

Research on Proto-porcelain and How It Reflects the Changes in People's Life

Hehan Zhou^{1,a,*}

¹*Shanghai Pinghe School, Shanghai, 201203, China*

a. 2518209121@qq.com

**corresponding author*

Abstract: Proto-porcelain is a transition product between pottery and porcelain. It was born around 1700 BCE and left the stage of history around 400 AD. The southern part of China is one of the main places where proto-porcelain originated. As a functional object, it almost has the same dominance as pottery and bronze wares, being used for daily life or religion. However, it has distinct functions compared to other objects in the same era as well. For instance, as a kind of proto-porcelain, it has many differences with the real china which has higher sintering temperature and more complete glaze. This paper aims to find and clear up the characteristics, development, and era significance of proto-porcelain through literature research. According to analysis, it is found that proto-porcelain reflects the breakthrough of the technique of making porcelain, as well as the change of people's aesthetic trends over the time.

Keywords: Proto-porcelain, Color, Glaze, Temperature, Aesthetic trends

1. Introduction

Proto-porcelain was the name of porcelain in its initial stage of development. It appeared in the late Xia Dynasty, Shang Dynasty, and Western Zhou Dynasty throughout the northern and southern parts of China. Proto-porcelain was rarely seen in the north after the middle of the Western Zhou Dynasty, while mature porcelain was finally developed in the south during the Eastern Han Dynasty [1]. There was not a ready-made name or concept when the proto-porcelain was first unearthed. Only after a long term of practice and research process in the archaeological community and coupled with intense academic discussion, it was gradually separated from "glazed pottery", "glazed ware", and even "pottery" [2].

The notion of proto-porcelain was created by Guo Moruo. In the 1950s, scholars such as Chen Wanli and An Jinhui consciously began to distinguish between "youtao" (glazed pottery) and "qiqi" (porcelain). In 1956, Chen Wanli described a type of semi-porcelain ware in his book *A Brief History of Chinese Celadon*, where the type of semi-porcelain ware featured a thin layer of yellow-green transparent glaze, a strong and durable glaze surface that was not easily peeled off, and a dense body that produced a clear and melodious sound when tapped. He referred to this type of ware as "primitive celadon." In 1960, An Jinhui, in his article *A Discussion on Several Issues of Zhengzhou Shang Dynasty Porcelain*, argued that the glazed artifacts unearthed in Zhengzhou Shangcheng were not pottery but already possessed the characteristics of early porcelain. He further pointed out the basic features of porcelain in a broad sense.

This research endeavors to unravel the intricate journey of Chinese proto-porcelain, a remarkable transitional artifact situated between the realms of pottery and porcelain. Concentrating primarily on the southern region of China, a prominent cradle for pottery production, the author uses a literature review and case study as the research methods to explore the meaning reflected by proto-porcelain from the perspectives of technique breakthrough and people's appreciation over time. In this way, this paper attempts to find how proto-porcelain reflects the change in people's lives in the Bronze Age and Iron Age, thus illuminating the profound significance of proto-porcelain within the wider historical tapestry of artistic and technological progress.

2. Characteristics of Proto-porcelain

2.1. Color and Glaze of Proto-porcelain

The color of proto-porcelain is usually turquoise or cinerous. This has something to do with the component of the porcelain body and the recipe for the glaze. The glaze of proto-porcelain always contains high properties of iron elements which will cause the color of the whole porcelain to become dark-green. Furthermore, the color of the glaze will also alter while sintering in the furnace. The high temperature will finally lead to the color change of the porcelain. The glaze of proto-porcelain will display a type of transparent green-yellow color after being fired at a temperature of around 1200 degrees. The body of this glazed pottery is made of clay and it is fired at a high temperature so that the fetal material is hard and compact, the texture is fine, the molding degree is high, and the water absorption is minimal. Then, people call it the original porcelain or blue glaze ware [3]. Nevertheless, the equipment in the Bronze and Iron Age could not afford the proper and higher temperature for the formation of real china, as a consequence, the glaze of it is easy to fade and fall off after being used by residents for a long time.

