

Research on Xingzhou Kiln based on Longhua National Museum

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Abstract—With aesthetic characteristics and values of historical culture, Xingzhou kiln is the treasure of national third-level museums which is definitely different with other famous kilns. This study is a foundation for promoting the cultural IP as well as cultural and creative product design of county-level museums. This paper applies the methods of literature review, investigation and comparative study. Taking the regional culture of Xingzhou kiln as the background, this paper carried the research from the perspectives of types, vitreous, glaze and decoration of porcelain. And the conclusion is that Xingzhou kiln contains detailed porcelain technology in which centers on glaze color and glaze, mainly white glaze, black glaze is not black, but uneven glaze, glossiness; the fetal quality is rough cylinder tire; ornamentation is mainly painting patterns and writing; the method of loading and firing is various and the shape is a half-inverted flame-type steamed bread kiln. In a word, it has important cultural value which is worthy of studying.

Keywords—*Uplift; National museum; Xingzhou state kiln; Comparative method*

I. INTRODUCTION

Longhua national museum is a national third-level museum which belongs to longhua county, chengde city, hebei province. Xingzhou kiln where vessels, modeling, firing technology has the typical characteristics of the yuan dynasty unearthed porcelain and specimens partly.

The firing implements of Xingzhou kiln are mostly daily articles and a small number of articles but no porcelain pillow. The implements are made by sagger firing, roasting, astringent ring and trunnion ring covering fire. The tire, glaze and decoration of Xingzhou kiln can be divided into three series, imitating cizhou kiln, jun kiln and a small number of imitation construction kiln, gradually formed its own unique style in the process of imitation burning. Xingzhou kiln is a flat horseshoe half-flame steamed bread kiln, which is composed of seven groups: wind tunnel, kiln door, fire chamber, ash chamber, kiln bed, chimney and kiln wall. The kiln in xingzhou used firewood as fuel rather than using coal as the kiln in the south of yanshan in the same period.

II. THE OVERVIEW OF THE XINGZHOU KILN

Since the 1970s, xingzhou kiln was a large-scale kiln in the north. It began to make porcelain in the late jin dynasty and flourished in the yuan dynasty, ending in the early Ming dynasty. Belonging to cizhou kiln system, products of Xingzhou kiln are mainly civil porcelain. Longhua is a relic of

human activities which can date back to 200,000 years ago. Longhua has more than 500 cultural relics and it's nationalities involving shanrong, donghu, wuhuan, xianbei, xi, khitan, nuzhen, Mongolia and manchu.

A. The advantages of geographical location of the kiln

Wang xiaoqiang said in his book longhua xingzhou kiln that the liao dynasty built beianzhou and the wind and dance khitan. Jin yuan xing zhou, bang shan qi medicine, making porcelain near water, Bright light, multicolored... [2] longhua is in the north of hebei province, at the intersection of the ison and imatu rivers. The kiln site is located in the northeast of longhua county. There are lush forests, rich water in intersection where is surrounded by coal production, with the ancient development of ceramic handicraft industry ideal conditions.

Liaojin period was an important stage of the historical development of longhua. Agriculture, porcelain making, iron smelting, charcoal burning, animal husbandry and other industries developed rapidly. Longhua has a unique porcelain conditions and material basis. At the end of the jin dynasty, the Mongol regime entered the local area. With the coming of the craftsmen who were threatened and looted in the war, the local porcelain industry rose abruptly and became one of the main economic production situations.

Xing state kiln is a large-scale folk kilns during jinyuan period of yanshan, was built in accordance with the hing could, has an integral with the era of cultural relations, however, about the xing state porcelain making historical fault, it was not until the 1970 s few records to LongHua local porcelain making remains to conduct archaeological investigation and excavation, the research work, the researchers on the basis of historical and territorial and administrative division now, which is called as "xing" state kiln, or "LongHua kiln".

The main kiln area is in the north of the town of longhua river valley flat bottom, centering with the baojiaying. Longhua basin has convenient waterway and land transportation. The luanhe river which is rich in hydraulic resources is a tributary of the luanhe river recorded in the notes to the water classics of the ison river. Surrounded by dense mountain vegetation, fuel resources. The favorable geographical position and profound cultural environment have created the unprecedented prosperity of the kiln site of baojiayin.

At present, however, the longhua kiln has been destroyed, the kiln site has been completely opened up for vegetable land.

Porcelain kilns had long been dug up and filled up, except for some ash residue, kiln tools and porcelain pieces piled up on the ridge of the farmland, with the stacking area of about tens of thousands of square meters. Other kiln can not be found, but still can be seen at that time there are quite a lot of workshop group.

B. The cultural background of Xingzhou kiln

In the yuan dynasty, the grassland nationality established the political power, and its bold and unconstrained national character influenced the secular life. The design of xingzhou kilns was also affected. Many "wine" commodities written on xingzhou kilns were a direct response to the social demand, and the abundance of such porcelain products showed that the local wine was prevailing at that time.

Xingzhou kiln was a large-scale porcelain making field in the jin and yuan dynasties, and some of its products were ordered by the government. It has formed its own unique style in the process of imitating and firing the products of cizhou kiln, jun kiln and building kiln.

III. THE OVERVIEW OF XINGZHOU KILN ARTISTIC IMAGE

A. Types of porcelain in Xingzhou kiln

There are many kinds of porcelain including bowl, dish, cover bowl, implement cover, bowl, water pan, basin, cup, urn, furnace, can, basin, bottle, pot, chicken leg altar, porcelain toy (nail cap, animal porcelain model, go son)etc.

