Porcelain Manufacturing of the Pre-Qin Period in Zhejiang

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Abstract: This essay offers a perspective on the main kiln complexes in the Jiangnan region. Among them, the Dongtiao River Basin, centered on the Deqing area, was outstanding in its antiquity, the size of its kiln complexes, its high firing temperatures and the quality of its products, and occupied a highly significant position in the history of Chinese ceramics. Particularly crucial are the following research results: a) providing a material basis for exploring the origin, development, and maturity of porcelain; b) finding the place of origin for some of the proto-porcelain products unearthed anywhere; c) providing a wealth of material information for the establishment of the chronology of proto-porcelain in the Pre-Qin period in Taihu area; d) enriching the research on the archeological culture of the Shang and Zhou Dynasties in the Taihu area. These led us to realize that the firm technical basis for the emergence of developed celadon in the Han Dynasty was established in this area.

Keywords: Proto-porcelain, dragon kilns, Deqing, Dongtiao River Basin, celadon

6.1. Introduction to proto-porcelain of the Pre-Qin period

The Pre-Qin period saw the origin and early development stage of porcelain; the porcelain of that period is called proto-porcelain, another name for original porcelain. Because proto-porcelain is mostly celadon, it is sometimes called proto-celadon.1 Proto-porcelain or proto-celadon is generally considered to be the celadon product in its original state, made of a porcelain clay body, coated with lime glaze, and fired at a high temperature above 1100°C. After the clay body has sintered, it is grayish white or brown, and it can make a crisp sound when it is tapped (Feng ed. 1998). Proto-porcelain is the product of the transition from pottery to porcelain. It can also be said that proto-porcelain is porcelain that is still at a lower stage. In the practice of firing pottery, the ancient Chinese people created the proto-porcelain while constantly improving the selection and treatment of raw materials as well as increasing the firing temperature and glazing the surface of the pottery (the Chinese Ceramic Society ed. 1982). Proto-porcelain appeared in the late Xia Dynasty, matured in the early Shang Dynasty, developed initially in the early Western Zhou Dynasty, flourished in the early Warring States period, and declined in the late Warring States period.2 It was distributed in Henan, Hebei, Shandong, Shanxi and Gansu in the north, Zhejiang, Jiangsu, Jiangxi, Hubei, Hunan, Fujian and Guangdong in the south and other areas, mainly concentrated in Zhejiang and other areas adjacent to Zhejiang, including southern Jiangsu, southeast Anhui, northeast Jiangxi and northwest Fujian (Fig. 6.1). It has been widely unearthed in the tombs and ruins of those periods. Among proto-porcelain vessels, ritual vessels accounted for a considerable proportion, including the Zun vessel, Dou vessel, tripod, Gui vessel, You vessel, Tilianghe kettle and Jian vessel. In the Warring States period, there appeared similibrone musical instruments, such as the Yong bell, Bo bell, Chunyu, Goudiao and Zheng, as well as weapons, tools and farm implements, etc., which covered almost all kinds of bronze wares, except for chariot fittings and harnesses. There were also some daily utensils.

The proto-porcelain kiln sites of the Pre-Qin period, in which the proto-porcelain was fired, are currently concentrated in the south, mainly in Zhejiang, including Jiangxi, Fujian and Guangdong, which are adjacent to Zhejiang. Throughout China, up to the present, proto-porcelain kiln sites have been found in Zhejiang, Jiangxi, Fujian, Guangdong and other provinces.

6.2. Proto-porcelain kiln sites of the Pre-Qin period in the Dongtiao River Basin in the north of Zhejiang

To date, the vast majority of proto-porcelain kiln sites discovered through archeology have been located in proto-porcelain by some scholars. There are great differences between such ware and the proto-porcelain of the Shang and Zhou dynasties in terms of the clay body, the glaze and the types of vessels. Its inheritance from the proto-porcelain of the Shang and Zhou dynasties remains to be studied further.

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1 The proto-porcelain is mainly celadon. However, in addition to celadon, there is also some black glazed porcelain. Black glazed porcelain is mainly distributed in the mounded tombs in central and western Zhejiang. Due to the lack of unearthed materials, the context of the formation, development and decline of black glazed porcelain is not very clear.

2 During the period between the decline of proto-porcelain in the late Warring States period and the emergence of mature celadon represented by such kiln sites as Shangyu Dayuanping and Xiaoxiantan in the late Eastern Han Dynasty, a kind of celadon ware was popular in Zhejiang. Its glaze was similar to that of the proto-porcelain of the Shang and Zhou dynasties, but there were great changes in the texture of the clay body. It was traditionally called high-temperature glazed pottery, which is called
Zhejiang. The proto-porcelain kiln sites discovered in Zhejiang are distributed in two areas: the Dongtiao River Basin, with Deqing as the center, and the Puyang River Basin, with Xiaoshan as the center, while the former is the main distribution area.

The Dongtiao River is located on the western edge of the Hangjiahu Plain in the north of Zhejiang Province. It originates at the southern foot of Tianmu Mountain in Lin’an District, Hangzhou City. It flows from northwest to southeast into Qingshan Lake in Lin’an District, flows eastward through Liangzhu Town and Pingyao Town in Yuhang District, then flows northward into Deqing County, runs through the central area of Deqing County and enters the urban area of Huzhou City, where it joins the Xitiaoxi River and flows northward into Taihu Lake. To the west of the Dongtiao River are the Tianmu Mountains, while to the east is the Hangjiahu Plain. Deqing County and southern Huzhou City, which the Dongtiao River passes through, represent a hilly area in the transition between the western mountainous area and the eastern plain. With undulating low mountains and crisscrossing rivers and lakes, the area is rich in porcelain clay and fuel, and the water transportation there is convenient, which is very favorable for making porcelain.