2.2. Decorations of Proto-porcelain

The former proto-porcelain seeks concise and simple patterns and decorative things. The most common patterns of the proto-porcelain include straight lines, curved lines, and single dots. These patterns are always made by some techniques like depiction and printing. Moreover, the applique is also a formation of depiction. People paint some scenes or some intriguing figures like animals or humans on some pottery slices and then stick them on the porcelain body. The decorative things on proto-porcelain are more similar to that on bronze wares instead of the subsequent porcelains. Nevertheless, the decorative objects gradually become more diverse and distinct.

2.3. Shape of Proto-porcelain

There are some kinds of basic shapes of proto-porcelain like vases, bowls, plates, teapots, dishes, or cups. These shapes are also similar to those of pottery. These shapes are more functional than decorative because they are almost used for daily life. However, different from pottery, proto-porcelain is more complex and multiple in its shape. Ancient people could make them in the shape of cats, sheep, or cattle because the high temperature of sintering can make the proto-porcelain have a denser density so that they can be made in various shapes.

3. Reasons for the Formation of Proto-porcelain

3.1. The Breakthrough of the Technique

First of all, the creation of a chimney can help remove waste gas products like carbon dioxide or sulfide away from the furnace. This seemingly simple action can provide the uncertain causes of some

waste gas products like the resistance to ignition or sintering. Finally, this will create a more stable condition for the whole porcelain-making process.

Secondly, because of the waste gas and the smoke hovering above the ground, the gas pressure is relatively lower than the outside gas pressure on the top of the chimney. As a consequence, the gas inside can be exhausted outside, while fresh oxygenated air enters the kiln, which will increase the rate of gas exchange. Finally, this whole gas exchange process can maintain the high percentage of oxygen inside the furnace, which can increase the temperature inside the kiln. Primitive porcelain, in addition, requires a higher temperature than pottery because of its different chemical components. According to the paper *Chemical composition analysis of Shang Dynasty printed hard pottery and original porcelain unearthed at Daxinzhuang Site in Shandong Province*, the body color of printed hard pottery is mostly dark brown, while the body color of the original porcelain is mostly gray or bluish gray. In the original porcelain matrix, the content of silica is relatively high, the content of alumina is relatively low, and the total content of flux oxides in the matrix is also relatively low, so the porcelain firing can withstand higher temperatures. However, the two are very similar in the selection of raw materials, as well as panning and refining processes, which not only shows the difference between printed hard pottery and ordinary pottery but also shows that the emergence and development of primitive porcelain have a relationship with printed hard pottery [4]. Huang Yunming said: "Since the distant Neolithic Age, professional kilns have appeared. The discovery of the Maoershan Dragon Kiln reflects important changes in the structure of the kiln during its development, which provided the technical basis for the emergence of the original porcelain and the later firing of mature porcelain [5]."

3.2. The Selection of Specialized Soil

The first and foremost soil used to produce successful and outstanding porcelain is kaolin and china clay. These two types of soil have the characteristics of plasticity and adhesiveness which can hugely increase the strength of the porcelain products. Especially, the high percentage of iron elements in the soil can make the porcelain more durable and withstand higher sintering temperatures, indicating that the use of specialized soil that can stand higher sintering temperatures promotes the formation of proto-porcelain and leaves more choices for the shape of porcelain.

3.3. The Change in People's Life Conditions

With the change of time, many tribes that have conflicts with each other gradually become countries. In ancient China, the Xia Dynasty maintained peace for about 400 years without ruthless wars of annexation or any other extreme hazards. During this period, people had a more stable life, and they seek for more functional and beautiful objects. Compared to pottery, porcelain is more functional because it can be used for a longer time. The glaze-trapped porcelain body attributes a lot. With this layer of glaze, the porcelain is more durable than before. As a result, it is not easy for it to leak water. Moreover, porcelain with various shapes and slippery surfaces satisfies people's aesthetic trends. As a result, humans construct more factories to produce porcelain.

4. People's Aesthetic Change Reflected by Proto-porcelain

4.1. People's Aesthetic Trends Before the Formation of Proto-porcelain

Before the formation of proto-porcelain, the main object used by humans was pottery. During the Xia Dynasty, gray pottery basically inherited the development of pottery in the late Longshan culture. The common pottery cookware mainly includes tripods, pots, and retorts. There are beans, bowls, and three-legged dishes. Pottery containers mainly include urns, pots, and jars. Most of the pottery

surfaces are decorated with basket patterns, check patterns, and rope patterns, while some pottery has polished surfaces patted with recurrent patterns, leaf vein patterns, scroll patterns, cloud thunder patterns, circle patterns, petal patterns, etc. In this period, the most crucial feature of pottery is its simple patterns and simple decorations.



