountainous area is composed of slate, tuff and diabase, and the surrounding plateau corresponds to the granite, Ryūkyū limestone and gravel zone. This means that topographical features are closely associated with its geology. According to a survey of natural vegetation (Terada 2015), the flora of the mountainous areas was similar to that of the Ryūkyū Aoki (*Psychotria rubra* (Lour.) Poir.)–Sudajii (*castanopsis Sieboldii* Subsp.) community. These results show that the plant distribution corresponds to the particularities of topography and geology.

18.3. The historical background of the emergence of the Kamuiyaki kilns

The Ryūkyū archipelago has a different history from its Japanese counterparts. First, the age of hunter-gatherers

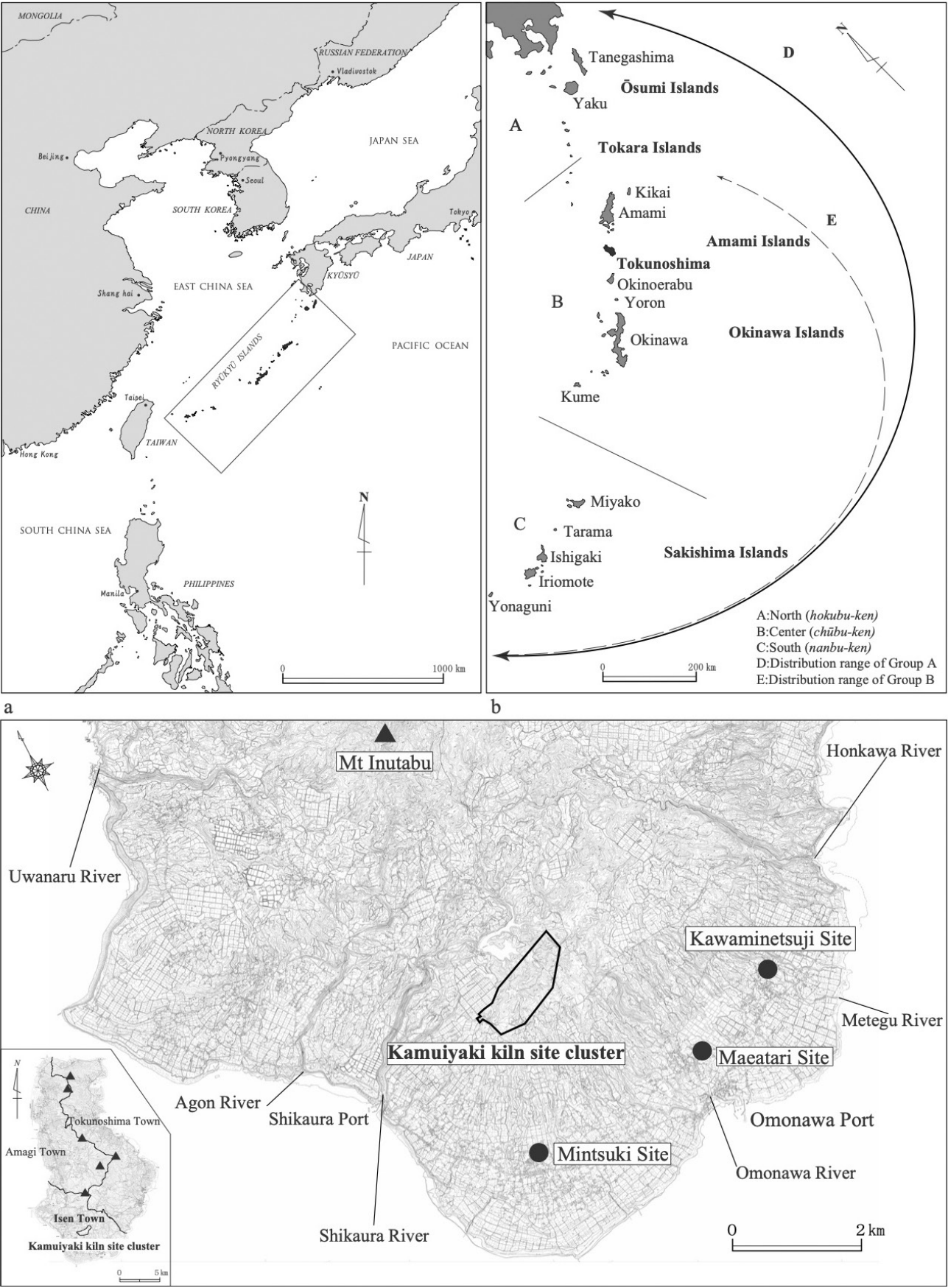


Figure 18.1. Geographical context and distribution of sites and cultural areas mentioned in this chapter. a: Location of the Ryūkyū Islands. b: Major islands, prehistoric cultural areas from north to south, distribution of Kamuiyaki pottery. c: Location of the Kamuiyaki kiln site cluster and related sites in Tokunoshima (Maps are redrawn by the author from Shinzato 2018: 2(a), Shinzato 2018: 2(b), Shinzato & Tsune eds. 2018: 5(c)).

(parallel to the Jōmon to Heian period, about 7,000 to 1,000 years ago) continued for at least 6,000 years. Second, the beginning of agriculture around the tenth century AD was much more recent than in the Japanese archipelago. These two historical distinctions mean that the prehistoric era of the Ryūkyū archipelago continued for a long time. However, the study of settlements and tombs, based on the highly accurate chronological studies of the local earthenware, suggests that social organization (settlement, labor investment and social division of labor) gradually progressed during the prehistoric period (Takamiya & Shinzato 2013: 106). In the prehistoric age, the resources available in subtropical forests and coral reefs were particularly important, and it is a well-known historical fact that shellfish inhabiting coral reef areas were transported to the Japanese archipelago and the Korean peninsula for trade after the Yayoi period in Japan (Kinoshita 1996). Although they did not belong to the national territory of the ancient state of Japan that started in the seventh century AD, imported goods from Kyūshū, including Sue ware from Nakadake, were brought to the Ryūkyū archipelago through trade and cultural exchange with remote areas.

In the prehistoric age of the Ryūkyū Islands, there were three cultural areas (Fig. 18.1b); the first is the northern area (Hokubu-ken), closely related to the pottery culture of Kyūshū (Ōsumi Islands–Akuseki Island in the Tokara Islands); the second is the central area (Chūbu-ken), with its own pottery culture (Takara Island and Kodakara Island in the Tokara Islands, Amami Islands and Okinawa Islands); and the last is the southern area (Nanbu-ken), which also shows some contacts with Taiwan and the Philippines (Miyako Islands and Yaeyama Islands) (Kokubu 1966: 34–40). Since the north side is close to Kyūshū and the south side is adjacent to Taiwan, these cultural characteristics had a tendency correspond to their location on the map. We can see such a diversity of material culture despite the common subtropical environment.

The proto-history period that followed is called the Gusuku period, during which the entire Ryūkyū archipelago reached the stage of a production economy supported by agriculture and livestock farming (parallel to the late Heian to Nanbokuchō period, about eleventh to fourteenth century) (Asato 1990: 110–11). Rice, barley, wheat, foxtail millet, millet (Takamiya & Chida 2014: 132–37) and the bones of cows and horses used as livestock (Toizumi 2011: 123–26) have been excavated from many of sites in the Ryūkyū Islands. These provide archeological evidence of the beginning of the Gusuku period. In addition, we can see a decrease in tortoises (*Ryūkyū-yamagame* (*Geoemyda japonica*)) compared to the previous era (Toizumi 2011: 124) due to the land development aimed at the maintenance of the *gusuku* (castles), villages and cultivated land. This shows that these social changes also had an impact on the surrounding environment. Widespread distribution of commodities had also begun. Kyūshū's talc pots for boiling were circulated throughout the Ryūkyū Islands, and local

earthenware with the shape of these was produced in the Amami, Okinawa and Sakishima regions. The stoneware manufactured in Tokunoshima (Kamuiyaki) was used as a set of tableware with these kinds of pots and Chinese ceramics. This means that the prehistoric Chūbu-ken and Nanbu-ken above were integrated into a common pottery cultural area.

In the first half of the Gusuku period (mid-eleventh century to mid-thirteenth century), pottery production, iron production and goods distribution started in earnest, and in the latter half (late thirteenth century to fourteenth century), the fortresses (*gusuku*) were constructed prosperously. Then, at the end of the fourteenth century, the three chiefdoms (Hokuzan, Chūzan and Nanzan) on the main island of Okinawa entered into tribute trade with the Ming Dynasty of China. The Gusuku period was an epoch-making era in which a more organized society (social division of labor, stratification etc.) was formed than before, and was also the premise of the Maritime City Nation Ryūkyū kingdom. In the Ryūkyū islands, a long-term, constant hunter-gatherer era continued, and there was the establishment of the Ryūkyū kingdom shortly after the spread of agriculture. Imbalance between the two is among the major characteristics of its history.

