15

The Beginning of Stoneware in the Japanese Archipelago

Tomoko Nagatomo

Abstract: The appearance of kilns in the Japanese archipelago dates from the end of the fourth century to the beginning of the fifth century. The author analyzes early Korean Sue ware and soft earthenware from the Uji City site during this period. The Uji City site is a regional site, and the Suemura kilns are a group of kilns controlled by the central government. The early Sue ware from Uji City site is compared with Suemura Sue ware and Gaya stoneware. As a result, it is found that the early Sue ware from the Uji City site was produced by Korean people using the soil around the site. It was also found that earthenware was produced. If we assume that kiln-fired stoneware was produced by men and field-fired pottery by women, we can understand that a small group of men and women came from the Gaya region of the Korean Peninsula. This is very different from the Suemura kiln, where a group of male artisans came from the Korean peninsula and produced Sue ware.

Keywords: Uji City site, early Sue ware, Korean low-fired earthenware, Gaya stoneware, Suemura kilns

15.1. Introduction

Stoneware kilns were introduced to the Japanese archipelago from the Korean peninsula at the end of the fourth century. In contrast to the kilns managed and operated by the central administration, the local kilns were run by a regional chief. Sakai suggest that the spread of kilns from the Korean peninsula to the Japanese archipelago took place multiple times, not only from the Gaya region of the Korean peninsula, but also from the Yeongsan River basin in Baekje and Mahan. The specific circumstances of the introduction of kilns have gradually become clearer. However, while these studies focus on kilns and kiln-fired stoneware and examine immigrants who brought kiln techniques to new lands, they do not take into account their relationship to potters who made the Korean Yeonjil (soft fired) earthenware during the same period. Another problem was the fact that the influence of technique by immigrants has been discussed without clarifying the form of pottery production on the Korean peninsula. In this chapter, therefore, I will discuss the migratory forms in the introduction of the kiln, considering the potters who made Korean Yeonjil earthenware. To this end, I will first point out that some of the Korean Yeonjil earthenware was fired openly, and then show that there are multiple forms of pottery production on the Korean peninsula. In addition, I will examine Suemura kilns as the primal kiln and Uji City site as a case study of the local pottery production. Not only early stoneware but also Korean Yeonjil earthenware excavated from the Uji City site was analyzed and archeologically examined, and it was shown that these wares were produced by potters who migrated from the Korean peninsula to the area around the site. I will show the background of two different forms of pottery production by primal kilns and local kilns during the introduction of kiln technique.

15.2. Historical background and past research on the introduction of kilns

15.2.1. The historical background of the introduction of kilns in the Japanese archipelago

On the Japanese archipelago, rice farming began in earnest around the Yayoi period (ninth century BC), and as it became established, large settlements where people gathered together developed. The regional differences in graves, such as the use of jarred coffin tombs in northern Kyushu, protruding four-cornered tombs in the Sea of Japan region and square-shaped circumscribed tombs in the Kinki region, prove that different funeral rituals were carried out in each region. In the first century, settlements were reorganized and large settlements were dismantled, but around the second century, much larger settlements appeared. The largest tombs, about 80 m in length, were built for the chiefs in each area. However, the shapes of the large tombs in different parts of the country during this period were diverse and still regional in nature. In the middle of the third century, a huge keyhole-shaped tumulus over 200 m in length called the Hashihaka Tumulus was constructed in the Nara Basin. After this time, tumulus of the same shape began to be built in other areas, and regional differences in the shape of the mounds disappeared. The funeral rituals were unified as well. The construction of a

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large-scale mound required the labor of many people, and since many valuable objects such as Chinese mirrors were buried in the mounds, it is thought that the Great King and the wealthy families connected to him were buried in the large keyhole-shaped tumuli. The largest of these tumuli was being constructed continuously in the Nara Basin in the Kinki region throughout the fourth century. The gradual spread of keyhole-shaped tumuli to the Setouchi, Kyushu, Tokai and Hokuriku regions suggests that the relationship between the central and local regions was formed over a wide area. The period in which these huge keyhole-shaped tumuli were constructed is called the Kofun period.

According to *Sangokushi* (The Chronicles of the Three Kingdoms), in 239, Queen Himiko sent a messenger to Wei with slaves and various tributes, and was given the seal of the King of Wei. There is no mention of Wa (ancient Japan) in Chinese history until the fifth century, when the five kings of Wa sent messengers and supplied tribute to China in an effort to obtain titles. Archeological evidence shows that Wa not only sent emissaries to China, but also interacted with the Korean peninsula and imported various goods and the following advanced techniques. The king and chiefs introduced horse-breeding and armor-making techniques to strengthen their military power, and gilding techniques to show off their authority with magnificent prestige goods. The kiln for Sue-ware ceramics was one of the continental techniques introduced at this time. Kiln-fired, leak-proof stoneware containers allowed for the long-term storage of liquids, and the hard, gray stoneware tableware became indispensable for feasting in the continental style during negotiations and trade.

15.2.2. Past research on kilns and stoneware

It is known that the Suemura kilns, the largest group of kilns in the Japanese archipelago, have been in continuous operation for more than 300 years, with more than 800 kilns in operation. Since it was initially believed that the kiln TK (Takakura area) 73 of the Suemura kilns was one of the oldest kilns in the Japanese archipelago, it was understood that the techniques for firing Sue ware spread to the other parts of the Japanese archipelago from the Suemura kilns, which themselves were developed with techniques from the Korean peninsula (Tanabe 1966). However, since then, even older kilns such as Yamakuma No. 1 in Fukuoka, Mitani-Saburodani Seigan kiln in Kagawa and Okugatani kiln in Okayama, have been discovered. In addition, kilns TG (Toga) 232 and 231, which are older than TK73, were discovered among the Suemura kilns (Okado 1995, 1996). The Deai kiln in Hyogo Prefecture, which predates TG232 and other kilns, was found in 1981 (Ueno 1998, Kameda 2008).

The discovery of these earlier kilns (Fig. 15.1), mainly along the Seto Inland Sea coast, has led to the mainstream understanding that kiln technique was introduced to the Japanese archipelago in a pluralistic manner (Hashiguchi 1982, Fujiwara 1992, Takesue 1993). Excavations revealed that the early local kilns were isolated and abandoned after a short time, while the Suemura kilns were continuously operated for a long time, and there was large number of them. In addition, the transmission of techniques from the Suemura group to early local kilns has been pointed out, because some of the early Sue ware in each region bears the characteristics of that made in the Suemura kilns. Therefore, the importance of the Suemura kilns has been re-evaluated (Ueno 2002). It has also been pointed out that the kilns previously recognized as early local kilns did not appear at the same time, but rather were constructed during three separate periods (Nakatsuji 2013). In recent years, a study of the distribution of early Sue ware supplied by the Suemura and Ichisuka No. 2 kiln as well as the Suita kiln has been examined using fluorescent X-ray analysis of clay (Shiraishi and Tanaka 2016).