Figure 1: Red pottery from the Shang Dynasty (source from baike.baidu.com).

During the Shang Dynasty, the situation slightly changed. With the improvements in the technique, people have higher productivity. As a result, they become richer and have more time to think about how to make more complex and fantastic pottery. The most famous types of pottery are red pottery (see Fig. 1), white pottery, black pottery, and printed hard pottery. Printed hard pottery of the Shang Dynasty was found in the middle and lower reaches of the Yellow River and the Yangtze River. The hard pottery of the early Shang Dynasty is the hard pottery of the late Erlitou culture. The embossed hard pottery unearthed from the middle and lower reaches of the Yellow River in the Shang Dynasty is commonly in the form of vases. The necks of the embossed hard pottery mostly have string patterns left when the wheel is made, and the bottom of the abdomen is more than the decorative leaf vein patterns, cloud thunder patterns, and herringbone patterns. The pure green is more purple-brown and yellow-brown. In addition to the common ware forms found in the middle and lower reaches of the Yellow River, there are also pots, bowls, cups, and beans. In addition to purple brown and tan, there are more reddish-brown or red. Common patterns are cloud thunder patterns, leaf vein patterns, grid patterns, zigzag patterns, and back patterns. In the middle and lower reaches of the Yellow River in the late Shang Dynasty, the printed hard pottery was made of urns, pots, and statues. In addition to leaf vein patterns and cloud thunder patterns, there are rope patterns. In the middle and lower reaches of the Yangtze River, there are many kinds of stamped hard pottery, such as urns, pots, and kettles. The texture and pattern are the same in the middle stage. The number, variety, and pattern of printed hard pottery in the middle and lower reaches of the Yangtze River are more than those in the middle and lower reaches of the Yellow River, indicating that printed hard pottery was fired and used more in the middle and lower reaches of the Yangtze River since the Shang Dynasty. Through these types of pottery, it is found that their decorations are more diverse and their colors are more vivid and vigorous. However, the main decorations of pottery in this period are more similar to those on some bronze wares. These patterns show a feeling of solemnity without creating any lively feelings. Influenced by the slave society of the Shang and Zhou Dynasties, the low level of productivity directly led to the craftsmen paying more attention to the practical function of pottery, which was mostly regular in shape and durability and simple in patterns [6]. Figures 2-4 are different shapes of proto-porcelain, and they display different decorations.



Figure 2: Special shape of proto-porcelain (source from sohu.com).



Figure 3: Special decorations of proto-porcelain (source from zhongguociwang.com).



Figure 4: Special color of proto-porcelain (source from zhuanlan.zhihu.com).

4.2. People's Aesthetic Trends After the Creation of Proto-porcelain

The proto-porcelain of the Warring States period was fine and dense, and the clay was crushed and washed. The shape is regular and the thickness of the wall is even. Compared with the proto-porcelain in the Western Zhou Dynasty, the blank clay is finer, and the forming method is changed from the mud strip and disk to the wheel-making method, which greatly improves production efficiency and output. A thin layer of lime glaze is applied on the surface of the billet, and after firing, most of the glaze is cyan or yellow. At that time, the proto-porcelain was made into bowls and dishes, tripods, bells, and so on that imitated copper ritual vessels. Through the figures above, it can be seen that proto-porcelain has many patterns and decorative objects, like cattle and cats. People use some daily animals as the model to create the porcelain. Finally, these objects become more vigorous and contain higher appreciation value.

5. Conclusion

This article analyzes the color, materials, and decorations of proto-porcelain. After showing the basic information, the author further illustrates three reasons for its emergence which include the technique breakthrough, the soil selection, and the change in people's life conditions. Finally, the article discusses the change of porcelain from the Xia Dynasty to the Shang Dynasty. During this period, decorations and types of porcelain bodies and patterns all underwent great changes. The porcelain becomes more fantastic and vigorous instead of just being functional.

Although this article only conducts a brief research on how proto-porcelain displays the time change, it can help readers further understand the importance of proto-porcelain as an antique for the whole human beings in the past. Porcelain is an outstanding contribution made by the Chinese nation to world civilization and represents Chinese wisdom, Chinese creativity, and the Chinese way of life.

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