The Song Dynasty succeeded in turning high-quality goods such as ceramics into inexpensive mass products by promoting its own industry, and its development of marine transport led to these becoming widespread in the surrounding areas (Kamei 1986: 30, Yoshioka 1994: 38, Tsuchihashi 1997: 61). Japan's medieval era and Ryūkyū's Gusuku period correspond to this age. Hakata in northern Kyūshū was the international port city at which there were Chinese merchants called *Hakata Gōshu*. They set up their houses in Hakata and engaged in large amounts of goods trade from their homeland (Kamei 1986: 30). This trading system is called *Jūban Bōeki* (Kamei 1986: 24–35). On the other hand, great green turban shells (*Turbo marmoratus*) and trumpet shells (*Charonia tritonis*) from the coral reef areas of the Ryūkyū Islands (Kinoshita ed. 2002: 129–34, Takanashi 2005: 251–56) and sulfur from the Ōsumi Islands (Yamauchi 2009: 56–58) were shipped to Hakata. In this way, the Ryūkyū Islands became incorporated in the East Asian commercial zone through Hakata. This is the historical background of the various kinds of tableware that were transported from distant regions such as China, the Korean peninsula and Japan to the Ryūkyū Islands. From the perspective of the Ryūkyū's state formation, Pearson paid attention to the establishment of Kamuiyaki in such a historical context. He noted that the emergence of its production, distribution and consumption promoted population increase, technological diffusion, economic development, distribution patterns and social complexity, and they involved the creation of new identity. He also asserted that this process in the Ryūkyū Islands was part of medieval history in the Japanese archipelago (Pearson 2007: 145–46). Thus, Kamuiyaki is not only an archeological material symbolic of a time when the society

of the Ryūkyū Islands had begun to change significantly, but is also an important cultural heritage that is helpful in the reconstruction of East Asian history. Furthermore, this history is not limited to the Japanese archipelago. Due to its importance, the Kamuiyaki kiln site cluster was designated as a historic site in Japan in February 2007.

18.4. The discovery of the kiln

The earliest archeological record of Kamuiyaki pottery can be found in the manuscript “Local History Research ‘Tokunoshima’ in 1932,” by Yūryō Hirose, a local researcher who lived in Tokunoshima (Hirose 2019 [1933]: 43). Hirose discovered a small jar that had been stored in a private house in Kametsu Village, Tokunoshima. He introduced this jar as a pottery of Japan’s medieval period, with his own sketch of it. However, Hirose died at a young age, and the report was not officially published. Therefore, it was not until after World War II that Kamuiyaki pottery came to the attention of Japanese archeologists. After the 1950s, during which time there was a full-scale archeological survey of the Ryūkyū Islands, it became known that hard burned gray stoneware had been discovered along with Chinese ceramics in several sites of Amami and Okinawa (Tawada 1956). Kamuiyaki was excavated together with talc pots from Kyūshū, so archeologists thought that its origin was the Japanese archipelago at the beginning of the research (Kokubu et al. 1959: 248). Subsequently, some theories were announced that its production area was the main island of Okinawa (Tomoyose 1964: 19) or the Korean peninsula (Mishima 1966: 51). Then materials showing the overall shape were found in the Tokara Islands and the Amami Islands; from a comparative study of manufacturing skills, the opinion that Kamuiyaki’s technique was related to the ceramics technology of the Korean peninsula was proposed. Focusing on the wavy pattern and the firing technique, Kazumi Shirakihara pointed out the relationship between the ceramic pottery of the Korean peninsula and Kamuiyaki (Shirakihara 1971: 264). Based on the similar patterns of Kamuiyaki pottery and Koryo roof tiles, Tadashi Nishitani thought that the production skills of Kamuiyaki came from the Korean peninsula during the Goryeo era (Nishitani 1981: 83–84).

Till the kilns were found, the production site of Kamuiyaki remained a mystery for a long time. However, the discovery of the kilns on Tokunoshima Island in 1983 led to the question of the industry being solved immediately. Nobuhiro Yotsumoto, who was working at the Isen Town History and Folklore Museum, found that many pieces of pottery, charcoal and burned kiln wall clay were scattered at the pond’s renovation work area in Asan, Isen Town. After confirmation by Norikazu Gi, a local researcher who lived in Isen, and several archeologists from the Kagoshima prefecture and Amami-Ōshima Island, they concluded that Tokunoshima Island was indeed the production area of Kamuiyaki pottery (Gi & Yotsumoto 1984). Before

its homeland was revealed, this pottery was called *ruisueki* (Shirakihara 1973:11, 1975: 112), but then they named Kamuiyaki officially after the local name of the discovery area.

18.5. The history of kiln investigation

From October to November 1984, the year following the discovery of the kiln, the first confirmation survey was carried out with the aim of conservation, and three kilns and six ash heaps were excavated (Asan Kameyaki Group Area II, Fig. 18.2a). In addition, seven new kilns were found on the slope of a farm road located 50 m southwest of this area (Asan Kameyaki Group Area I). Since the former group would sink underwater in the pond after maintenance, an urgent full-scale survey of all the kilns in the construction area was carried out (Shintō & Aozaki eds. 1985a), and finally seven kilns, one pottery disposal pit and several ash heaps were excavated, and many relics were recovered (Shintō & Aozaki eds. 1985b, Fig. 18.2: b). The investigation of the production site revealed the kiln structure and size, the inclination angle and the height of the firing chamber, the shape of the firing entrance and the flue, and new knowledge about the vessel composition was gained (Fig. 18.3: 1).

Based on the shape of the kiln, and the existence of a bowl that imitated Song Dynasty Chinese ceramics, a technical and contemporary relationship with the Sagariyama kiln in southern Kyūshū was revealed (this is discussed below). Results from radiocarbon and geomagnetic dating concluded that the date of the kilns was between the eleventh and the thirteenth century (Shintō & Aozaki eds. 1985b: 97). In 1985, the range of the production area expanded to the east side due to the discovery of other kilns on the hill slopes southwest of the groups investigated in 1984 (Ushinohama & Inoue eds. 1986: 13–14). Then, in the third investigation, carried out from 1996 to 1999, due to the general survey at the entire area of Mt. Hirasuku, new kiln groups were discovered, and the range of the production area expanded further to the east (Aozaki & Itō eds. 2001, Fig. 18.2: a). From 2001 to 2005, high-precision topographic maps around kiln sites were created, and good residual status of kilns was confirmed by magnetic and electrical surveys (Nishiguchi 2005). A natural science analysis was also conducted involving the radiocarbon dating of carbons excavated from ash heaps (Paleoenvironment Research Institute Co., Ltd 2005a), the identification of tree species (Paleoenvironment Research Institute Co., Ltd 2005b) and an XRF analysis of excavated sherds (Mitusuji 1985, 2001, 2005). Archeologists from the Ryūkyū University in Okinawa also participated in these surveys, and a typological study of surface-collected potteries from each group was carried out at the same time (Ikeda ed. 2005: 45–110).

The number of areas where kilns were found increased to 13 through the progressive investigations. As a result of re-examining the distribution, location, scale and range