In the Korean peninsula, not only kiln-fired white and gray hard stoneware but also red earthenware is used as cookware. This is called Korean Yeonjil earthenware. A pioneering study that analyzed the distribution and types of Korean Yeonjil earthenware excavated from the Japanese archipelago noted the presence of immigrants (Imazu 1987, 1994), followed by a comprehensive collection of Korean Yeonjil earthenware found in the Kinki region (Nakano 2007, Society of Ancient Studies 2012). It has been shown that the changes in the shape of the Japanese Haji ware (low-fired stoneware) were caused by the influence of Korean Yeonjil earthenware (Kyoshima 1994). This influence has been observed at the Kyuhouji-Nagahara site, as well as in the northern part of Kawachi and the western part of Settsu, prior to the other sites (Kyoshima 1994), even within the confines of the Kinai region, which has strong royal control (Nakakubo 2009, Nakano 2017). It was noted that there were varying degrees of impact on the local pottery manufacture depending on the site and region. Furthermore, steamers, which were introduced to the Japanese archipelago from the Korean peninsula along with a new cooking method, have been studied to determine their place of origin on the Korean peninsula, because there are clear localities (Sugii 1994, Sakai 1998, et al.).

A series of kilns have been discovered on the Korean peninsula, and a collection of kiln data is being compiled (Kang 2005, Ueno 2009, 2013, 2015). Researchers from the Honam (Lee 2008, Park 2001, Jeong 2008), Hoso (Choi 2010) and Yongnam regions (Kim 2004, Kim 2007, Park 2001) have examined the kilns in their respective localities. In the Honam region, two distinct types were found: regular kilns used for production of everyday ceramics, and a more specialized type used for firing large jar-shaped coffins (Choi et al. 2004, Jeong 2012). An analysis of ceramic-making techniques has been carried out to study the production system (Lee 2005, 2011), and the distribution area of ceramic has been examined based on the analysis of ceramic samples (Cho 2008). In order to better understand production techniques, archeologists examined stoneware and

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[Gyeonggi region: Beakje]
1 Neungsanri
2 Cheonggyeri
3 Gajaeri
4 Nongseori
[Hoseo region]
5 Yongwonri
6 Maeseongri
7 Samryongri / Sansuri
8 Gagyeongdong
9 Eungamri
10 Naseongri
11 Gwisanri

[Honam region:Mahan/Baekje]
12 Bugokri
13 Seongnamri
14 Wonheungri
15 Songcheonri16 Nodongri
17 Oryangdong
18 Gungokri
19 Daegokri
20 Mipyeongdong

[Yeongnam region:Kaya, Shilla]
21 Ugeori
22 Myosari
23 Yeochori
24 Jisadong
25 Songokdong
26 Hwangseongdong
27 Wolseong Haeja
28 Songgokdong

[Kyusyu region]
29 Yamaguma
30 Iyashiki
[Setouchi region]
31 Ichibaminamigumi
32 Mitanisaburoudani Seigan
33 Miyayama
35 Okugatani
[Kinki region]
35 Deai
36 Suita
37 Uemachidani
38 Ichisuka
39 Suemura
40 Uji city site (not kiln site)

Figure 15.1. Korean kilns in fourth and fifth centuries and early Japanese kilns.

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kilns without Yeonjil earthenware that was fired openly (Kim 1988, Park 2003, Tsuchida 2016, Cho 2016). So far, while the provenance of early Sue ware with a distinctive regional color in the Korean peninsula has been investigated, the Yeonjil earthenware with a general regional color has been studied as evidence for the process of establishment of the Korean people who came to the Japanese archipelago with their tools of daily use. Thus, although both early Sue ware and Yeonjil earthenware originated from the Korean peninsula, they have been discussed for different purposes, separately, which is a problem. A comprehensive examination of early Sue ware and Yeonjil earthenware would provide clues to the patterns of visiting groups of people with pottery-making techniques. For this purpose, it is necessary to examine the pottery production system of the Korean peninsula by way of analyzing how the productions of ceramics and Yeonjil earthenware were combined.

15.3. Pottery production in the Korean peninsula

It was during the first century BC that kilns were introduced to the Korean peninsula. The first low-temperature flat kilns were introduced to the Korean peninsula from northern China, and later, under the influence of the long-bodied kilns in southern China, long, sloped kilns were constructed, which were used to fire pieces at high temperatures (Chapter 1, Section 1). High-temperature kilns were being operated in the southern part of the Korean peninsula when kilns spread from the Korean peninsula to the Japanese archipelago during the fourth and fifth centuries. Focusing on the fourth and fifth centuries, we will examine the production pattern of stoneware and earthenware in the Korean peninsula in view of the location of the kilns and the number of kilns that formed a group.

There are four types of groups of kilns in Baekje. The first is a large group of kilns consisting of more than seven, such as the Samryongri/Sansuri sites in Jincheon and Naseongri site in Yeongi. The second is a small group of kilns. Both of these types are located far away from the settlement they serve. The third consists of a few kilns in the settlement itself. Last are special kilns for large jar coffins, like the one at the Oryangdong site in Naju.

In Silla, there are large groups of more than 40 kilns, such as the Seongokdong site in Gyeongju and the Uksudong site in Duegu. The other pattern is a relatively smaller group with up to six kilns. There is no settlement around these kilns. In some cases, there are kilns at the iron-making site.

In contrast to Baekje and Silla, in Gaya there are only small groups with one to four kilns. However, because of the large number of stoneware buried in the tumuli at Silla and Gaya, it is expected that large group of kilns will be found in Gaya in the future.

Failed stoneware was unearthed in a discarded kiln. Along with this, a small number of Yeonjil earthenware pieces were also discovered within the same kiln. It was assumed that both the stoneware and the Yeonjil earthenware were fired in the same kiln[1] (Lee 2005, Tsuchida 2016). However, the number of Yeonjil earthenware pieces is very small compared to the amount of stoneware excavated from the kiln. Since rice was cooked in each house in the settlement, cooking utensils were required in large quantities. It is difficult to imagine that all of the rice-cooking utensils, which are oxidation-fired potteries, could be supplied based on the amount detected in the kiln remains. Observations of long pots excavated from settlements (Singyeom sites in Gwangju and Taemokri sites in Gwangju) showed distinctive black spots (see Fig. 15.6). These are traces of carbon from the fuel that was placed under and covered the earthenware to seal it, when it was fired openly. This cannot occur in kiln firing, where the fuel does not come in contact with the stoneware. However, some steamers were burned in the kiln; most cooking utensils are burned openly. Since open-fired earthenware has strong fire resistance, it is plausible that these cooking utensils were fired openly.[2] In the Korean peninsula, there are differences in polity and society between Baekje, Silla and Gaya (Yamamoto 2017). Therefore, it is necessary to distinguish these differences when we discuss pottery production, namely which are controlled by king and loyal people. On the other hand, the coexistence of kiln firing and open firing is common in the pottery production systems of Baekje, Silla and Gaya.