Up to now, a total of more than 140 kiln sites of the Pre-Qin period have been discovered, which can be classified into two large groups of kiln sites: the Longshan group of kiln sites in Deqing County and the Qingshan group of kiln sites in Huzhou City, with the former as the main body.

The Longshan group of kiln sites in Deqing County are mainly located at the south and east foot of Longshan Mountain, which is the boundary mountain between Huzhou City and Deqing County. The south foot of Longshan Mountain is mainly located in the former Longshan Township (current Wukang Town in Deqing County), and part of it is located in Luoshe Town, while the east foot of Longshan Mountain is located in Daixi Town,
Huzhou City. So far, a total of more than 120 kiln sites have been discovered in this group; the periods when these kilns were built include the Xia Dynasty, the Shang Dynasty, the Western Zhou Dynasty, the Spring and Autumn period, and the Warring States period. The Qingshan group of kiln sites in Huzhou City is located in the former Qingshan Township (current Donglin Town) in Huzhou City, with a total of more than 20 kiln sites built mainly in the Shang Dynasty. The products of both groups of kiln sites are mainly proto-porcelain, and also include a certain number of pottery products with impressed patterns. The kiln sites excavated in this area so far include Piaoshan kiln site, of the Xia Dynasty; Nanshan kiln site and Nigushan kiln site, of the Shang Dynasty; Huoshaoshan kiln site, developed from the Western Zhou Dynasty to the Spring and Autumn period; and Tingziqiao kiln site, of the Warring States period.

6.2.1. Piaoshan kiln site

Piaoshan kiln site is located at Piaoshan Mountain, Donghong Village, Daixi Town, Huzhou City (Zhejiang Provincial Institute of Cultural Relics and Archaeology, etc. 2015). It is distributed across two locations, about 400 m apart, facing each other across the gully. Area II of Piaoshan kiln site was excavated in 2012 (Fig. 6.2: 1). The distribution area of Piaoshan kiln site is not very large, at about 300 m². The kiln remains and rich stratigraphic accumulation have been cleaned up (Fig. 6.2: 2). The kiln site has abundant accumulation, about 1 m thick at the thickest point, which can be divided into two periods: the early period corresponds to the late Xia Dynasty, and the late period to the Shang Dynasty. A large number of product specimens have been unearthed. One kiln which was discovered and cleaned up had been seriously damaged (Fig. 6.2: 3). The kiln tail did not exist. Part of the firebox was preserved, but the walls on both sides were not well preserved and were almost completely destroyed. The residual length of the kiln is 4.2 m, the width of the uphill end to the west end is 2.9 m, the width of the downhill end to the east is 2.2 m, the direction is 105 degrees, and the slope is 22 degrees. The unearthen product specimens are basically proto-porcelain and stamped hard pottery. The shape of the proto-porcelain is very original, and the clay body is consistent with the hard pottery: The colors of clay bodies are darker, most of them being grayish black, cinerous, purplish red and earthy yellow and not pure. Most of the clay bodies resemble a sandwich biscuit, grayish black inside and earthy yellow outside, or earthy yellow inside and cinerous outside, etc. The texture of the clay bodies is loose, with a large number of pores of different sizes and a high water absorption rate (Fig. 6.2: 4). The clay bodies are harder due to higher firing temperature. Except for some under-fired clay bodies, almost no soft pottery has been discovered. The types of vessels mainly include the bowl, tripod plate, long-necked jar, large jar with a folding rim, Dou vessel, sinker-shaped clay objects, pad and clapper. The glazed part is mostly the upward part of the vessel, such as the inside of the tripod plate and the shoulder and rim of the jar. The thicker glaze layer tends to be concentrated on one side of the vessel, such as the shoulder and neck of the jar or one side of the handle of the Dou vessel. The glazing line is not clear, and the glazing thickness gradually thins from the glazed part to the non-glazed part. The glaze layer of most vessels is very thin. Only in a small area of local glaze is the glaze layer thicker, gradually thinning at the perimeter and showing a very thin spot shape. The glaze was not well distributed in the area with thick glaze, showing a spot of coagulated glaze. The degree of vitrification is high and the glass texture is strong, but the glaze peeling is severe due to poor combination of the glaze with the clay body. The glaze color shows darker black-brown, tan or cyan (Fig. 6.2: 5). For the unglazed part of the vessels, including hard pottery, the surface shows a darker black-brown or tan coat or membrane. There are two kinds of hard pottery: plain hard pottery and stamped hard pottery. These are basically the long-necked jar and the jar with a folding rim, with zigzag decorative patterns. For both the proto-porcelain and the stamped hard pottery, the inner belly of the large small-mouth jar is uneven; there are many pits in it, and the pits in the stamped hard pottery are denser and deeper. The outer belly of the proto-porcelain is bright and clean. Many vessels can be seen with very fine lateral smear marks on the outer belly, and most of the spiral patterns along the rim are regular, though some are also irregular. It can be determined that such vessels were formed by dishing up hand-made clay strips. Small vessels, such as bowls, are bright and clean inside and outside, so they were probably formed by wheeling clay.

Piaoshan kiln site is the earliest proto-porcelain kiln site discovered and excavated so far. It can be dated to the late Xia Dynasty. The porcelain excavated from this kiln site is quite primitive in both clay and glaze. These characteristics are very similar to those of hard ceramics, and it is possible to understand the process by which hard ceramics were transformed into primitive porcelain.