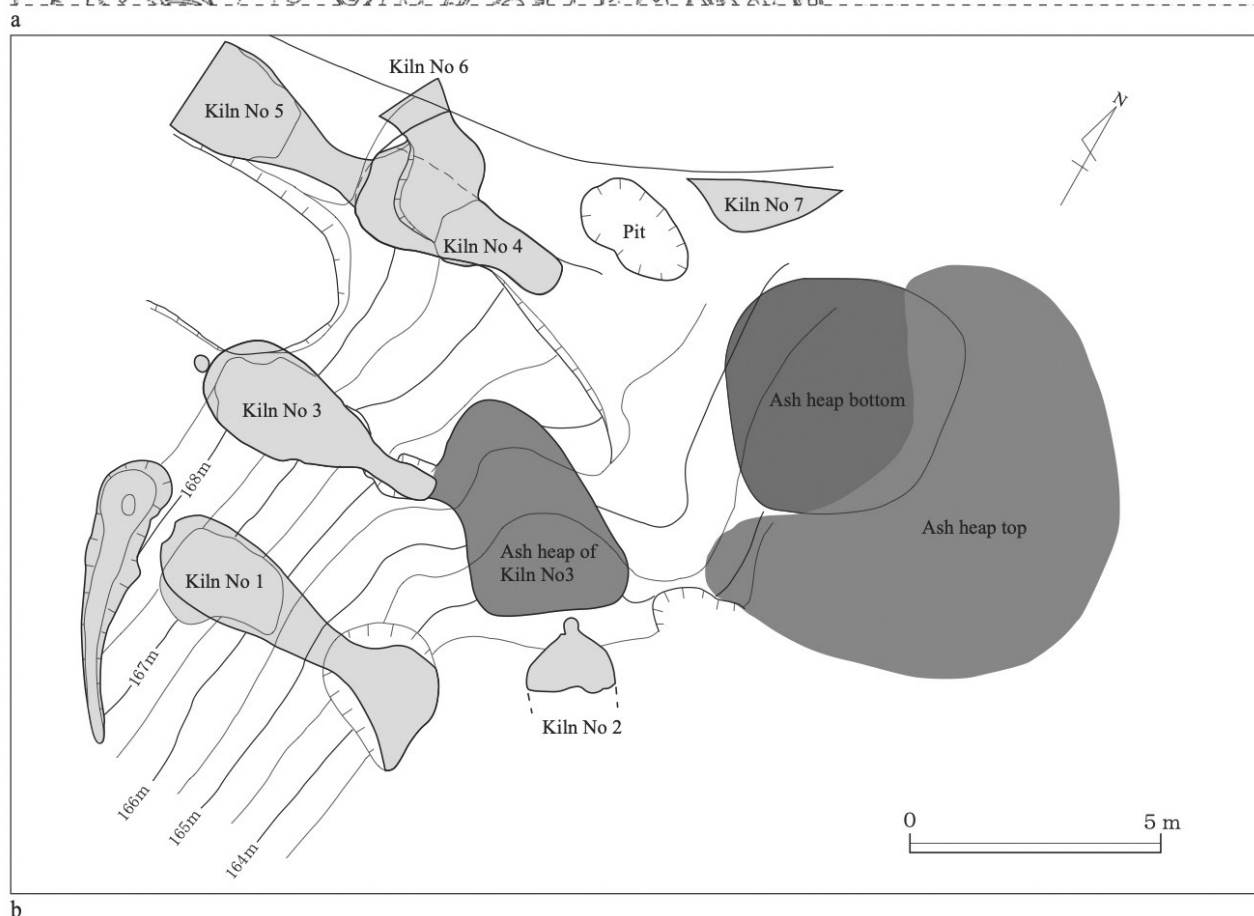
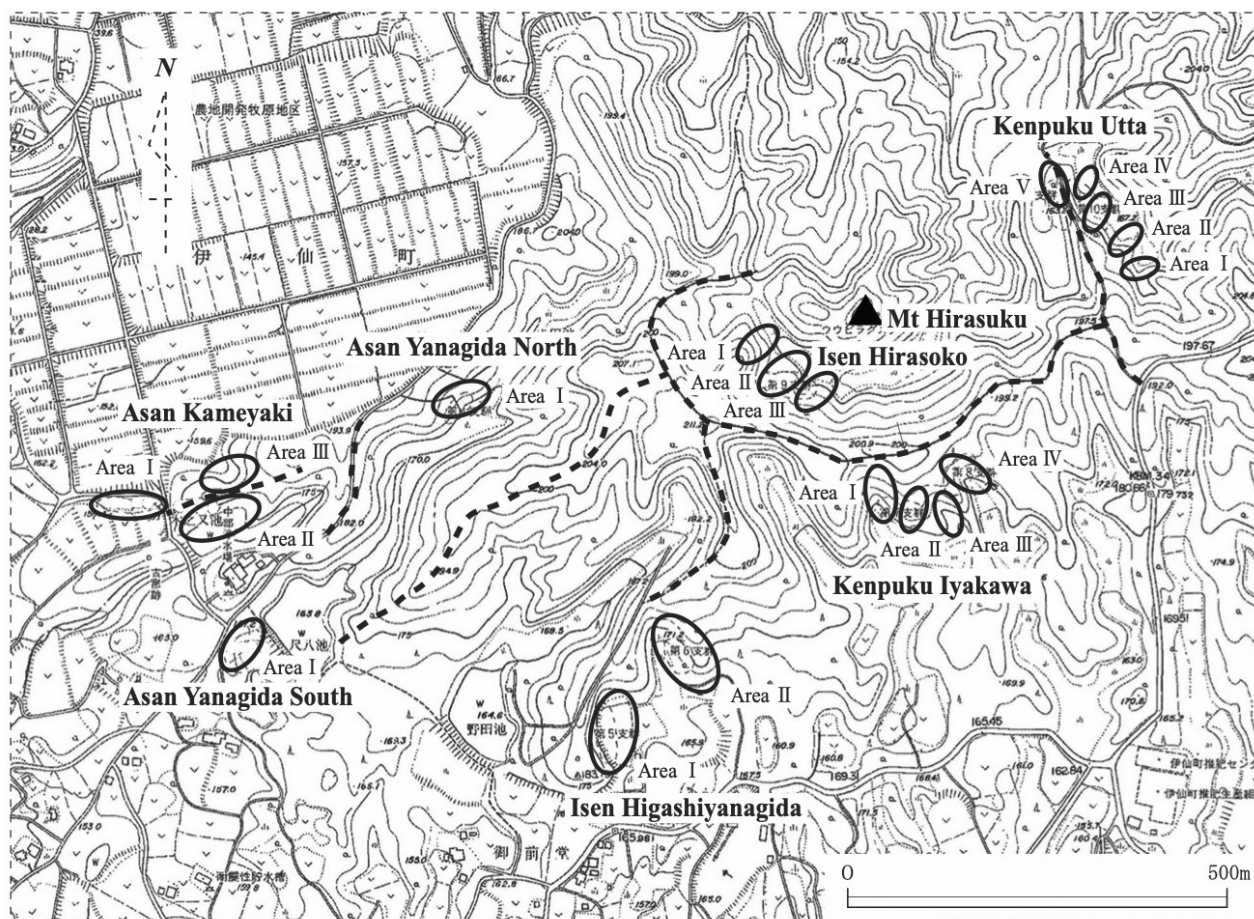


Figure 18.2. Distribution of kiln groups and kilns in Kamuiyaki. a: Location of kiln groups (Shinzato ed. 2005, 7); b: Distribution of kilns at Asan Kameyaki Group Area II (Shintō & Aozaki eds. 1985b: 11).