How can we recognize the remains of open-fired pottery production? Because of the use of anvils for forming earthenware into a mushroom shape, we can identify the places where these are found as pottery-making sites. Therefore, it is assumed that only open-fired earthenware was produced in settlements where anvils were found but no kilns have been located in the surrounding area.

An analysis of the kilns and the settlements where the anvils were found reveals the following types of pottery production in the Korean peninsula: Type 1 production was only concerned with producing stoneware. No pottery was produced here. A group of kilns was built far from the settlement, including a large group of kilns (Type 1A) and a small group of kilns (Type 1B). Another type of stoneware production is concerned with pottery production. A small number of kilns operated in a settlement in which anvils were found has been categorized as Type 2. Type 3 is the

[1] In the Baekje region, there is an example of a stoneware kiln and an iron-making site located in the same water system. Windpipes, which are essential for the operation of the iron-making kiln at the Seokjangri site in Jincheon, were made at the stoneware kiln of the Samryongri /Sansuri sites in Jincheon (Nagatomo 2008).

[2] Lee Seongju understands that in Gaya and Silla, after the fifth century, the field-firing technique disappeared and all stoneware and Yeonjil earthenware was fired in kilns (Lee 2006). Tsuchida Junko also assumes that Yeonjil earthenware from Baekje is kiln-fired, but the possibility of open-fired earthernware is also considered, based on the case of a long-bodied boiler from Namsan site No. 4 pit with burnt earth in Jeongeup, which was excavated with charcoal (Tsuchida 2016).

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Table 15.1. Pottery production in Korean Peninsula

Production system	Archaeological site	stoneware production	eartern ware production
Specialising in stone wares	Large group of kilns away from the settlement	●	×
	Small group of kilns away from the settlement	●	×
Production of both stone wares and earthenware	One or two kilns in the settlement	●	●
Production of earthenware only	Settlement without kilns but with tools for pottery making	×	●

case of a settlement in which anvils were found, but no kilns were discovered in the area. According to the author's previous analysis of the distribution of kiln clusters and anvil sites in the Hoso area (Nagatomo 2008, fig. 4-26), at least six sites are classified as open-fired pottery production settlements. Since anvils were not found in all settlements, it is understood that some settlements did not produce stoneware. Thus, three types of production existed (Table 15.1): stoneware production, which includes both a large and a small kiln group; stoneware and Yeonjil earthenware (cooking utensils) production; and only Yeonjil earthenware (cooking utensils) production. Large groups of kilns with only stoneware would have been directly controlled by the central government in some cases.

15.4. The introduction of kilns in the Japanese archipelago

The following is an examination of the group of people who transmitted kiln technique to the Japanese archipelago, with the patterns of stoneware production in the Korean peninsula in mind.

15.4.1. Primal kiln: Suemura Obadera kiln TG232 in Osaka

The Suemura kilns, located in the southern part of Osaka, are the largest groups of kilns from the Kofun period. The Izumi Mountains stretch from north to south on the east of the Osaka Plain, and gently sloping terraces rise up from the plain to the hills, derived from the mountains, and then to Osaka Bay in the west. A number of rivers flow from the mountain range, forming valleys on the hills and terraces. The Suemura group of kilns lies on a terrace spreading out from the bottom of the hill, while the TG232 kiln, the earliest kiln in this group, is located close to the plain. In the vicinity of the Obadera site, where the TG232 kiln is located, is the Fushio site, which is a settlement inhabited by the manager of the kiln complex, with an accompanying large, special house in which managers lived and a warehouse. It is also worth noting that the Daisen Tumulus of the Great King, the largest of the Mozu Tumuli Group, is located about 6 km north of the Obadera site.

More than 800 kilns have been detected in the Suemura group, and it is estimated that there were more than 1000 kilns in the area at the time. The kilns were continuously operated for more than 300 years, from the end of the fourth century, when they were first introduced to the Japanese archipelago, to the end of the 7th century. The Suemura kilns are located next to the tumulus of the Great King, and the number of kilns in operation is far greater than that seen in other groups of kilns in the Japanese archipelago, so it is understood that the Suemura group of kilns was directly operated by the Great King.

Early Sue ware. The amount of Sue ware unearthed from the TG232 kiln dump is very large, approximately 1400 containers (Okado 2005). A count of vessel types by the number of pieces at the mouth rim show that it includes 51 percent large jars, 16.5 percent pots, 10 percent vessel stands, 10 percent tall cups, 8 percent small and short-necked jars, 2 percent lids, 2 percent bowls with handle and small jars with covered legs, and 0.5 percent cups and bowls. We know that storage tools and tableware were burned in kiln TG232. In addition, kiln furniture was also excavated. Most of the Sue-ware pieces are very similar in design and form to Korean stoneware and were most likely made by craftsmen who came from the Korean peninsula. It is believed to be one of the earliest kilns in the Japanese archipelago because its form and design resemble Korean stoneware of the late fourth or early fifth century, and it has no original characteristics of Sue ware made in the Japanese archipelago. The vessel stand has characteristics of the Nakdong River area in the southeastern part of the Korean peninsula, and the bowl with handles has characteristics of the areas west of the Nakdong River, such as Haman and Masan (Okado 2005). There are numerous types of tall cups. Small wide-mouth pots and small jars with hole were produced in Honam in the southwestern part of the Korean peninsula. It is thought that craftsmen from several regions were invited to make the Sue ware, which has the characteristics of several areas: the border area between Gaya and Silla (Nakdong River area), Gaya (Haman and Masan) and Mahan (Honam).

A small amount of Korean Yeonjil earthenware and Haji pottery was found at the kiln dump. The reporter believes that the Korean Yeonjil earthenware was burned in the kiln and the Haji pottery was not, but instead were brought in (Okado 2005: 113). This will be discussed below.

15.4.2. Local pottery production: a case study of pottery from the Uji City site in Kyoto

The amount of failed stoneware unearthed from the central Suemura kiln TG232 is enormous, indicating that the potter

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produced large quantities of Sue ware from the time of kiln introduction onward. On the other hand, it is assumed that the production volume by local kilns was lower, because the number of failed potteries discarded in the local kilns was less than that of the central Suemura kiln. A small-scale kiln is difficult to find. Therefore, if there are no kilns around where early Sue ware was excavated, it is not easy to determine where it was made. Another problem is that the relationship between the craftsmen of stoneware and potters of Yeonjil earthenware cannot be determined by analyzing only artifacts from the kiln, because Yeonjil earthenware was rarely found at kiln sites. Therefore, we analyzed early Sue ware and Korean Yeonjil earthenware from the Uji City site in Kyoto that was found in a ditch. Alongside the Sue ware, pieces of wooden tools were excavated, and later dated by dendrochronology to AD 389.