6.2.2. Nanshan kiln site

Nanshan kiln site is located in Nanshan Village, Donglin Town, Huzhou City (Zhejiang Provincial Institute of Cultural Relics and Archaeology, etc. 2015). Thanks to the excavation, the remains of three kilns and two ash pits were exposed, and a large number of proto-porcelain wares were unearthed. The remains of all three kilns represent long-strip sloped dragon kilns (Fig. 6.2: 6). Kiln no. 3 is the best-preserved one, with an inclined length of 7.1 m and a width of 2.2–2.4 m. The kiln is considerably original: The whole kiln body is short; the firebox is long and narrow, while the firing chamber is short. The floor of the firing chamber is uneven, and there is no bottom sand in it. It is from the early stage of the development of the dragon kiln, and it is also the earliest proto-porcelain dragon kiln excavated so far. The specimens of unearthed products are all basically proto-porcelain. The types of vessels represented include the Dou vessel, jar and lid, Gui vessel, Zun vessel, basin, plate, bowl and vase. Most
1. Piaoshan section II (view from SE to NW)
2. Stratum TG1 at Piaoshan section II
3. Dragon kiln at Piaoshan section II
4. Xia Dynasty ceramics from kiln at Piaoshan section II
5. Proto-porcelain from Piaoshan section II
6. Dragon kilns at Nanshan kiln site
7. Proto-porcelain Dou of the early Shang dynasty in Nanshan kiln site
8. Nigushan Kiln Site (view from East to West)
9. Hard pottery from Nigushan kiln Site

Figure 6.2. Kilns and ceramic in the Dongtiao River Basin 1 (Courtesy of Zheng Jianming).
of the vessels would have been intended for use as ritual vessels. The texture of the clay bodies of most vessels is relatively fine and firm. The soil for the clay body was carefully selected, but the clay body contained a certain amount of impurities, the treatment of which needs to be further improved. The traces of artificial glazing are obvious: A small number of vessels are full of glaze inside and outside. The glaze color is green. The glaze layer is well distributed, the clay body is well combined with the glaze, and the glass texture is strong, but the glaze layer of most vessels is very thin, and its color is uneven. The body of the vessels was only partially glazed, and the glazing technology was still at the exploratory stage. In terms of shaping, forming by wheeling clay was combined with manual scraping (Fig. 6.2: 7). Nanshan kiln site was not well preserved, and only the firebox remained. The pot shape is sunken, with a gray sintering surface. The upper half of the firing chamber was entirely absent. Based on the morphological analysis, it would have been a dragon kiln. The accumulation of this kiln site was seriously damaged. The stratum is not thick, and the preserved area is not large. There are a large number of sintered clay agglomerates and a small number of product specimens in the preserved stratum, including plain hard pottery and stamped hard pottery, and no proto-porcelain has been discovered. Therefore, this kiln would have fired the pure pottery instead of proto-porcelain. The types of stamped hard pottery wares represented mainly include various kinds of pots or jars. The clay bodies are mainly reddish brown (Fig. 6.2: 9). The stamped decorative patterns are mostly thick and large rhombic cloudscapes, diamond patterns or broken line patterns (herringbone patterns), but there are also small and shallow fine rhombic cloudscapes. Some of the vessels are plain, with a very thin glaze layer on the surface, and the clay body is close to that of the hard pottery. Based on the decorative patterns and types of the products and other aspects, the era of the kiln site was around the Shang Dynasty.

So far, this is the only hard pottery kiln site of the Shang Dynasty to have been cleaned up in the Dongtiao River Basin in Zhejiang Province. The main observation to note is that some products have an extremely thin glaze layer, which is of great significance for understanding the pottery firing technology in this area and the relationship between the pottery firing technology and the proto-porcelain, and also adds a new type to the porcelain production in the Pre-Qin period.

6.2.4. Huoshaoshan kiln site

Huoshaoshan proto-celadon kiln site is located at both ends of the dam of Juebuling Reservoir, Longshan Village, Wukang Town, Deqing County (Zhejiang Provincial Institute of Cultural Relics and Archaeology, etc. 2008). It is an ancient kiln site for firing proto-celadon dating from the late Western Zhou Dynasty to the late Spring and Autumn period. Thanks to the excavation, three kilns and more than 10 ash pits were exposed (Fig. 6.3: 1). All the kilns discovered were located on the hillside, with a certain slope and length which meet the basic conditions of the dragon kiln. The products of this kiln are extremely abundant, but almost no stamped pottery has been discovered. It is a kiln site purely for firing proto-porcelain. The products mainly include bowls, plates, jars, water vessels, pots and basins, which are used as practical utensils, and they also include You vessel, tripod (Fig. 6.3: 2) and Gui vessel shapes, which are bronzeware-imitated pottery for ritual. From the end of the Western Zhou Dynasty to the early Spring and Autumn period, this kiln was in its heyday. Its products were rich in variety, exquisite in production and decorated with a large number of decorative patterns, and the glaze color was excellent. Bronzeware-imitated pottery for ritual discovered mainly dated to this period, and their bellies are often decorated with elaborate decorative patterns, mainly including: connected cloud patterns, fine disordered cloud patterns, double-hook line “S” shapes, cloudscapes and symmetrical arc patterns. The decorative patterns are large in size, extensive in style and disorderly in arrangement, and often overlap with each other (Fig. 6.3: 3). During this period, although the phenomena of under-firing and glaze peeling were the most severe and the clay body was not well combined with the glaze, the glaze layer was thick, the glaze color was dark, and the glass texture was generally strong.