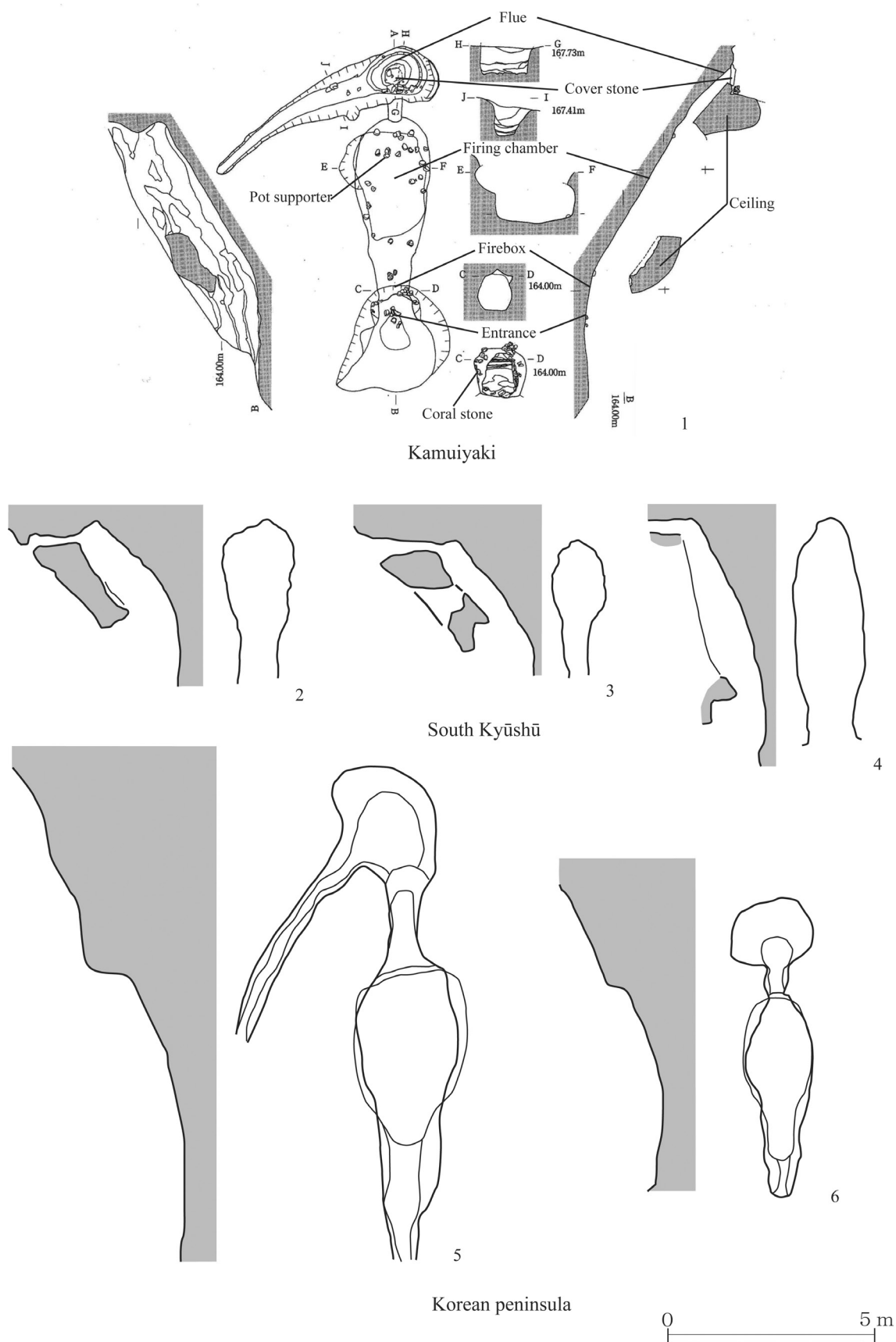


Figure 18.3. Construction of kilns from the Kamuiyaki kiln site cluster compared with kilns from South Kyūshū and the Korean peninsula. 1: Asan Kameyaki Group Area II, kiln No. 1 (Shintō & Aozaki eds. 1985b: 13–14); 2: Sagariyama kiln site cluster, kiln No. 1 (Matsumoto ed. 1980: 130); 3: Sagariyama kiln site cluster, kiln No. 3 (Matsumoto ed. 1980: 139); 4: Sagariyama kiln site cluster, kiln No. 8 (Matsumoto ed. 1980: 149); 5: Mujangri kiln site cluster, kiln No. 3 (Lee H., Lee S., O Gyujin, Na Geonju eds. 2000: 39); 6: Mujangri kiln site, kiln No. 2 (Lee H., Lee S., O Gyujin, Na Geonju eds. 2000: 35). – Modified from the excavation reports by the author.

of the kilns, the group composition, 19 production points already confirmed were reorganized into seven groups (Shinzato ed. 2005, Fig. 18.2: a).

18.6. The actual conditions of production

As a result of the excavation of kilns, the general survey of the forest and the natural scientific analysis (achievements of vegetation and geography investigations are discussed in detail below), the actual conditions of the pottery production gradually became clear (Shintō & Aozaki eds. 1985a, b, Aozaki & Itō eds. 2001, Shinzato ed. 2005). In previous surveys, an excavation of 10 kilns, 20 ash heaps and one pit, which was a pottery disposal, was carried out. The other kilns were limited to investigation by confirmation of ash heaps and electrical/magnetic exploration for proper preservation as part of the national heritage. But the pottery workshops, related villages and the harbor for shipping have not yet been revealed.

The features common to several kilns that survived well are summarized below (Fig. 18.3: 1):

1. The kiln is of a completely underground type constructed by excavating weathered granite soil, which is the bedrock soil of the hill, and shows a climbing kiln structure. It is speculated that this soil was suitable for tunnel excavation because it was clayey and well tightened. Although the ceiling is largely collapsed, the height of the firing chamber can be estimated to be around 80 cm from the remaining cases. Since the width of the firing entrance is narrower than that of the firing chamber, the plane shape reveals a deflated balloon shape.

2. The firing entrance has a width of 1 m and a height of 1 m and expanded in a fan-like shape toward the direction of the ash heap. Its floor kept a constant elevation level, but it had bumpy surface.

3. The firing place was slightly inclined upward compared to the entrance, and had a flat floor surface. The side wall of the firing place was constructed by embedding cuboid-shaped Ryūkyū limestones in the wall clay. The method of closing the kiln entrance was to stack the pot supporters and seal it with clay.

4. At the center of the kiln, where the floor surface has a steep slope of 31–42 degrees, is the firing chamber, and there are severe cracks and flaking due to the high temperature. The structure was a slope type without steps. Its cross-section shows two types, a barrel-vault type in which both sides rose vertically and an oval type in which both sides were stretched. In the firing chamber, it was confirmed that hoof-shaped clay pot supporters were arranged in an arc following the outer shape of the kiln.

5. The flue was dug diagonally from the ground surface toward the innermost part of the kiln, and the angle was steeper than that of the firing chamber. There was an

example of a drainage ditch dug near the vent, and the chimney was blocked with flat stone.

6. At Asan Kameyaki Group Area 2, it was confirmed that after the ceiling of the No. 4 kiln collapsed, the No. 5 kiln was constructed by digging out the innermost part of No. 4. It is probable that some kilns were repeatedly built in suitable areas for construction.

7. Taking the example of the ash heap from kiln No. 3 of Asan Kamuiyaki Group Area II, it had a length of 3 m, a width of 2 m, and a layer of 50 cm thickness. On the east side of the survey area in Asan Kameyaki Group Area II, four ash heaps were found with clay, which is a by-product of constructing the kiln, sandwiched between them. It can be seen that the top of the ash heap was developed when the new kiln was built.

The amount of excavated pottery from the kiln itself was small, and most of the excavated materials were from ash heaps. It is not clear how the potteries were placed in the kiln, because no kiln has been found that was abandoned during the firing process. Looking at the sherds of Kamuiyaki, the front and back surfaces are gray and the core is red, so it seems that oxygen was supplied by opening the entrance or flue during firing, rather than complete reduction firing. A flat stone near the chimney of kiln No. 1 at Asan Kameyaki Group Area II may be related to the opening and closing of the vent (Fig. 18.3: 1).

18.7. The natural scientific research

The geomagnetic (Tokieda & itō 1985: 48, Tokieda 2001: 76) and radiocarbon (Yamada 1985: 55, Paleoenvironment Research Institute 2005a: 82) analyses showed dates between the eleventh and thirteenth centuries AD. These results are consistent with the ages of the distribution sites in the Ryūkyū Islands.

According to X-ray fluorescence analysis of the pottery itself, Kamuiyaki had higher Fe and Ca compared to the pottery from the Japanese archipelago in the same period (Mitsui 1985: 54, 2001: 76, 2005: 65). It is possible to distinguish it from South Kyūshū and Korean peninsula pottery by analyzing the values of K, Fe, Rb and Sr (Mitsui et al. 2006: 16, Shinzato & Mitsui 2008). Most of the charcoal tree species found in the ash heaps were identified by analysis as *Sudajii* (*Castanopsis sieboldii*) (Paleoenvironment Research Institute 2005b: 84), and it was concluded that this was frequently used as fuel (Shinzato ed, 2015: 15).

Based on the results of the natural science analyses, the natural environmental factors of the pottery production were also considered. Fe and Ca are abundant in the pottery; it is said that the former was derived from weathered granite soil that forms the bed-soil of the forest where many kilns are located, and the latter originated from the Ryūkyū limestone that is distributed around there. It was assumed that the pottery material came

from the soil and minerals obtained around the kiln site (Naruo 2015). *Sudajii* (*Castanopsis sieboldii*), which still proliferates around the kiln site today, is said to be outstanding as a sustainable fuel because it has a strong fire power when burned and a high vitality of germination after logging (Terada 2015). Near the kiln site, there are some underground caverns and sinkholes made by water eroding the Ryūkyū limestone. In such an environment, a groundwater vein develops, so it is easy to gain abundant water (Naruo 2015). Clay, wood and water, the essential resources for pottery production, still remain around the kiln site.

18.8. Problems related to the shipping port and the potters' settlement

A natural environment similar to that around the kiln site can be seen in Mt. Amagi and Mt. Inokawa in the central part of Tokunoshima Island, but no kiln site has been found so far, because their high altitudes would have made it difficult to transport many products. This shows that not only materials but also a location with easy access to the coast suitable for its transportation were important for pottery production and widespread distribution.

Supposing that there was a base of transportation near the kilns, Omonawa, which is 2 km south of the Kamuiyaki kiln site cluster, is a promising candidate port, since sherds of Kamuiyaki and Chinese ceramic have been found on the sea bed (Nansei Islands Underwater Cultural Heritage Study Group, Laboratory of Material Culture Faculty of Low, Economics and Humanities Kagoshima University eds. 2013: 26–31). However, no relics related to medieval shipping have been found, so further underwater archeological investigations are needed.

Although the potters' residences have not yet been determined, as mentioned above, the settlements during the operation of the Kamuiyaki kiln site cluster were mostly distributed in the middle and high terraces of Ryūkyū limestone, the elevation of which is 100 m, lower than the location of the Kamuiyaki kiln site (Fig. 18.1c). Close to the kiln site, there are also the Mintsuki site (Shirakihara & Gi 1976: 67), the Kawaminetsuji site (Shinzato ed. 2010) and the Maeatari site (Shinzato & Tsune eds. 2018), and they have the common characteristic that most of the excavated remains were Kamuiyaki. In particular, the excavation survey of Maeatari sites found pillar holes of houses and warehouses, rice fields, iron furnaces, some tombs where iron swords, iron spindles, glass beads and Kamuiyaki pottery were buried (Shinzato & Tsune eds. 2018). But no tools related to the production of pottery were found in these sites, so it is assumed that the potters' work area was located in the forest close to the production area.