The Uji City site is located in the eastern part of the Kinki region, which was a central area in the Kofun period, and is about 60 km away from the Suemura kilns. The Uji River from the east, the Kizu River from the south and the Kamo River from the north flowed into Ogura Pond, and the Yodo River flowed from this pond into Osaka Bay. The Uji City site is situated near the confluence of the Uji River and Ogura Pond, which is a key point of interchange on the route to the east. Early Sue ware, Yeonjil earthenware and Haji ware were excavated from the dich of the Uji City site.

Early Sue ware. In terms of the composition of the pottery excavated from the Uji City site, early Sue ware was estimated to account for 12 percent, Yeonjil earthenware for 30 percent, and Haji ware for 58 percent, so the ratio of early Sue ware and Yeonjil earthenware to the total was extremely high at 42 percent (Hamanaka and Tanaka 2006). Early Sue ware consisted of tableware such as tall cups and bowls, and storage tools such as jars, while Yeonjil earthenware consisted of cooking tools such as flat-bottomed pots, steamers and boilers. Since early Sue ware has been described in detail by Ha Seungcheol (Ha 2005), I will simply summarize the results here. Yeonjil earthenware was reported by Hamanaka Kunihiro and Tanaka Motohiro (Hamanaka and Tanaka 2006, 2008), and the results of the author's observations are also presented.

The covered tall cup (Fig. 15.2: 4–6) is similar to stoneware from the Gime region, which is considered to be the Gimhae Gaya. The uncovered tall cup (Fig. 15.2: 8) and the cup (Fig. 15.2: 2) are similar to ones from the Sacheon, Jinju and Goseong, which are considered to be Small Gaya. The cylindrical vessel stand (Fig. 15.2: 3) and the cup-shaped vessel stand (Fig. 15.2: 9–11) are also similar to Gaya ware. While the small jar with hole was a common shape in Mahan, the round-bottomed one, as shown in Fig. 15.2: 1, is similar to the type in the Kaya region.[3] Sue ware from the Uji City site has a strong affinity with Gaya stonewares. Among them, the tall cup shown in Fig. 15.2: 8 is similar to one found in Gaya from the late fourth century, when the stoneware regionalism became apparen[4] It is consistent with the fact that the felling date is coterminous with the wood tools of AD 389.

Yeonjil earthenware. Steamers and flat-bottomed pots accounted for 96 percemt of the total of Yeonjil earthenware (Hamanaka and Tanaka 2006), and many of them were found to be cooking utensils. The outer surface of the flat-bottomed pots (Fig. 15.2: 12) were beaten and have variety patterns on the surface, such as lattice-grained, rope, parallel-grained and ungrained. Most Yeonjil earthenware has a weak lateral stroking technique on the inside, where traces of the anvil are visible, but other pieces have a strong lateral stroking technique. The area around the bottom of the inner surface is adjusted with a finger nudge. A characteristic feature is a trace cut by the lateral spatula on the lower part of the body (Fig. 5.2: 12). This is a production technique that spread from the Lelang commandery in the northern part of the Korean peninsula to the southern part of the peninsula. It is assumed that the pots were made by people who came from the Korean peninsula. With the exception of one, the flat-bottomed pots are covered with soot and scorch marks, indicating that they were used and discarded. Fragments of the bottom and the rim of a long-bodied boiler were found. The bottom piece was adjusted by beating with a rope-pattern paddle. There are multiple mouth-rim fragments, with both lattice and rope strikes identified. Several steamers were identified, and the bottom of the steamer, reconstructed to perfect form (Fig. 15.2: 13), consists of a large central hole and a number of smaller holes around it. This bottom is the same as that of the steamers in western Kaya (Small Kaya) and westward (Cho 2016). However, its mouth rim is bent outward, which is a characteristic of the steamers from the eastern part of Gaya to the Silla region. Therefore, the origin of the steamer from Uji City site is the middle of eastern and western part of Gaya (Anra Kya). It can thus be stated with confidence that both early Sue ware and Yeonjil earthenware are strongly related to the Gaya region.

15.4.3. Results of scientific analysis

If the stoneware and earthenware excavated in the Japanese archipelago were made by Korean potters, the form and design of the pottery would be the same as Korean stoneware and earthenware. As a result, the form and pattern of the stoneware and earthenware can help estimate the place of origin of the potter, but

[3] However, the Gaya small jars with hole are supposed to be from the fifth century onwards (Ha 2008). There is also a view that the Japanese archipelago is the place of origin (Nakakubo 2017). The double mouthparts are gently bent, short and thick from the neck to the mouthparts without steps, which makes it one of the earliest examples of the small jar with hole in the Japanese archipelago.

[4] Suggestions were made by Mr. Ha Seungcheol.

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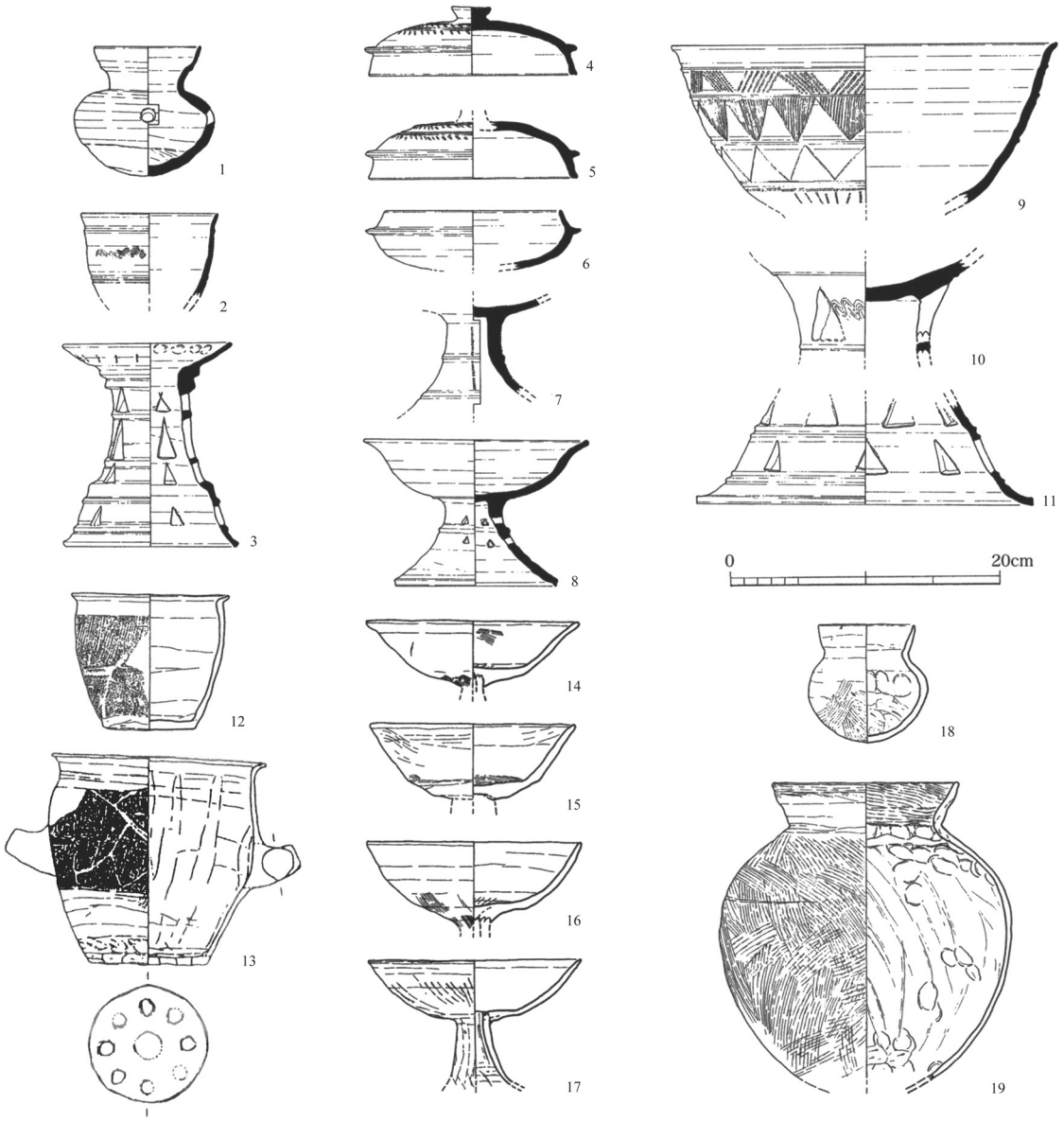