After the middle Spring and Autumn period, bronzeware-imitated pottery for ritual vessels almost disappeared, the bowls absolutely dominated, and a small number of plates and jars were also produced as practical utensils. Both the number and range of decorative patterns decreased sharply, and basically only two kinds of decorative patterns, the symmetrical arc pattern on the jar and the longitudinal fine water-ripple pattern on some bowls, were retained. The style was fine and orderly, and the overlapped stamping phenomenon was rare. Compared with the early period, the texture of the clay body was more compact, finer and smoother; the glazing technology was obviously improved; the clay body was better combined with the glaze; the frequency of under-firing and glaze peeling decreased sharply; the glaze layer became thinner; the glaze was well distributed; and the glaze color became light and showed a light cyan color. In the late Spring and Autumn period, continuing the trend seen in the middle Spring and Autumn period, the number of vessels was further reduced; there were basically only two kinds of cup-type bowls, the bowl with a lid that fits tightly and the bowl with a sharp round rim, with a cylindrical body and a flat bottom. The production technology of the clay body and the glaze were also further
improved. In terms of firing technology, a large number of nearly conical pottery supports dating to the middle Spring and Autumn period were discovered, and one group consisted of three beads used as spacers. Huoshaoshan kiln site is rich in strata and continued to be used for a long time. Through this excavation, it is possible to establish a more detailed basic chronological sequence from the late Western Zhou Dynasty to the end of the Spring and Autumn period. Moreover, the place of origin has been discovered for similar vessels unearthed from Jiangnan mounded tombs, especially for bronzeware-imitated pottery for ritual including the tripod, You vessel and Gui vessel.

Figure 6.3. Kilns and ceramic in the Dongtiao River Basin 2 (Courtesy of Zheng Jianming).
6.2.5. Tingziqiao kiln site

Tingziqiao kiln site is located in Longsheng Village, Wukang Town, Deqing County. The remains of all seven kilns unearthed were built on the gentle slope of a small hill, with a long strip plane (Zhejiang Provincial Institute of Cultural Relics and Archaeology, etc. 2011). They are dragon kilns with southern characteristics, among which the remains of kiln no. 2 are the best preserved. The kiln floor and firebox are basically intact, with a thorough inclined length of 8.7 m. The kiln appears to be very wide, with a width of 3.32–3.54 m. Generally, it is short and wide, with local features (Fig. 6.3: 4). The kiln wall was not built with brick-shaped adobe, but was made of grass mixed with mud paste, with a residual height of 0.2–0.4 m. The firebox is rectangular. Tons of product specimens and kiln furniture have been unearthed. The products are mainly fired proto-celadon and a small number of fired stamped hard pottery wares. The proto-celadon vessels were formed by wheeling the clay. The shapes of the vessels are standardized. The texture of most of the clay bodies is fine, smooth and compact. There are some products fired at a high temperature, for which the texture is hard, the glaze is even and shiny, the glass light sense is strong, and the quality is superior. These products are comparable to the mature celadon of the Eastern Han Dynasty. In addition to the general bowls, plates, cups, handle-less cups, vases, pots, boxes and other daily utensils, the types of the vessels are mainly a large number of bronzeware-imitated pottery for ritual and musical instruments. The types of ritual vessels represented include the tripod, Dou vessel, basin, three-legged basin, plate, three-legged plate, loop-handled teapot (Fig. 6.3: 5), Tilianghe kettle, the flask with openwork pattern on its body, Zun vessel, Gui vessel, Lei vessel, jar, three-legged pot, Fang vessel and Jian vessel. The types of musical instruments represented include the Yong bell, Chunyu, Goudiao, a three-legged percussion instrument made of clay, a dangling bell and a hanging drum seat, with rich types and diversified forms. These bronzeware-imitated pottery for ritual and musical instruments are standardized and dignified in shape as well as exquisite and meticulous in workmanship. Most of them are large and heavy, appearing solemn and majestic. They can be regarded as the best among the proto-celadon in terms of molding technology, firing technology and product quality.

From the perspective of products, during the Warring States period, Tingziqiao kiln site was a kiln site mainly for firing high-grade bronzeware-imitated proto-celadon ritual vessels and musical instruments for the Yue region. As far as the whole southern region and even the whole country are concerned, it is the first example discovered of a kiln for firing these kinds of proto-celadon. This is an extremely important discovery in the archeology of porcelain kiln sites in China. Thanks to the discovery of Tingziqiao kiln site, the definite place of origin and kiln have finally been found for a large number of similibronze proto-celadon ritual vessels and musical instruments unearthed from the tombs of Yue nobles in the Jiangsu and Zhejiang areas, indicating that the kiln for firing high-grade living and funeral porcelain for the Yue royal family and upper-class nobles during the Warring States period was in the current Deqing County, Zhejiang Province. At the same time, it also indicates that Tingziqiao kiln site was a kiln dedicated to the production of high-grade living and funeral porcelain for the Yue royal family and upper-class nobles, so it may to a large extent be something in the nature of an early official kiln. Among the proto-celadon unearthed from Tingziqiao kiln site, many products appear to have been fired at a high temperature. The texture of the clay body is exquisite and firm, the glaze is even and bright, the glaze color is blue and green, and the clay body is well combined with the glaze. The product quality has reached the level of mature celadon. In particular, among the products of this kiln site, there are a large number of well-fired large vessels with a huge and heavy body. From the molding process to the method of loading and firing and then to the control of firing temperature, there were high requirements for and difficulties associated with firing such large vessels with an extra thick clay body. The successful firing of these large vessels represents the highest level of proto-celadon production in Tingziqiao kiln site, and also reflects the fact that Tingziqiao kiln site had a relatively mature porcelain-making technology. Therefore, the excavation information from Tingziqiao kiln site in Deqing County is of great academic significance for recovering the important position and role of the proto-celadon of the Warring States period in the emergence of mature celadon, and for studying the development history of Chinese porcelain, especially the origin of mature celadon in China.