18.9. Typological study

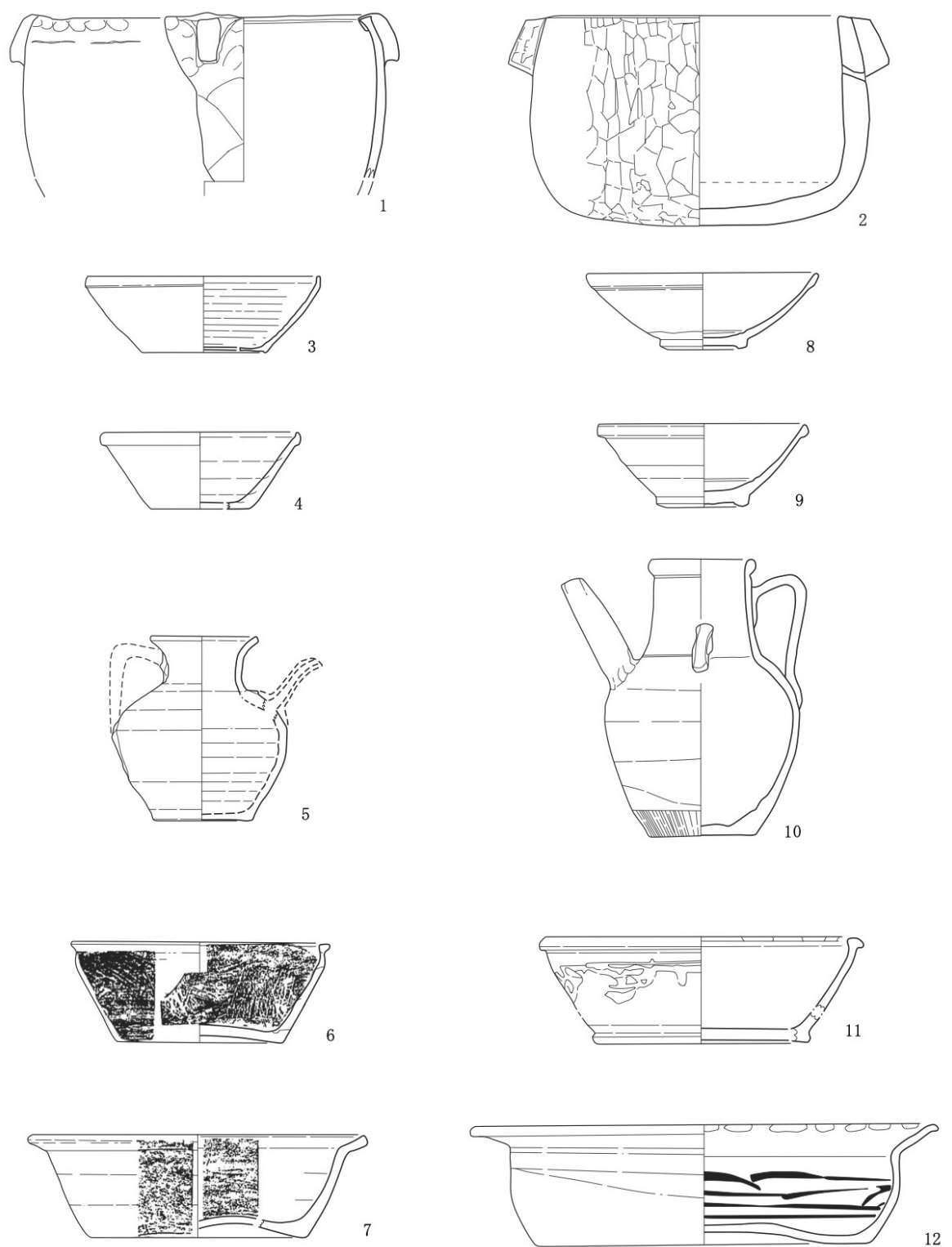
Shinji Satō, the pioneer of typological studies on Kamuiyaki pottery, clarified that the rim morphology of the

jar became plain in shape along with the simplification of the drawing pattern technique; for example, the transition from an individual drawing style to a spiral drawing style (Satō 1970:178–82). This typological change was later confirmed by an examination of articles unearthed from cave sites in Okinawa too (Asato 1975: 45–46).

Shortly after the discovery of the kiln site in 1983, the characteristics of the excavated Kamuiyaki pottery in the Okinawa area were summarized (Kin 1986); for understanding the correspondence between the production site and the distribution sites, much archeological information was gathered (Ikeda 1987). The results of Satō's research were inherited developmentally, and several scholars proposed a chronology of the jar that focused on its lip shape (Asato 1987: 76–77, 1991: 589–91, Ōnishi 1996: 26). As the number of related archeological materials increased due to a survey of kilns in Tokunoshima and of distribution sites in various parts of the Ryūkyū archipelago, the research achievements were published one after another to clarify the vessel composition (Yoshioka 2002: 414–23, Ikeda eds. 2005: 45–110, Asato 2006: 135–36). Through these examinations, the production of a bowl, a kneading bowl and a water ewer imitating the shape of Chinese porcelain gradually became apparent too, and Kamuiyaki pottery has attracted much attention, as an international stoneware incorporating the East Asian tableware culture of the medieval period (Fig. 18.4).

By comprehensive checking of materials excavated from the kiln sites, I have constructed their chronology. The resulting conclusions are that Kamuiyaki pottery was manufactured from the latter half of the eleventh century to the end of the fourteenth century and its production techniques changed significantly in the middle of the thirteenth century (Shinzato 2003a: 88). Beyond that, some characteristics of Kamuiyaki production, including the new findings obtained by the additional studies, are summarized below (Shinzato 2018: 93–117):

1. Jars, kneading bowls and pots have a common feature that their rim changed in a series from a three-dimensional shape to a flat and simple shape. They can be divided into six types (Shinzato 2018: 94).
2. Focusing on the change in the morphology of the jar's rim, the examination of its external form, the thickness of body, the presence or absence of wavy line patterns, the patterns of tapping and the treatments on their surface showed that Kamuiyaki can be classified into two groups. Group A have a thin body and there are dense grid marks or wide parallel lines on their inner surface. Group B has a thickened body type, their outer surface was smoothed by stroking, and narrow parallel lines are left on their inner surface sparsely. Group A corresponds to rim types 1 to 4; Group B correlates with types 5 and 6 (Shinzato 2018: 103–05). Similar classifications have been proposed by Okinawan researchers and will not change significantly in the future (Kin 1986, Ikeda ed. 2005: 108–09).



1: Local earthenware (pot shape) from Atta shell-mound site, produced in Okinawa.
 2: Talc pot from Uminonakamichi site, produced in Kyūshū.
 3-7: Kamuiyaki from Kamuiyaki kiln site cluster and Kanna Yūagimō site.
 8-12: Chinese ceramics from Dazaifu site.

0 20cm

Figure 18.4. Imitation phenomenon of imported tableware seen in local earthenware and Kamuiyaki in the Ryūkyū Islands (1: Kin & Higa eds. 1979: 32; 2: Yamasaki ed. 1982: 80; 3: Aozaki & Itō eds. 2001: 23; 4: Shintō & Aozaki eds. 1985b: 78; 5: Shinzato ed. 2005: 16; 6: Shintō & Aozaki eds. 1985b: 77; 7: Shintō & Aozaki eds. 1985b: 76; 8: Miyazaki ed. 2000: 16; 9: Miyazaki ed. 2000: 13; 10: Miyazaki ed. 2000: 58; 11: Miyazaki ed. 2000: 54; 12: Miyazaki ed. 2000: 54). 1: Local earthenware (pot shape) from Atta shellmound, produced in Okinawa. 2: Talc pot from Uminonakamichi site, produced in Kyūshū. 3–7: Kamuiyaki from Kamuiyaki kiln site cluster and Kanna Yūagimō site. 8–12: Chinese ceramics from Dazaifu site.