Figure 15.2. Early Sue ware (1–11), oxidation-fired pottery (12, 13) and Haji ware (14–19) from Uji City site (Hamanaka and Tanaka, 2006, Ha 2008).

it is not possible to determine where the pottery was made. Therefore, we analyzed the clay of the pottery and estimated its area of production. First, Kim Gyuho conducted X-ray fluorescence analysis of early Sue ware of the Uji City site (Nagatomo, Nakamura and Kim 2016). Then, Mitsuji Toshikazu conducted X-ray fluorescence analysis and X-ray diffraction, focusing on six elements, to compare Yeonjil earthenware and Haji ware (Arakawa, Mitsuji, and Nagatomo 2016).

Early Sue ware. An analysis of the early Sue ware from the Uji City site is shown in Fig. 15.3. Fig. 15.3: 1 shows a graph comparing clay used in stoneware from the following sites: kiln TG 232, the Uji City site and Hayagari kiln (kiln No. 1 and No. 2), which is located near the Uji City site and dates to the seventh century. So, we can recognize the local stoneware data as stoneware from these kilns. The principal analysis revealed that the early Sue ware of the Uji City site showed no overlap of the principal component distribution with that of kiln TG-232, and is closer in this regard to that of Hayagari kiln No. 2. Fig. 15.3: 2 is a graph comparing stoneware excavated from Korean peninsula, such as from Daseongdong tumulus and Mangdeok site in Gimhae and Dandeokri tumulus in Jinju, with early Sue ware excavated from Japanese archipelago, such as from the Uji City site, kiln TG232 and the Hayagari kiln. The early Sue ware excavated from the Uji City site differs greatly from the Gaya stoneware from the Korean peninsula, so it is difficult to believe that this Sue ware was brought from Gaya. Therefore, it is most likely that the early Sue ware from the Uji City site was produced in the vicinity of the site.

Nagatomo, Tomoko, Maria Shinoto, and Daisuke Nakamura. *Kilns In East and North Asia: The Adoption of Ceramic Industries.*
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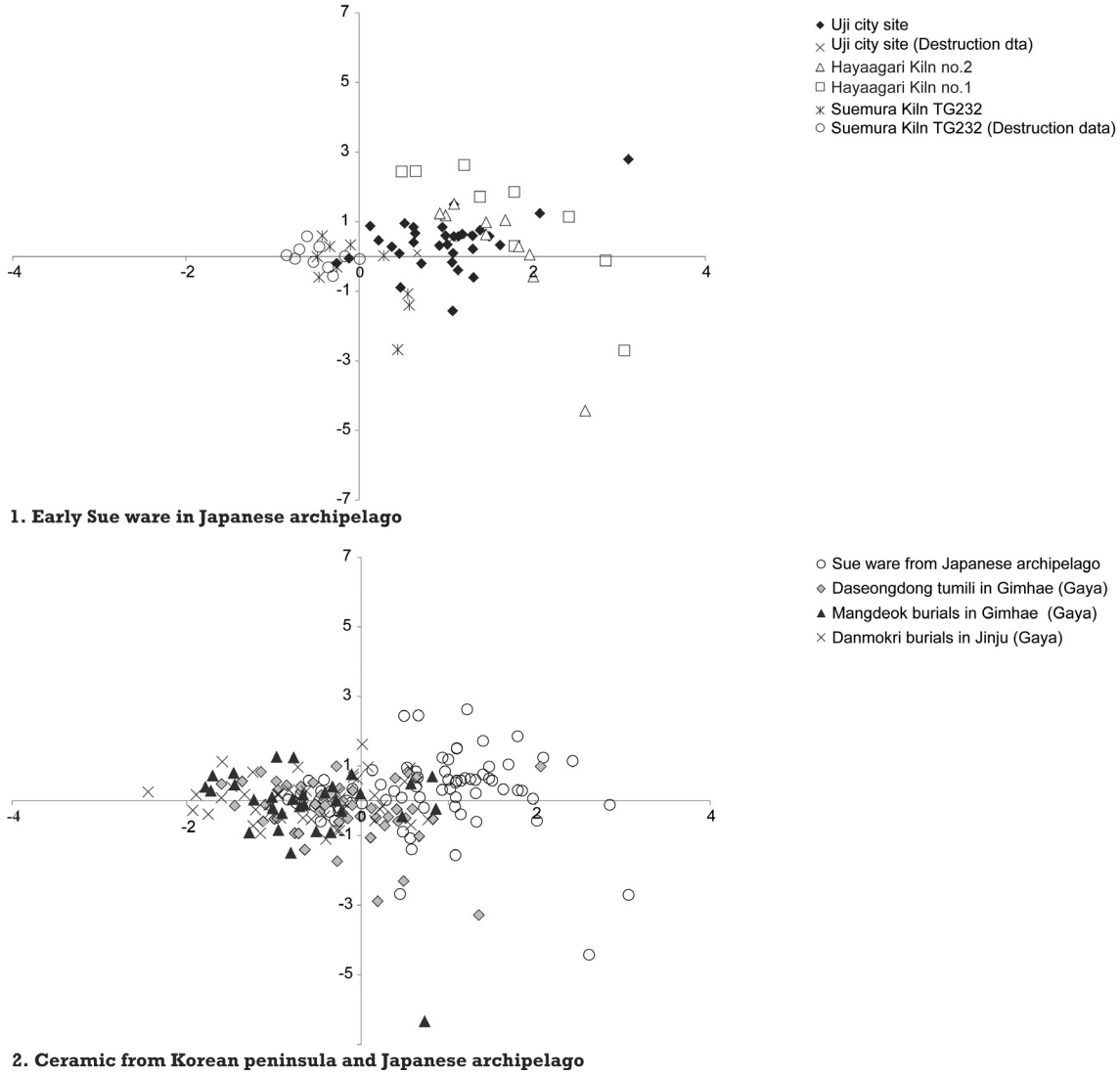


Figure 15.3. Principal component analysis (Nagatomo, Nakamura and Kim 2016).