6.2.6. Changshan kiln site

Changshan kiln site is located in the north of Shizhai Natural Village, Luoshe Town, Deqing County. A total of four kilns in two locations were excavated and cleaned up, and a large number of exquisite specimens were unearthed. The kilns in one of the two locations were well preserved, and represented the superposition of three kilns one on another, numbered Y1–Y3, while the kiln in the other location, numbered Y4, was severely damaged. Among these, Y1 was the best preserved: The square firebox is about 20 cm lower than the floor of firing chamber. The dark gray sintering surface at the bottom of the firebox is obvious. The bottom of the firing chamber is covered with fine yellow sand. Y2 is located to the southeast of Y1, broken by Y1, and Y3 is located to the southeast of Y2, broken by Y2. In the southern section, the superposition relationship of the three kilns is clear. Y4 was basically destroyed, but judging from the preserved sintering soil, it was undoubtedly a kiln. A large number of proto-porcelain specimens were unearthed from the piles on both sides of the kiln, most of which were of high quality: The texture of the clay body is exquisite and firm; the clay body is excellently combined with the glaze; the glaze is well distributed; the glaze color is verdant or cyan; the glass texture is strong; and the clay body and glaze are close to those of the mature celadon of the late
period. In addition to the bowls used as practical utensils, there are also a considerable number of ritual vessels and musical instruments: tripod, pot, jar, Yong bell, Chanyu, and Goudiao, etc. These ritual vessels and musical instruments were discovered in large tombs, such as the Yue Tomb in Hongshan, Wuxi City, and were distinguished articles for nobles’ use only. Changshan kiln site, like Tingziqiao kiln site, originated in the Warring States period. It is of great value for exploring the origin of Chinese porcelain, the evolution of China’s kiln system and even the origin of the official kiln system. After a series of excavations of kiln sites and systematic investigation in this area, the profile of the kiln industry in the Dongtiao River basin is basically clear, and displays the following characteristics.

First, the kilns emerged early and lasted for a long time. The kiln sites emerged in this kiln area in the Xia Dynasty, and continuously developed during the Shang Dynasty, the Western Zhou Dynasty, the Spring and Autumn period and the Warring States period, almost without break. So far, this kiln site group is the earliest, longest-used and most complete Pre-Qin kiln site group known in China.

Second, the kiln sites were concentrated, with a large production scale. According to the materials available, there were nearly 150 kiln sites in this period. Many kiln sites, such as Tingziqiao kiln site, had a large distribution area and thick accumulation layer, and the product output had reached a considerable scale (Fig. 6.3: 7).

Third, there were many kinds of products. In addition to the production of bowls, plates and dishes for daily use, a large number of bronze ware-imitated pottery and musical instruments were fired and produced, which symbolized identity and status and had special significance. They included the You vessel (Fig. 6.3: 8), tripod (Fig. 6.3: 9), Gui vessel, Zun vessel, Dou vessel, kettle, Lei vessel, jar, pot, plate, basin, Jian vessel, three-legged plate, the flask with openwork pattern on its body, loop-handled teapot, Tilianghe kettle, gourd-shaped ladle and earthen bowl, which were used as ritual vessels, and they also included the Yong bell, Goudiao, Chanyu, Zhen and hanging drum seat, which were used as musical instruments. The production of these large ritual vessels and musical instruments has only been discovered in this kiln area so far.

Fourth, the quality of products is high. Many products from this kiln area, especially those from the Warring States period, are large in size, standardized in production, exquisite and firm in the texture of the clay body (Fig. 6.3: 10), verdant and smooth in the glaze color (Fig. 6.3: 11), and have well-distributed glaze and a strong glass texture, which are almost comparable to those of the celadon from the Eastern Han Dynasty.

Fifth, an independent kiln area emerged. Starting from the Shang Dynasty, a special kiln area was formed in the Dongtiao River Basin. At least starting from the late Western Zhou Dynasty, the kiln area was basically specialized in firing proto-porcelain only.

Sixth, the kiln furniture has various shapes, and the loading and firing process was mature. During the Spring and Autumn period, a large number of support beads were used as spacers, which were small in shape and meticulous in manufacture, which could effectively protect the glaze and increase the quantity of loading and firing. During the Warring States period, a variety of support firing tools emerged endlessly: they were shaped like a straight cylinder (Fig. 6.3: 12), trumpet, tray, shallow plate, etc. Different support firing tools were used for firing different vessels, which successfully provided for the loading and firing methods of Yong bell and Goudiao instruments, and the loading and firing technology was quite mature.

Therefore, the kiln area of the Shang and Zhou dynasties in the Dongtiao River Basin, with Deqing as the center, is unique and outshines others in terms of production time, kiln-site scale, product category and product quality. It occupies a very important position in the history of Chinese porcelain. It is the first peak in the history of Chinese porcelain-making, and it is also the source of Chinese porcelain.

6.3. Proto-porcelain kiln sites in the Puyang River Basin on the south bank of the Qiantang River

The Puyang River takes its source at the south foot of Xianhua Mountain, Puijiang County, Jinhua City, central Zhejiang Province. It flows through the Zhuji and Xiaoshan areas, and joins the Qiantang River at the mouth of three rivers in Xiaoshan. It is the largest tributary of the Qiantang River, and it passes through low-mountain hilly areas.