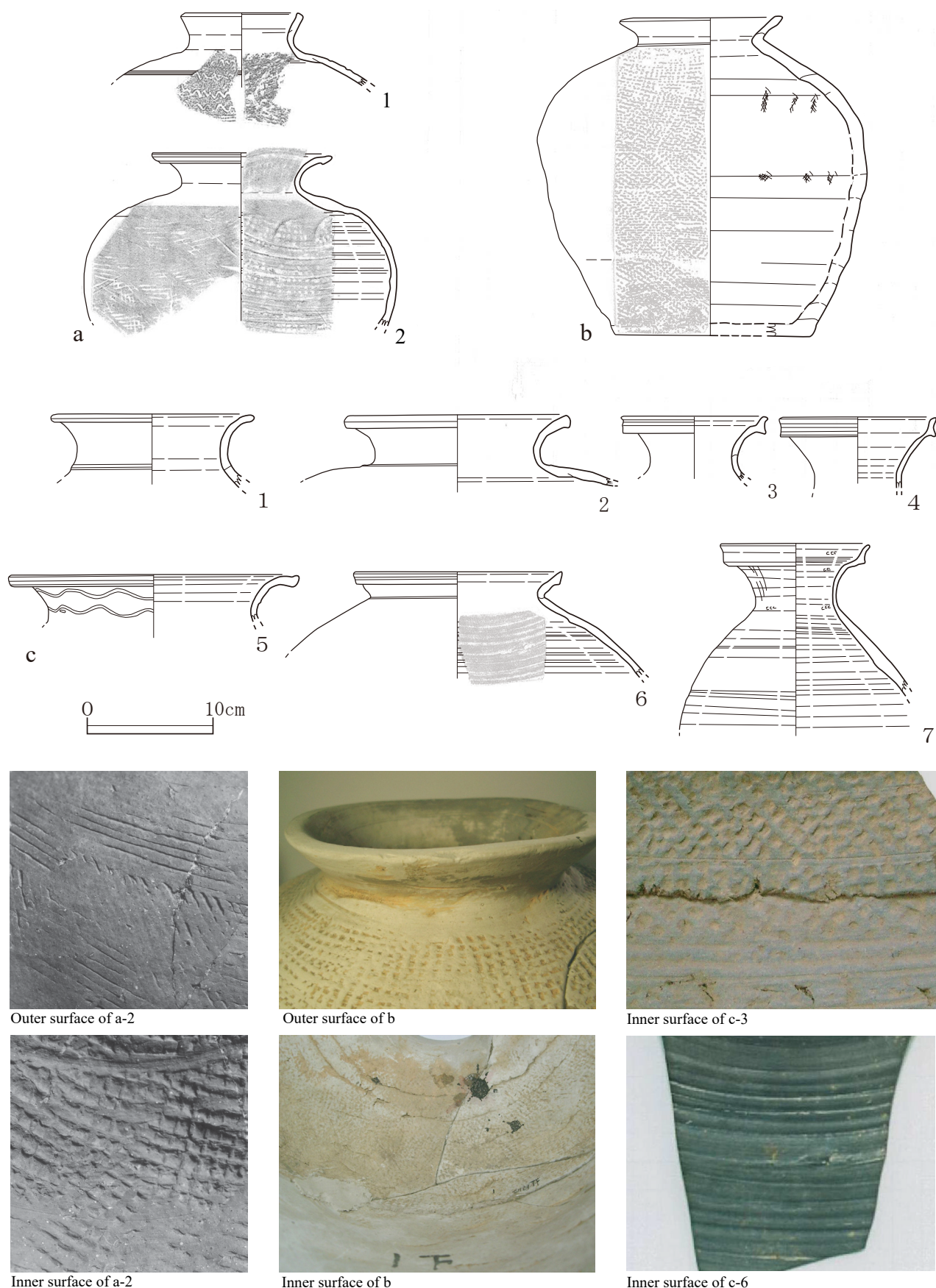


Figure 18.5. Vessel formation techniques of Kamuiyaki, Goryeo and Sagariyama pottery. a (Kamuiyaki): 1: Isamēbaru No. 1 site (Tōme ed. 2001: 72); 2: Kamuiyaki kiln site cluster, Asan Yanagida South group (Aozaki & Itō eds. 2001: 15); b (Sagariyama): Sagariyama kiln site (Matsumoto ed. 1980: 135); c: 1–4: Mungri kiln site cluster (Lee H., Lee S., O Gyu-jin, Na G. eds. 2000: 48; 58), 5–6: Dazaifu site (Kyūshū Historical Museum ed. 1990: 106; 101); 7: Hakata site (Shimomura ed. 1996: 30). – Photographs without scale. – Drawings modified by the author, photographs by the author.

3. The latest chronological chart created after typological examination is shown in Fig. 18.6 (Shinzato 2018: 111). Kamuiyaki production is largely divided into two stages, and there are six small epochs subdividing it.

4. The products of Group A were jars, kneading bowls and pots. In Group B, there were large vessels such as very large-sized kneading bowls and pots (Shinzato 2018: 112–13). However, in both groups, jars account for more than 60 percent of the total number of vessels (Shinzato 2018: 112).

5. The boundary between Group A and Group B is in the middle of the thirteenth century (Shinzato 2018: 113–15). At this time, the production in Kamuiyaki changed significantly.

The Isen Town Board of Education, which manages the kiln site, is currently repairing excavated potteries with the aim of publishing a comprehensive research report on the Kamuiyaki kiln site cluster. Recently, results have been published in which two scientific groups extracted by neutron activation analysis of 20 samples picked up from these restorations correspond to the Group A and Group B described in this paper (Sterba et al. 2020: 511). Archeologists and scientists have already begun collaborative investigations into the actual conditions of pottery production, and the continuation of such researches will reveal chemical characteristics of clay paste not only caused by differences in their age but also those from vessel types. Furthermore, by analyzing potteries excavated from the consumption sites, it is expected that the distribution conditions which cannot be visually confirmed will be elucidated – for example, the circulation process from a certain production group to a specific island.

18.10. Technical genealogy and distribution

As mentioned above, Kamuiyaki is similar to Goryeo pottery, and it has been thought that the kiln structure and vessel composition are closely related to Southern Kyūshū. In the 1990s, it became clear that Goryeo pottery tends to be excavated from the international port city Hakata and the national institution Dazaifu (Akashi 1991), and the similarity in production technology between Kamuiyaki and Goryeo pottery was refocused (Akashi 1999: 56, 2007: 127–30). Yoshifumi Ikeda, who paid attention to this situation, argued that further research with a broader perspective on East Asia was needed (Ikeda 2000). Nevertheless, from the standpoint of emphasizing the commonality of kiln structure and vessel composition, mainly the jar, the relationship between Kamuiyaki and Sagariyama continued to be supported (Ōnishi 1996: 64–65). However, an excavation survey of Mujangri kiln site (Lee et al. eds 2000) in South Korea from 1997 to 1998 made it possible to compare Kamuiyaki with Goryeo pottery and Sue ware from Sagariyama kiln site archeologically. With this opportunity, I re-examined these potteries and confirmed the similarities between Kamuiyaki and Goryeo pottery in the rim-shaping technique with beating, as well

as the tapping pattern (Shinzato 2004: 330–38, Fig. 18.6). Regarding the kiln structure, although there are differences in the angle of their flue, kilns from Kamuiyaki, Mujangri, and Sagariyama shared their basic plane shape: the deflated balloon type (Shinzato 2004: 330–38, Fig. 18.3).

Studies of Sue ware (Yoshioka 2002: 432–34) and roof tiles (M. Uehara 1980: 6) have confirmed that the ceramic production in medieval Japan was technically influenced by Goryeo, and old Okinawan roof tiles were too (S. Uehara 2000: 39). These facts indicate that the exchange of ceramic technique among these three regions was common in their history. Considering this historical background, it can be accepted that the Ryūkyū islands, which had lacked the tradition of pottery production until then, were directly influenced by the technology from the Korean peninsula, and then Kamuiyaki, which is similar to Goryeo pottery, was established. How was the transfer of ceramic techniques to Tokunoshima Island realized? To understand this, it is effective to examine the relics brought from the Korean peninsula to the Ryūkyū archipelago.

In recent years, archeological survey of the Amami Islands has reported the discovery of Goryeo's pottery and celadon, which dated to the eleventh century (Shinzato ed. 2010: 108, Matsubara et al. eds. 2015: 43, Shinzato & Tsune eds. 2018: 53). These were not excavated in as great a quantity as Kamuiyaki and Chinese ceramics, and tend to be found on specific islands, such as Kikai Island, where the distribution base was located, and Tokunoshima Islands, which was the stronghold of Kamuiyaki production. The small amount of excavated material and limited find cases of these are the same in Kyūshū (Yamamoto 2003: 79). This shows that they were not imported as commodities, but as the daily necessities or transport containers of visitors from the Korean peninsula (potters and merchants). Focusing on this archeological condition, it is highly probable that the emergence of Kamuiyaki kiln site cluster was achieved by the migration of a certain number of potters from the Korean peninsula rather than just the transfer of ceramic technology (Shinzato 2020: 34–36).