Yeonjil earthenware. The results of the analysis of Yeonjil earthenware and Haji ware are shown in graphs in Fig. 15.4. Fig. 15.4: 1.2, 5 and 6 are graphs of Haji ware, and Fig. 15.5: 3.4, 7 and 8 are graphs of Yeonjil earthenware. Each graph shows the relationship between the two elements in Haji ware and Yeonjil earthenware. Fig. 15.4: 1 (correlation between potassium and calcium) and 2 (correlation between rubidium and strontium) show that the Haji ware shows a certain degree of unity with the exception of references 15 and 20. Therefore, the concentration of these dots shows us where Haji ware made locally, and the results were compared with Yeonjil earthenware (Fig. 15.4: 3 and 4). The Yeonjil earthenware was confined to the area of local ware with the exception of Samples 4 and 12, indicating that the Yeonjil earthenware was similar to the clay of the Haji ware. Furthermore, the correlations between potassium and rubidium (Fig. 15.4: 5 and 7), and calcium and strontium (Fig. 15.4: 6 and 8), were examined. In these results, the values of Yeonjil earthenware and Haji ware show close correlation. However, since the distribution area is somewhat displaced, it is presumed that the clay was not collected at the exact same site, but rather at locations close to each other.

The results of the scientific analysis of the early Sue ware and Yeonjil earthenware excavated from the Uji City site can be summarized as follows: (1) Although the kilns still have not been detected, the early Sue ware from the Uji City site was produced in the vicinity of the site. (2) Archeological investigations have shown that the Yeonjil earthenware was produced by people from the Korean peninsula, as it has not been integrated with the techniques of the Haji ware. Therefore, it can be concluded that both the early Sue ware and the Yeonjil earthenware were made in the vicinity of the Uji City site by people from the Korean peninsula.[5,6,7]

[5] In the kiln with separate combustion and firing sections, black spots do not form due to carbon deposits from fuel. However, in the case of large jar coffins excavated from the Oryangdong site in the Korean peninsula, there were cases of black spots on the coffins fired in the kiln. This is thought to be due to the fact that the bottoms of the coffins were covered with fuel to stabilize them.

[6] Short-necked pots appearing in the Proto-Three Kingdoms period may be either open-fired or kiln-fired in the period of their appearance.

[7] Another aspect of the parallels between Yeonjil earthenware and early Sue ware excavated from sedimentary layers and houses in the valley

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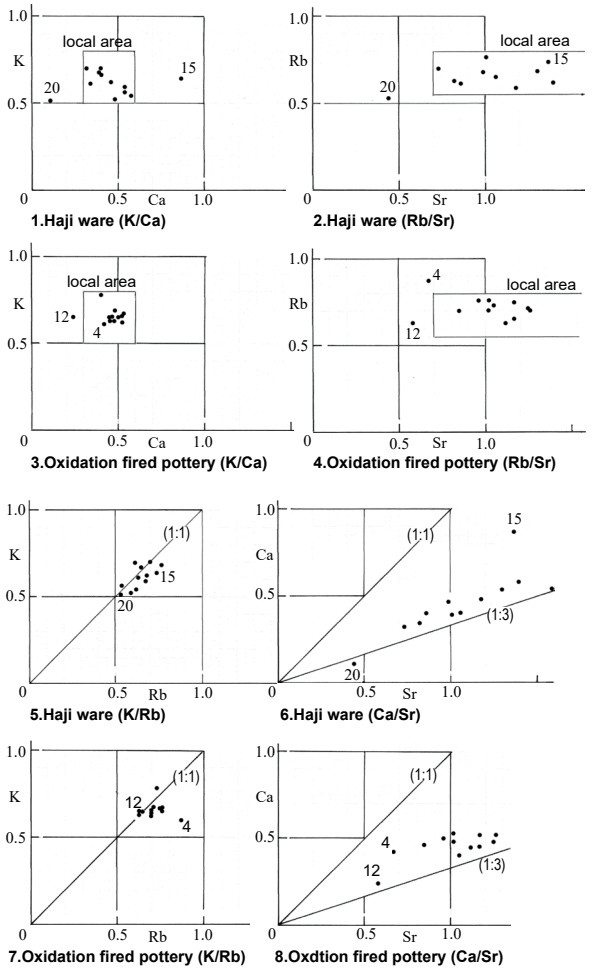


Figure 15.4. Analysis of Haji ware and oxidation-fired pottery from Uji City site (Arakawa, Mitsuji and Nagatomo 2016).

15.5. Conclusion

The extent of stoneware production can be assumed based on the size and continuity of the kiln and the number of discarded failed pieces. As mentioned above, looking at the number of failed pieces discarded in the kilns, a large amount of Sue ware was found in the central Suemura kiln, and a small amount in the local kilns, indicating a difference in production volume between the central and local kilns. From the differences in the amount of stoneware production by each kiln, it may be possible to infer differences in the scale of the number of potters who came to the Japanese archipelago. On the other hand, what about the oxidation potters who came to the Japanese archipelago? Long-bodied boilers of Korean descent, along with early Sue ware, have been excavated from the valley around the TG232 kiln in Obadera site (Fig. 15.5: 2). These long-bodied boilers are covered with black spots, indicating that they were burned openly. Very interestingly, they show numerous lines that are not usually found on boilers. Several boilers with these characteristics have been excavated. Since the multi-stranded line design is usually found on short-necked pots fired in kilns (Fig. 15.6: 1), it is possible that the kiln-firing craftsmen may have made these cooking utensils as well. The other boilers were burned by the kilns, as evidenced by their hard, gray texture. After arriving in the Japanese archipelago, it was the stoneware specialists who made the cooking utensils for boiling rice. Therefore, it is understood that the people who transmitted their skills to the Suemura kilns were mainly stoneware specialists, not including the Yeonjil earthenware makers.

On the other hand, there is no evidence for the stoneware technique in the Yeonjil earthenware from the Uji City site, but rather for a Korean technique for Yeonjil earthenware. This is also the case in other regions. Since most of the early Sue wares and oxidation fired potteries at the Uji City site have been found in Gaya, it is assumed that the group of immigrants included oxidation potters and stoneware specialists from Gaya.