During the Pre-Qin period, the kiln sites in the Puyang River Basin were mainly concentrated in the middle and lower reaches of the Puyang River, with Jinhua Town in the south of Xiaoshan as the center, including the adjacent Shaoxing and Zhuji areas. The kiln sites mainly include Maowanli kiln site, Qianshan kiln site and Anshan kiln site in Xiaoshan District, Fusheng kiln sites in Shaoxing City, and Tuoshanwu kiln site in Zhuji City, among which Maowanli kiln site is the largest. The kiln sites that have been excavated so far in the area include Qianshan kiln site and Anshan kiln site in Xiaoshan District as well as Fusheng kiln sites in Shaoxing City.

6.3.1. Xiaoshan Qianshan kiln site

Qianshan kiln site is located in Shaojiata Village, Jinhua Town, Xiaoshan District, Hangzhou City (Zhejiang Provincial Institute of Cultural Relics and Archaeology, etc. 2005). Thanks to the excavation, two dragon kilns were exposed, and a large number of specimens of proto-celadon and stamped hard pottery were obtained. This is a kiln site for firing proto-porcelain and stamped hard pottery together, active during the Spring and Autumn period and
the Warring States period. Of the two dragon kilns, Y2 was well preserved; part of it was directly built on the raw soil, with kiln-protection soil on both sides. The firebox and the back wall of the kiln tail are basically in good condition. The head of the kiln is at the south and the tail at the north, with a direction of 184 degrees, a slope length of 13 m and a slope of about 15 degrees. The dragon kiln consists of the firebox and the firing chamber. The plane of the firebox is semicircular, and the bottom is slightly inclined from the back to the front. The back wall is 2.3 m wide and 0.6 m high, and it is 1.5 m away from the stokehole. The inner side, back wall and bottom of the firebox were sintered into a cinerous hard surface, and the sintering degree of back wall was higher. The inclined length of the firing chamber is about 11 m, and the width of the kiln bottom is 2.3–2.4 m, with almost the same width at both the rear and the front. The vault of the kiln has collapsed, but the collapsed block at the top of the kiln is basically flat at the bottom of the kiln. The vault was made of clay mixed with straw. On the sintered surface of the top, inside the kiln, there are traces of tied branches and woven bamboo strips. The products mainly include stamped hard pottery and proto-porcelain.

According to the distribution of fragments in the dragon kiln, the front section of the firing chamber may have been used mainly for firing proto-porcelain, while the rear section of the firing chamber may have been used mainly for firing stamped hard pottery when the dragon kiln was firing these two types of products in the same kiln. Whether for proto-porcelain or for stamped hard pottery, the variety is relatively simple, and basically represents small daily utensils. Mainly two types of stamped hard pottery are represented, altars and jars, the mouth rims of which have been scraped by the wheel. The decorative patterns of the stamped hard pottery mainly include the

Figure 6.4. Proto-porcelain kiln and vessels (Courtesy of Zheng Jianming).
checkered pattern, rice-sieve pattern and checkered filling line pattern. The proto-porcelain is another main product of Qianshan kiln site. The types of vessels represented include bowls (Fig. 6.4: 1), cups, dishes, plates and lids. They were all made by wheeling. The shapes are small and basically plain. A small number of curved bellied bowls have water-ripple patterns on the inner belly.

6.3.2. Xiaoshan Anshan kiln site

Anshan kiln site is located in Jinhua Town, Xiaoshan District, Hangzhou City (Shen 2009). Three dragon kilns (Fig. 6.4: 2) from the Spring and Autumn period and the Warring States period were excavated and cleaned up. Y1, built on the southeast slope of Anshan, is composed of the firebox and the floor of the firing chamber, with a total inclined length of 10.5 m. The plane of the firebox is a rounded rectangle with 2.75 m in width and 0.35 m in height. The rear wall is 1.25 m away from the stokehole. The connection between the rear wall of the firebox and the floor of firing chamber projects out in a slight arch. There are kiln-protection buildings on both sides of the firebox. Y2 and Y3 are located on the west slope of Anshan, and their structures are basically the same as those of Y1. There are two types of unearthed products: proto-porcelain and stamped hard pottery. The types of proto-porcelain wares represented include bowls, jars, dishes, plates and handle-less cups (Fig. 6.4: 3). The texture of the clay body is fine and smooth. The glaze is blue or yellow. The stamped hard pottery includes jars (Fig. 6.4: 4) and altars. The decorative patterns of the stamped hard pottery include the large Hui character pattern, checkered pattern, rice-sieve pattern, Mi character pattern, water-ripple pattern, checkered filling line pattern, and Hui character crisscross pattern. The stamped hard pottery was fired at a higher temperature, to a hard texture. The period of producing the stamped hard pottery was from the middle to late Spring and Autumn period to the early Warring States period. The kiln furniture is mainly of the small, round support plate shaped spacer type. According to analysis of the unearthed remains, it is speculated that Y1 started firing and manufacturing the products in the middle to late Warring States period, Y2 started in the early to middle Warring States period, and Y3 started the earliest, in the middle to late Spring and Autumn period.