In order to understand the economic background of its introduction to Tokunoshima Island, it is important to confirm the distribution of the older type of Kamuiyaki's Group A. These were circulated mainly in Amami and Okinawa Islands, but were spread to Kyūshū in the north and Sakishima Islands in the south (Fig. 18.1b, Shinzato 2018 [2003b]: 120). This situation indicates that the Ryūkyū Islands had a strong economic relationship with Kyūshū when the Kamuiyaki production started. It is in harmony with the fact that Kyūshū's talc pots have been excavated throughout the Ryūkyū archipelago. Considering the economic circumstances at that time, it is assumed that the transference of ceramic skills from the Korean peninsula reached the Tokunoshima Island via Kyūshū.

On the other hand, the newer Group B are very few in the north of Tokara Islands and Sakishima Islands, which

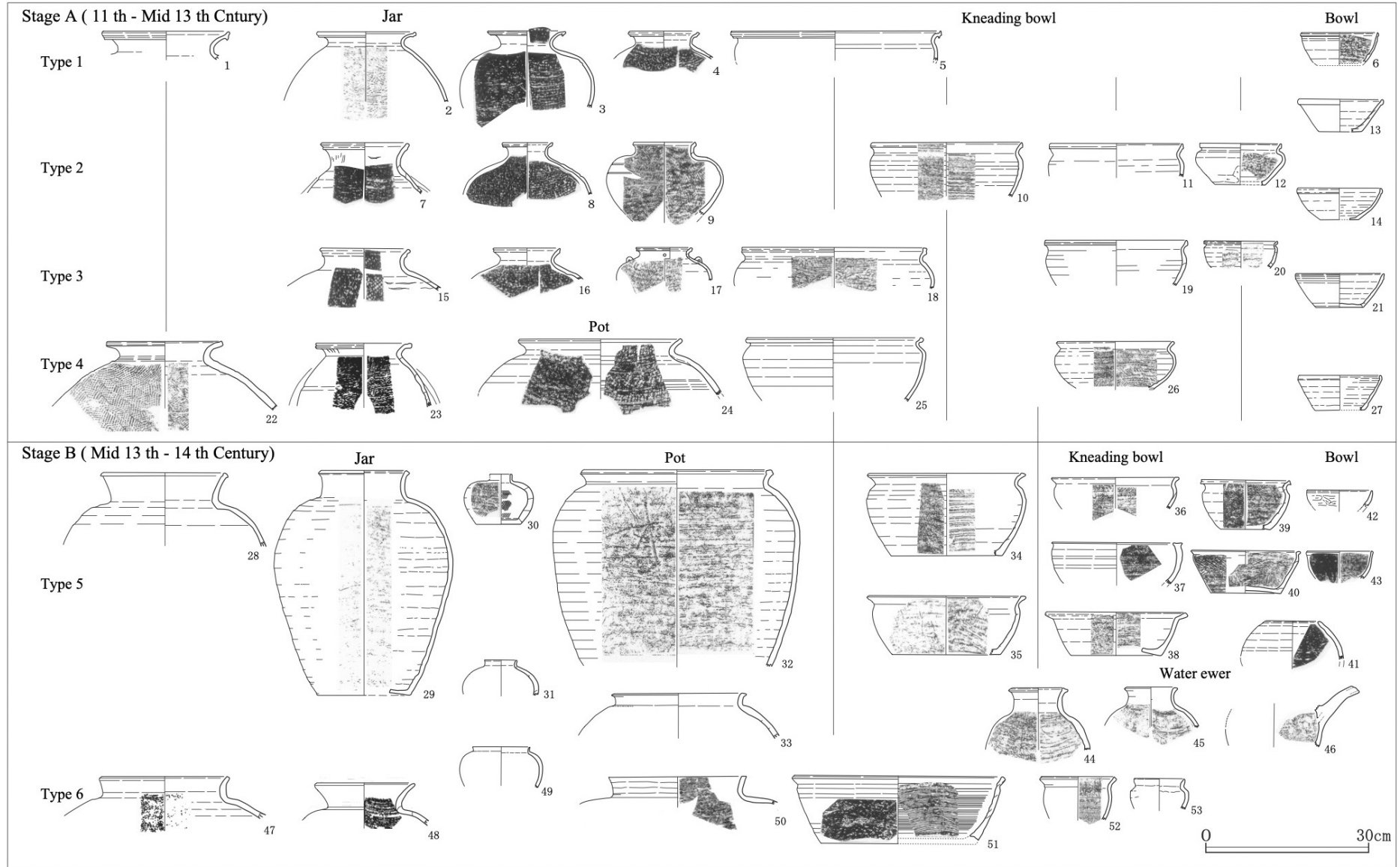


Figure 18.6. Chronology of Kamuiyaki pottery (Shinzato 2018: 111, modified by the author).

shows their different distribution status. As Asato (2006: 37) points out, the number of excavations in Amami Island and Kikai Island decreased, and Tokunoshima Island and Okinawa Island came to be the center of consumption (Shinzato 2018 [2003b]: 120–23). This means that the change of distribution area corresponded to the innovations of the production technique in kiln sites shown above. From their technological origin and distribution, it can be assumed that the series of historical processes, Kamuiyaki's establishment, development and demise, correlated with the negotiation relationships in medieval East Asia. To verify this, the next section will examine how Chinese ceramics were brought into the Ryūkyū Islands, and consider the causality between Kamuiyaki production, the trade network and the society of the Ryūkyū archipelago.

18.11. The Ryūkyū Islands society from the viewpoint of Kamuiyaki production

Chinese ceramics from the Tang Dynasty to the northern Song Dynasty (late eighth century to early eleventh century) were excavated in the Amami Islands, but it was after the middle eleventh century that these ceramics were used throughout the Ryūkyū archipelago. In the eleventh to twelfth century, bowls and plates were mainly consumed, and these tend to be excavated together with Kyūshū's talc bowls. Therefore, it is believed that these porcelains were brought to the Ryūkyū Islands via Kyūshū (Kin 1998). This is also supported by the fact that the types of Chinese ceramics before the first half of the thirteenth century are not much different from the general archeological sites in Japan around the same time (Morimoto & Tanaka 2004: 366). From the historical situation that international trade was exclusively developed in the port city Hakata at that time (Ōba 1999: 89), it can be read that Japan's international trade with Song and Goryeo Dynasty, which lay behind the transfer of ceramic technology from the Korean peninsula, reached Tokunoshima Island.

Among the islands of the Ryūkyū archipelago, the Amami Islands tend to produce many Chinese ceramics excavated from the eleventh and twelfth centuries. They are located on the northern edge of the Ryūkyū Islands, so it can be judged that they played a leading role in trade with Kyūshū (Shinzato 2018 [2015]: 79). The reason why Tokunoshima was selected as the production center of Kamuiyaki may be due to the trade advantage of the Amami Islands in addition to the natural environment suitable for pottery production.

From the latter half of the thirteenth century, Chinese ceramics were consumed more than before in the Ryūkyū Islands (Shinzato 2018 [2015]: 80). Because the composition of Chinese ceramics in the Amami Islands around this time is similar to that in Kyūshū, it is considered that the economic relationship between the Amami Islands and Kyūshū continued (Shinzato 2018 [2015]: 83). However, on the other hand, a new situation has been confirmed in the Sakishima Islands.

A certain amount of Fujian porcelain called Nakijin type and Birōsuku type was consumed, while there was little Chinese ceramic (White porcelain type IX in the F period of Dazaifu) of the type that was common in Kyūshū at the same era (Shinzato 2018 [2015]: 82). Both of these Fujian porcelains, which date from between the middle of the thirteenth century and the middle of the fourteenth century, proved to be the products of the Min River basin by the survey of their production area (Kinoshita ed. 2009: 253). These were rarely excavated in Hakata (Tanaka 2009: 97), and are thought to have been brought to the Ryūkyū Islands from South China via the Sakishima Islands (Kinoshita ed. 2009, Ikeda 2019: 34–35). Nakijin type and Birōsuku type are the archeological evidence that symbolize the new economic relationship between the Ryūkyū Islands and South China. In addition to this, the Sakishima Islands have the regional features that there are very few examples of Kamuiyaki Group B, and they are instead rich in possession of Chinese brown-glaze potteries, the vessel types of which are jars, pots, kneading bowls and water ewers (Shinzato 2018: 156).