In other words, the craftsmen who were invited to the Suemura kilns were a specialized group engaged in the production of stoneware in the Korean peninsula, while the group that came to the Uji City site was a composite group of stoneware potters with kiln technique and oxidation-fire potters who burned cooking utensils openly. Some sites in the Kinki region are known to have contained almost no early Sue ware, just Yeonjil earthenware. Interestingly, some of these sites include migrant groups with horse-herding techniques or ironware specialists. In that case, it is likely that the Yeonjil earthenware makers accompanied a group of people with skills other than pottery to the Japanese archipelago. As mentioned above, there are three types of pottery production on the Korean peninsula: Type I, in which only stoneware is produced; Type II, in which both stoneware and Yeonjil earthenware are produced together; and Type III, in which only Yeonjil earthenware is produced (Fig. 15.7). If we understand the above, we can see that the pattern of migratory groups to the Japanese archipelago is strongly influenced by the diversity of production systems on the Korean peninsula. Concretely, it is suggested that a Type I group migrated to the Suemura kiln, a Type II group to the Uji City site, and a Type III group of oxidation-fire potters who migrated with non-pottery technique.

In considering the gender of the potters, Tsude Hiroshi has an interesting suggestion. He presented a graph of the gender of people engaged in different types of occupations, based on the ethnographic statistics examined by Murdoch (Tsude 1989). The results showed that a high percentage of women were engaged in pottery production for the main purpose of self-consumption. Specifically, 13 of the 106 cases had a male main role, 2 cases where the male was in the main role and the female was in a supporting role, 6 cases where both men and women were involved, 8 cases where the female was in the main role, and 77 cases where only women were in the main role. The total number of

topography adjacent to the kiln TG232 kiln suggests that the Sue ware craftsmen made the Yeonjil earthenware (Ōtsubo 2010).

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Figure 15.5. Long-bodied boiler with black spots.

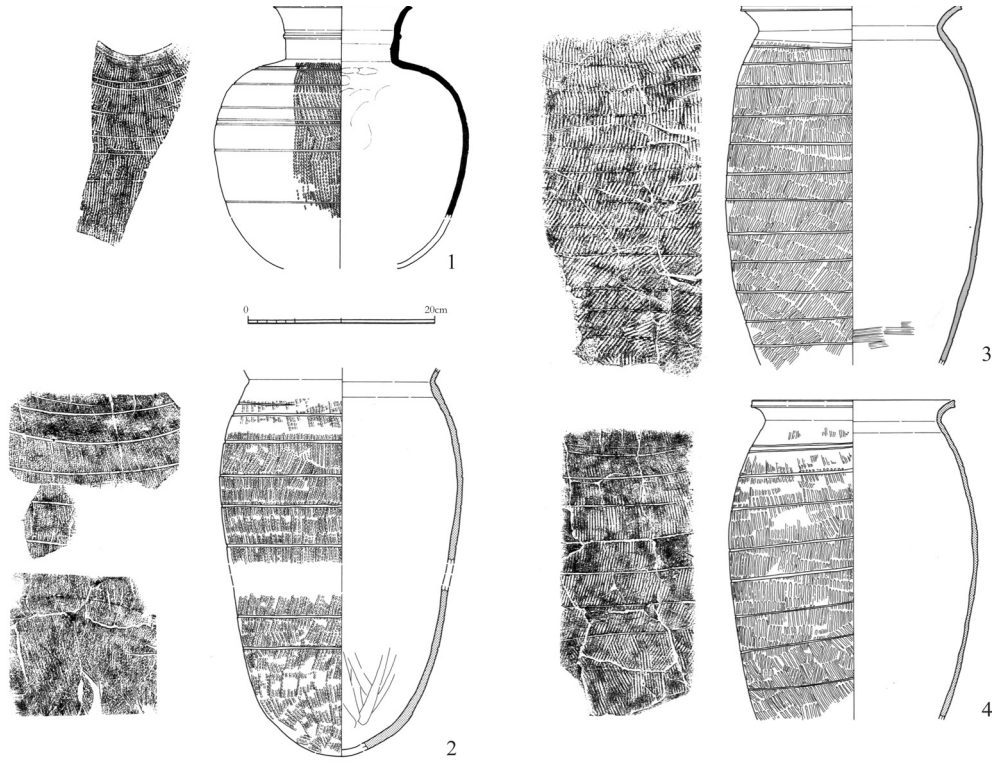


Figure 15.6. Short-necked pot from kiln TG232 (1) and long-bodied boilers from the valley around kiln TG232 (2–4) (Okado eds. 1995, 1996).

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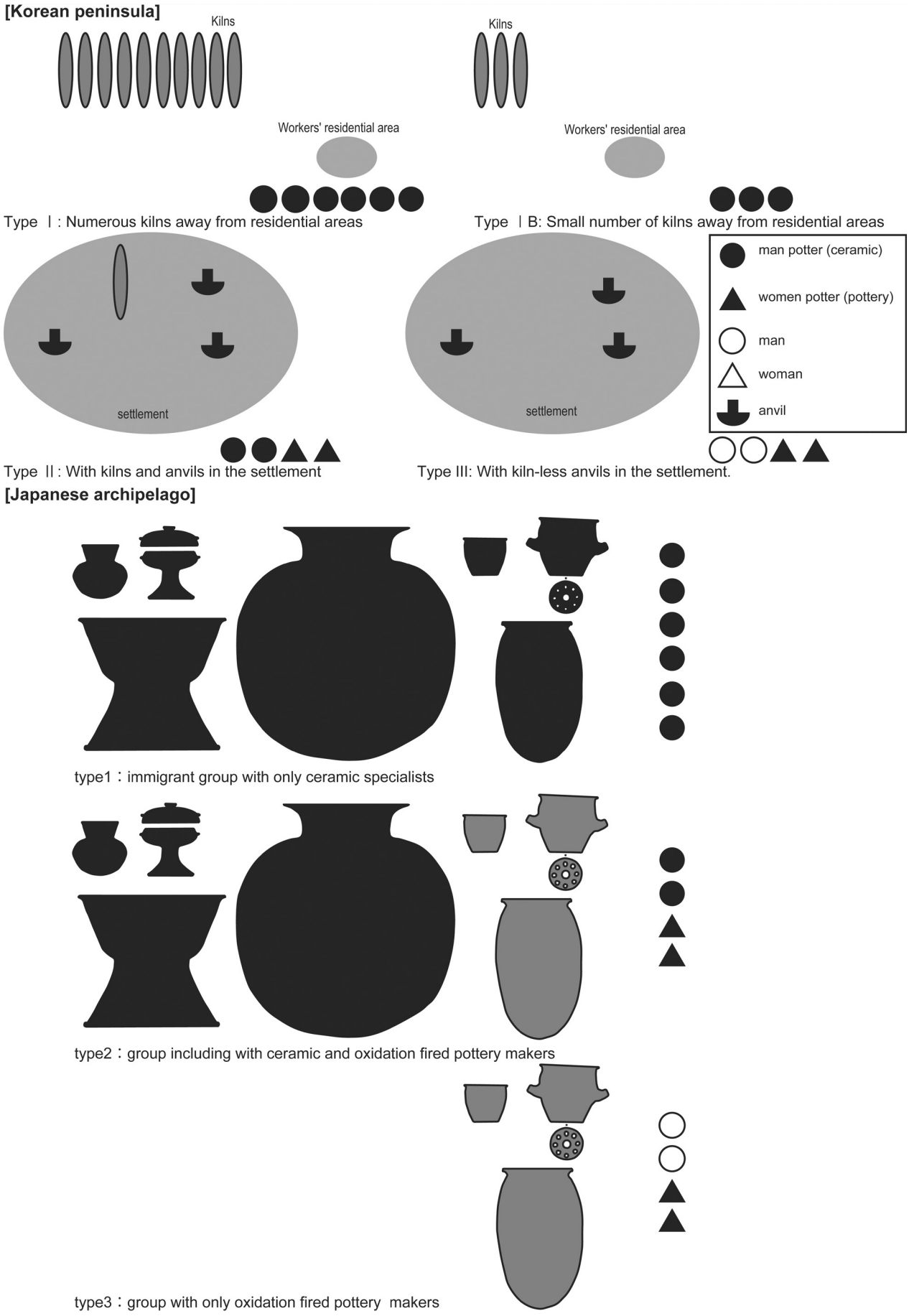