6.3.3. Fusheng kiln sites

The Fusheng kiln sites are located in Changzhuyuan and Zhujiashan, Fusheng Town, Shaoxing City (Shaoxing County Cultural Relics Management Committee 1979). Among others, after a simple cleaning of the Changzhuyuan kiln site, the remains of a kiln with a length of 3 m and a width of 2.42 m was exposed. The bottom of the kiln was covered with sand. It was a slope-shaped dragon kiln. Only the middle and rear sections of the kiln were preserved. A few fragments of proto-celadon, geometrically stamped hard pottery and flat round support beads were discovered in the kiln, demonstrating that the kiln was for firing stamped hard pottery and proto-celadon together. A large number of examples of proto-porcelain and stamped hard pottery were unearthed in the stratum. The proto-celadon was made of porcelain clay, with a fine and hard texture and a high firing temperature. Most of the products unearthed were gray-white, while some of them were gray. The shapes of the vessels were standardized, with circles of fine spiral patterns on the inner bottom and numerous cutting-line traces on the outer bottom. A thin glaze with a yellowish tint was applied inside and on the outside of the vessels. The glaze layer was not well distributed, with obvious coagulated glaze, and most of the outer bottoms were not glazed. The types of vessels represented include bowls, plates, dishes, pots, lids and other small daily utensils, lacking variety. The geometrically stamped hard pottery includes containers such as jars and altars. The bone of the clay body is dark purple, purple-black or dark gray, and the texture of the clay body is strong. The outer wall of the pottery is stamped with geometric patterns such as rice-sieve pattern, Mi character pattern, checkered pattern, mat pattern and Hui character pattern. The period of production for these vessels was from the middle to late Spring and Autumn period to the early Warring States period.

6.3.4. The main kiln sites in this area, other than the excavated kiln sites described above

In terms of product category, this group of kiln sites mainly produced stamped hard pottery and a small number of proto-porcelain wares; in terms of age, this group of kiln sites started from the middle to late Spring and Autumn period, flourished in the early Warring States period, and declined in the middle Warring States period; and in terms of the types of proto-porcelain, this group of kiln sites basically produced small daily utensils such as bowls and dishes and occasionally produced small jars, but no large proto-porcelain ritual vessels or musical instruments have been discovered. This group of kiln sites must be a supplement to the group of kiln sites of the Pre-Qin period in the Dongtiao River Basin, with Deqing as the center. The largest group of kiln sites in this area is located in Maowanl. Although it has not been formally excavated, the profile and distribution of this group of kiln sites have been basically clarified through several years of investigation: This group of kiln sites covers an area of about 20,000 m². It is composed of several kiln sites in Quijaishan, Shizishan and Wusongtui. It was mainly for firing stamped hard pottery and proto-porcelain together. The proto-porcelain mainly includes bowls, plates, dishes, pots and other daily utensils. No large ritual vessels and musical instruments have been discovered. The quality of the glaze and of the clay bodies of some vessels is high. The stamped hard pottery mostly includes jars and altars. Their decorative patterns are relatively simple, mainly including the checkered pattern, double Hui character and Shi character crisscross patterns, rice-sieve pattern and checkered filling line pattern. These vessels were fired in the dragon kiln. The kiln was relatively mature, and the use of space was reasonable. This area was an important distribution area of early dragon kilns. These kilns started
from the middle to late Spring and Autumn period and lasted into the Warring States period.

6.4. Basic pattern and significance of proto-porcelain kiln sites of the Pre-Qin period in Zhejiang

Among the proto-porcelain kiln sites of the Pre-Qin period in Zhejiang, the group of proto-porcelain kiln sites of the Pre-Qin period in the Dongtiao River Basin, with Deqing as the center, is unique and outshines others in China in terms of production time, kiln-site scale, product category, product quality and firing technology. It occupies a very important position in the history of Chinese porcelain. It was the first peak in the history of Chinese porcelain-making, and laid a solid technical foundation for the emergence of mature celadon in the Han Dynasty. However, the group of proto-porcelain kiln sites of the Pre-Qin period in the Puyang River Basin, with Xiaoshan as the center, is not only small in scale, but also has a relatively simple variety of products. The products of these kilns mainly included small daily utensils such as bowls and plates. The period of activity for these kilns was mainly from the late Spring and Autumn period to the early Warring States period. This group of kiln sites was an important supplement to the group of proto-porcelain kiln sites of the Pre-Qin period in the Dongtiao River Basin. Its emergence was closely related to the conflict between Wu and Yue in the middle and late Spring and Autumn period and the retreat of Yue culture to the south of the Qiantang River (Zheng 2019).

The group of proto-porcelain kiln sites of the Pre-Qin period in the Dongtiao River Basin has important academic value in the following respects.

6.4.1. Providing an important material basis for exploring the origin, development and maturity of porcelain

The proto-porcelain kiln sites discovered in this area can be traced back to the Xia Dynasty or the period between the Xia and Shang dynasties. In terms of the clay bodies, glaze and molding technology of the products and the loading and firing technology of the kilns, these kilns were both mature and original. The products of these kilns had the characteristics of an early form of porcelain. They are the “proto” porcelain. This provides important material information for exploring the origin of porcelain and the development history of China’s porcelain. The discovery of large-scale proto-porcelain kiln sites in the Dongtiao River Basin fully proves that this area is an important origin point for Chinese porcelain. And the continuous development of the proto-porcelain kiln sites during the Western Zhou Dynasty and Eastern Zhou Dynasty formed the first peak in the history of Chinese porcelain-making.

6.4.2. Finding the place of origin for some of the proto-porcelain products unearthed elsewhere

The proto-porcelain wares unearthed in Jiangnan and Northern China, including the Yinxu area and Zhouyuan, are similar to the products from the kiln sites in the Dongtiao River Basin in terms of type, shape, clay body, glaze and other characteristics, and can be preliminarily identified as the products of this basin. Therefore, the investigation and excavation of a series of kiln sites in the Dongtiao River Basin provides very important information for exploring the place of origin for the unearthed proto-porcelain. The discovery of kiln site products of this basin in the capitals of the Shang and Zhou dynasties, such as Yinxu and Zhouyuan, not only proves that the proto-porcelain was a kind of high-grade vessel symbolizing identity and status during the Pre-Qin period, but also further proves that the northern proto-porcelain was probably produced in the south.