From the distribution patterns of Chinese ceramics, we can read the process that the Ryūkyū Islands were connected to Kyūshū through the Amami Islands from the eleventh century on, and the economic network was diversified due to the linkage between the Sakishima Islands and South China after the mid-thirteenth century. This was not unrelated to the emergence of Kamuiyaki in the eleventh century, and in particular the major shift in its production in the latter half of the thirteenth century must be strongly related to the latter situation. This is because the rise of the Sakishima Islands must have led to competition between Kamuiyaki and Chinese ceramics. From this point, it can be accepted that the flat and simple appearance of Kamuiyaki Group B was due to the efficiency improvement of manufacture aiming at mass production (Shinzato 2018: 156). As mentioned above, it is clear that the production trend of Kamuiyaki was closely related to the economic situation in medieval East Asia. There is no doubt that the Kamuiyaki kiln site cluster is an important cultural heritage for understanding the history of the Gusuku period, for which there is no direct textual material. Finally, I would like to focus on the symbolic aspects of Kamuiyaki and conclude this chapter by giving my opinion on the process of increasing social complexity in the Ryūkyū archipelago.

It is highly likely that the Amami Islands had already reached a stratified social stage when the Kamuiyaki production started, because castles that require large-scale civil engineering work, and huge settlements which played the role of trading hub centers appeared on Amami Island and Kikai Island (Nakayama ed. 2003, Matsubara et al. eds 2015). This is the reason why plenty of Chinese porcelains were brought to the Amami Islands due to their strong economic relationship with Kyūshū. What we should pay attention to here is the existence of the Kamuiyaki bowl. These bowls, which imitated Chinese porcelain, were actively consumed in the Amami

Islands, where aggressive trading was developed and social stratification was relatively advanced (Shinzato 2018: 132). This fact indicates that these were not daily utensils that made up for the shortage of Chinese ceramics, but the symbolic tableware used effectively in a layered society. That is, it can be hypothesized that Kamuiyaki bowls had a cultural function that expressed the social hierarchical position of those who used them. If we confirm the consumption pattern of Kamuiyaki bowls according to this hypothesis, this expression culture begun to flourish in the Amami Islands, which had the advantage of trade, and after a while gradually spread to the entire Ryūkyū archipelago. Ultimately, it came to be a cultural phenomenon predominantly recognized in Okinawa Island in the middle of the thirteenth century (Shinzato 2018: 155). On Okinawa Island from the mid-thirteenth century to the fourteenth century, the construction of a large-scale castle began, and three kings started tribute trade with the Ming Dynasty of China. These historical facts are evidence that a more highly stratified society was established on the main island of Okinawa.

It can be read that the remarkable development of the hierarchical expression culture using tableware on Okinawa Island at this period was deeply related to these historical circumstances.

The reason for the end of production of Kamuiyaki is probably that many Chinese ceramics were brought to the Ryūkyū Islands by direct negotiations with the Ming Dynasty after the fourteenth century, and that it lost the economic competition with them (Ōnishi 1996: 33, Shinzato 2018 [2003a]: 117). The subsequent movement of the potters group has not been clarified. They may have been converted to roof-tile makers of Okinawa Island. This is a subject for future research.

18.12. Conclusion

The discovery of the Kamuiyaki kiln site cluster on Tokunoshima Island far from Okinawa Island, the base of the Ryūkyū Kingdom, is evidence of the social division of labor across the sea during the Gusuku period, and it reformed Ryūkyū's historical image. The introduction of ceramic technology to Tokunoshima Island was due to the economic activities of the Amami Islands and Kyūshū. This can be positioned as an extension of the international trade between Japan and the Song Dynasty, Japan and the Goryeo Dynasty developed in Hakata. The centralized production of Kamuiyaki on Tokunoshima Island and its widespread distribution were inseparably achieved with the spread of agriculture in the Ryūkyū archipelago, and played a major role in the integration of tableware culture in the Amami, Okinawa and Sakishima Islands.

According to typological examination of Kamuiyaki, its production surely started in the middle of the eleventh century, and its appearance and production techniques changed significantly in the middle of the thirteenth

century. During this period, because of the highly motivated trade activities of the Sakishima Islands with South China, it can be concluded that Kamuiyaki's production conversion was the result of mass production in preparation for competition with Chinese ceramics brought from the south margin. In addition, the Kamuiyaki bowl had a cultural function that expressed the social class of its users, so it is very useful for understanding the evolution of the Ryūkyū Islands society, where hierarchization was progressing. In other words, this symbolic significance of Kamuiyaki has the potential to contribute to the elucidation of the state formation process in the Ryūkyū archipelago.

In this way, the production and distribution of Kamuiyaki corresponded to the economic situation in medieval East Asia and the development of the Ryūkyū Islands' society. Kamuiyaki kiln site cluster provides us with the important historical information mentioned above, and so has remarkable value as cultural heritage. Some surveys of the industry areas revealed that the kilns were well preserved and various types of vessels produced, but the amount of products in a single firing has not yet been clarified. In addition, the potters' settlements and the shipping port of the potteries have not been discovered. Also, the whereabouts of the craftworker group after the abolition of the kilns is left to future investigations. In order to clarify these problems, further research is necessary and depends on active cooperation among archeologists, historians and natural scientists.

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Glossary

The glossary lists names and terminology mentioned in this book that are characteristic to kiln research in East Asia. Several research traditions and languages use different names or writings for identical or mostly identical sites or concepts and methods. For each name or term that may not be well known to the Western reader, and which occur in one of the chapters, an entry is given exactly the way the name or term occurs in that chapter, i.e. in a writing that may be considered standard or a variant.

If a term or writing is considered a variant, the entry only links to an entry that is considered standard.

An entry is considered standard either if (a) it is a translation into English which conveys the meaning well and is not tightly bound to one of the various cultures or traditions, or (b) if it is a transliteration that follows a standard transliteration of the language as defined in the introduction. In some cases, the editors suggest an English translation that is not established but at least is not bound to one tradition one-sidedly. In most cases these are suggestions for Western terminology from the introductory chapter and therefore have no East Asian writing counterparts; these suggestions may be object to future discussion for a consistent and culture-independent terminology in this field of archaeological studies.

The standard entry also lists variants in translation or transliteration as well as in other languages that are used in this book or are otherwise common. Some of these variants may deviate slightly from the concept of the entry or are outdated; they are mentioned nevertheless since they can be found in literature that is still valuable. As for variants in East Asian scripts, the language is not indicated but may be inferred from the concrete form. However, the Chinese, Korean, and Japanese writing may look identical in many cases.

The aim of the glossary is to help the reader making connections between concepts and regions which may be difficult to understand otherwise; the editors are thankful for any critique that improves the suggestions for a consistent terminology. This glossary is the result of collaboration of authors and editors, however, responsibility for errors and other shortcomings is with the editors.

Abaoji (hist. name), also *Yelü Abaoji*. 阿保机, Амбагян.
anagama (kiln term.), see *long-body kiln without oven floor*. 龙窑、平焰龙窑, 登窯, 登窯、窖窯、穴窯.
Anan'evka walled settlement (site), also *Anan'evka walled town*. Ананьевское городище.
Anshan (kiln site), see *Xiaoshan Anshan*. 安山.
Arahira (kiln site), also (*Nakadake Sanroku Arahira subcluster*). 荒平、(中岳山麓荒平支群).
Arao (kiln site). 荒尾(窯跡群).
Arimata (kiln site). 苅又遺跡.
Asakura (kiln site). 朝倉(窯).
Asan Yanagida (kiln site). 阿三柳田.
ash deposit (kiln term.), see *ash heap*. 灰坑, 灰原, 灰原.
ash glazed pottery (ware). 灰釉陶器.
ash glazed pottery kilns (kiln term.). 灰釉陶器窯.
ash heap (kiln term.), also *ash pile*, *ash deposit*; not: *ash pit*. 灰坑, 灰原, 灰原.
ash pile (kiln term.), see *ash heap*. 灰坑, 灰原, 灰原.
ash pit (kiln term.), not: *ash heap*.
Ata district (hist. name). 阿多郡.

Atta shellmound (site). 熱田貝塚.
Babai cemetery (site). 八拜墓地.
Baekche (hist. name), see *Baekje*. 百濟.
Baekje (hist. name), also *Paekche*, *Baekche*. 百濟.
Baideng (battle of) (hist. name). 白登之围, Пинчений тулаан.
Balhae (hist. name), also *Bohai*, *Bokkai*, *Bokhai*, *Palhae*, *Parhae*. 渤海, 渤海, Бохай.
barrel-vault type (kiln term.). イチジク型.
Birōsuku type (ware). ビロースクタイプ.
Bizishan (site). 鼻子山遺址.
bo bell (form/item). 搏钟.
boat bottom pit (kiln term.). 舟底状ピット.
Bohai (hist. name), see *Balhae*. 渤海, 渤海.
Bonggyeri (kiln site). 鳳溪里.
bottle oven kiln (kiln term.), see *kiln with oven floor*. 德利窯.
bowl (form/item). 括鉢, 鉢, 碗, 鉢, 碗.
broad-short kiln with oven floor (kiln term.), also *semi-downdraft kiln*, *flat kiln*, *flatland kiln*, *flatdraft kiln* / type.