Figure 15.7. Model of pottery production system.

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cases of predominantly female and female-only cases are 85, indicating an 80 percent female majority. He also pointed out that according to ancient Japanese literature, women were the makers of Haji ware, and men were charged with heavy labor, such as digging, carrying and pounding earth, fetching firewood, preparing and carrying straw. Women shared the responsibility for making Haji ware, which was used at the shrines, and men made Sue ware.

Early Sue ware excavated from Suemura kiln TG 232 includes some tall cups that have elements in common with Haji ware (Okado 1995: 276, 277). Therefore, in the beginning of stoneware production, women skilled in making Haji ware assisted in forming Sue ware. Basically, however, the techniques of Haji ware and Sue ware did not merge. Haji ware was rather strongly influenced by Korean Yeonjil earthenware. Haji-ware pots were influenced by long-bodied Korean boilers, in turn becoming longer themselves, and eventually people used them as boilers as well. Therefore, it is assumed that Sue ware fired by kilns was produced by men and Haji ware by women, and even on the Korean peninsula, stoneware was produced by men and Yeonjil earthenware by women. The three production patterns are very interesting to consider, including the division of roles between men and women. We can assume a division of roles and production patterns: Type 1 is a group of women-only specialists. Type 2 is a group of both stoneware-making men and open-fired-earthenware-making women, and Type 3 is a group of men with no pottery skills and women with pottery-making skills. The king and wealthy families of the Japanese archipelago invited and hired a group of stoneware specialists and formed the Suemura primal kilns. On the other hand, it is thought that some families migrated to the Japanese archipelago from a community of men who made stoneware and women who made open-field earthenware, and this was an example of an immigrant group of local kilns. The local chiefs of the Japanese archipelago invited them to produce Sue ware, and at the same time, they adopted a new cooking style that require Yeonjil earthenware.

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16

Structure of Sue-Ware Tunnel Kilns on the Japanese Archipelago

Masaaki Kidachi

Abstract: The author examines the structure of *anagama* kilns (long-chamber kilns) introduced to the Japanese archipelago, as follows. During the early period in the Japanese archipelago, *anagama* kilns could be divided into the sunken kiln and the semi-sunken kiln. The choice of sunken or semi-sunken kiln depended on the topography and geology in which the kiln was constructed. Sunken kilns are not easy to heat up, but have the characteristic of being difficult to cool. On the other hand, semi-sunken and surface kilns are more efficient at raising temperatures, but have the feature that the temperature in the firing chamber rises and falls remarkably due to the small heat-storage capacity of the kiln itself. In the second half

Keywords: Sue-ware tunnel kilns, sunken kilns, semi-sunken kilns, surface kilns, S-F angle

16.1. Introduction

Bernard Leach recognizes that tunnel kilns were a technological development unique to the East, while bottle oven kilns developed in the West (Leach 2020 [1939]: 285). However, Hirotsugu Sekiguchi states that "unroofed kilns," an archetype of bottle oven kilns, have had a longer history in China than in West Asia and Europe (Sekiguchi 1983). Yoshiki Fukasawa concludes that unroofed kilns originated in northern China in prehistoric times (Fukasawa 2011) and then spread to southern China. This suggests that tunnel kilns originated in southern China later than unroofed kilns and developed in parallel with the latter. The two different kiln traditions originated in different areas but coexisted in East Asia for a long time. It should also be remembered that, as Leach points out, while unroofed kilns developed into bottle oven kilns in the West, the former continued to exist in the East while maintaining their archetypal characteristics.

On the Japanese archipelago, these two types of kilns have become known as examples of folklore (Fig. 16.1a). From prehistoric times until the present day, pottery on the Japanese archipelago has developed under the strong influence of pottery in mainland China and the Korean peninsula. However, since the tradition of kilns deriving from unroofed kilns has not been thoroughly examined in the historical context of East Asia, it has not been clearly positioned in the history of pottery on the Japanese archipelago. In China, many remains of unroofed kilns built on the ground have been found in Beijing's Longquanwu kiln site, which dates back to the tenth to twelfth centuries (Beijing Municipal Institute of Cultural Relics 2002: 54–80), and an increasing number of unroofed kilns have thus been surveyed. Meanwhile, unroofed kilns after the development of tunnel kilns have not been fully examined. The relationship between the historical development of unroofed kilns and that of tunnel kilns in mainland China is a crucial subject for academic exploration. Furthermore, that relationship in mainland China is thought to have had a major impact on the development of kilns in the Korean peninsula and the Japanese archipelago.

This article introduces the results of examinations from the perspectives of folkloric archeology and experimental archeology of the structure of tunnel kilns on the Japanese archipelago, with the main focus placed on Sue-ware kilns dating back to the fifth to eleventh centuries (Fig. 16.1b).

16.2. Structure of Sue-ware tunnel kilns on the Japanese archipelago

The Japanese archipelago saw the development of Sue ware after the introduction of ceramics from the Korean peninsula in the fourth and fifth centuries. Sue ware is a kind of stoneware that is thought to have been spread in a political manner in parallel with the formation of the ancient Japanese state. It was produced within the ancient state based politically in present-day Nara Prefecture roughly between the fifth and eleventh centuries. Since the firing process of Sue ware involved reduction cooling, Sue ware ceramics are generally in gray or bluish gray. The firing temperature is thought to have peaked at 1150°C. While the way of finishing the firing process varied over time, recent findings in experimental archeology suggest that Sue ware was in fact often fired at lower temperatures than 1150°C. Due to the structure of tunnel kilns, temperature differences between various spots in them cannot be avoided. Therefore, a certain fluctuation in firing temperatures was inevitable (see Chapter 1, Section 1.3.3).

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