6.4.3. Providing a wealth of material information for the establishment of the chronology of proto-porcelain of the Pre-Qin period in the Taihu area

The proto-porcelain kiln sites of the Pre-Qin period in the Dongtiao River Basin lasted for a long time, and the evolution of the vessels was clear. From the Xia and Shang dynasties to the late Warring States period, a complete chronological sequence of the proto-porcelain of the Pre-Qin period in the Taihu area can be basically established. Considering that not many sites in this area have been excavated and dateable materials are not abundant, the age of the site could be disproved, which is conducive to establishing a more detailed chronology of Pre-Qin archeological culture in this region.

6.4.4. Enriching the research on the archeological culture of the Shang and Zhou Dynasties in the Taihu area

It is one of the most important characteristics of Yue tombs that proto-porcelain ritual vessels were buried with the dead instead of bronzes. Therefore, proto-porcelain plays an extremely important role in Yue and Pre-Yue culture. Its significance is similar to that of bronzes in the Central Plains, where the use of bronzes was a symbol of the identity and status of the user. The large-scale production of proto-porcelain during the Pre-Qin period showed that the proto-porcelain production at that time was no longer dependent on the kiln site, but formed an independent kiln area, which is an important basis for exploring the social division of labor at that time. The emergence of a large number of proto-porcelain ritual vessels, musical instruments, tools, weapons and farm implements reflects the unique ritual vessel system in the region. The emergence of the products of this kiln area in Yinxu, Zhouyuan and other capital cities provides an important clue for exploring the contacts between the Central Plains and the Taihu area.

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Abstract: Proto-porcelain, made of kaolin clay and fired at a temperature of 1100–1200°C, was the preferred medium for imitating bronze objects in Southeast China during the Yue Bronze Age (circa third to sixth century BC). This chapter firstly focuses on the characteristics of this special skeuomorphic tradition and explores the value construction of proto-porcelain vessels. Secondly, the process which transformed proto-porcelain into the main component of grave-good assemblages in the Yue region is analyzed. Proto-porcelain consumption seems to have been impacted by both complex socio-political processes on a transregional scale and socio-technical decisions on a local communal level. Moreover, the main component of proto-porcelain seems to have been sourced locally, was used over multiple generations, and can therefore be envisioned as a historical agent through which the inhabitants of Southeast China stressed their local “Yue” origin.

Keywords: Proto-porcelain, Bronze Age China, Yue State, skeuomorphs, ceramic production

7.1. Introduction

Since the Early Bronze Age (ca. 2000 BC), the river valleys of Zhejiang province in Southeast China have been inhabited by people who produced a diverse set of ceramic materials for both daily and ritual use. Far removed from the traditional center of power located in the Central Plain, this early ceramic tradition was remarkable for its highly specialized production of a new type of material, proto-porcelain, in locally developed dragon kilns. In particular, the Dongtiaoxi river valley, in modern Huzhou City, is often considered to be the birthplace of proto-porcelain due to the overwhelming archeological evidence of large-scale kilns producing a variety of proto-porcelain products. Stimulated by the unprecedented growth in ceramic production that took place in the Yue State (ca. 600/500–330 BC), the craft of proto-porcelain was brought to perfection through the practice of skeuomorphism. Proto-porcelain skeuomorphs, mainly imitating bronze objects, became a distinctive craft product and an essential part of mortuary rituals in the Yue State. This being said, the choice to select proto-porcelain as a medium for the production of key burial goods, instead of other “customary” materials representing status and wealth, is still not well understood and is often explained in terms of functionality and material scarcity. In addition, despite growing evidence of local autonomy and regionally coordinated developments, outside stimuli are still seen as the underlying cause guiding the consumption of proto-porcelain. This chapter will investigate this specific instance of material preference and attempts to provide an alternative explanation by considering different factors in tandem. Two main questions will be considered: Why did people in this region consider proto-porcelain to be valuable? And why was proto-porcelain selected as a fundamental component of grave good assemblages? Through the analysis of the process of value construction of proto-porcelain skeuomorphs, and its relationship with the selected prototype and skeuomorphic material, it will be argued that proto-porcelain consumption was largely impacted by complex socio-political processes related to the display of power, status and regional identity on a transregional scale. Furthermore, the value of proto-porcelain skeuomorphs seems also to have been socially constructed on a local level and involved specific technical decisions. Moreover, the people that produced and used proto-porcelain might have envisioned proto-porcelain as a historical agent that stressed their local origin as inhabitants of the Yue land and recalled an emotional bond with the ancestral past, which was evoked by its material source, e.g. kaolin clay, and its consistent use over different generations in the Yue region.

7.2. Setting the scene: proto-porcelain and the Yue State

Proto-porcelain is a ceramic material, made of kaolin clay and fired at a temperature of 1100–1200°C, that started to circulate in various parts of China before and during the Shang Dynasty (1250–1046 BC) (Lu 2015: 354–55). Although its name and place of origins is controversial (Xie 2012: 69–71), proto-porcelain is often seen as occupying an intermediate stage on the evolutionary scale between earthenware and porcelain, and can be categorized as a special type of stoneware. Furthermore, the technical ability to produce proto-porcelain is seen as a