TABLE I COMPREHENSIVE ANALYSIS OF XINGZHOU KILN PORCELAIN IN LONGHUA NATIONAL MUSEUM

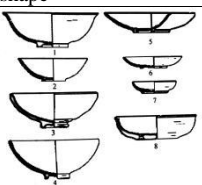
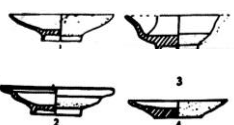
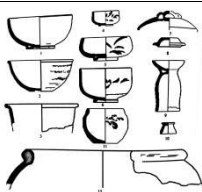
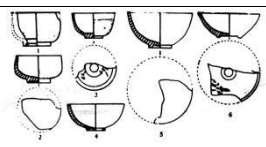

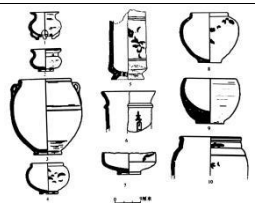
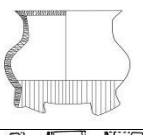
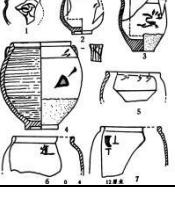
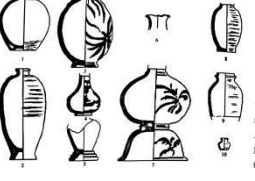
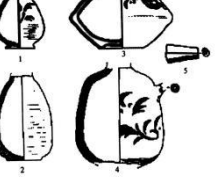
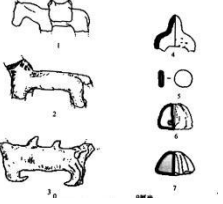
species	shape		Characteristics analysis
bowl		Big, medium and small three	Carpal feet wide, awn mouth, pointed lips, open and closed mouth, inclined wall, lower abdominal arc, bottom center slightly concave, circle foot small, foot center with milky convex; Liaojin period, yuan dynasty porcelain Character times characteristic, material characteristic, implement type characteristic
plate		Shallow abdomen dish, straight mouth dish	Acute lip, oblique straight abdomen, ring foot, inner band astringent ring, awning mouth; The yuan dynasty porcelain
tureen		Covered bowl with waist, closed mouth, straight wall	Acute lip, straight wall, microgirdle waist, lower abdomen arched, circumferential foot; The folding of the mouth; The yuan dynasty porcelain
lid		The shape of side down, the shape of helmet	Straight down, on the arc, flat top, top plastic twist, shaped like a tail; Wide arc edge, inside arc top, outside flat top; The yuan dynasty porcelain
bowl		A smaller straight bowl	Square lip, straight mouth, outer arc inward, large flat bottom; The yuan dynasty porcelain
Water jar		The folding of the mouth	Lips thin along apical, abdominal wall shallow and concave; The porcelain of yuan dynasty
Best cup,		Tall tube foot cup, yuan dynasty foot cup	Lower tubular foot, upper calyx, round lip, arched abdomen; Mouth tip lip, foot is bell shaped; The yuan dynasty porcelain

Table I, cont

Cylinder (weng)		Big mouth jar, small mouth jar	Large mouth, small mouth, lip, external abdominal arc, external abdominal drum, small flat bottom; The yuan dynasty porcelain
The furnace		Three foot furnace, ring foot furnace	Crotch calli shape, wide flat edge and wide wide edge, pointed lips, square lips, bunched neck, low bulging belly, circle feet, small flat bottom, three animal legs shaped feet; The yuan dynasty porcelain
tank		The difference between a straight mouth and a straight mouth	Straight mouth, circle foot bulging abdomen, tube shape, straight wall, circle foot curved abdomen, wide mouth convergence mouth, high collar; The yuan dynasty porcelain
The basin		Circle foot basin, foot basin	Square lips, round lips, straight mouth, lip mouth, lower abdomen arc close, lower abdomen oblique close, circle foot, lie foot, roll along curved abdomen basin, cylindrical basin; The yuan dynasty porcelain
bottle		Plum bottle, circle foot four-series bottle, jade pot spring bottle, tower bottle, flower mouth bottle, arched abdomen bottle, garlic mouth bottle, shoulder bottle	Big mouth, pointed lips, round lips, thin neck, short neck, upper abdominal arc, lower abdomen oblique straight, lying on the feet, the body is slightly fat; Shoulders plump, smooth, flat; The yuan dynasty porcelain
pot		Circle gallbladder type pot, large flat - bottomed pot, bent pot, pot	Round lips, corset neck, shoulder, hanging abdomen, lower abdomen, round foot, medial oblique cutting; Fine and thin, fine and fine at the mouth; Box shaped, domed; The yuan dynasty porcelain
China plastic toys		Animals, gourds, go pieces, spikes	Animals such as horses, dogs, camels, gourd only top, go black and white, nail cap with steamed bread shape and conical; The yuan dynasty porcelain

In a word, there are 16 categories of ware in longhua kiln. The shape of a variety of porcelain are characterized with the mouth, pointed lips and round lips, convergent mouth and straight mouth, such as ring foot characteristics. Ware, molding, firing technology for the typical characteristics of the yuan dynasty. Porcelain for daily use, a small number of furnishings. The bottom of the round ware is protruding outward to form the umbilical base, among which the bowl type accounts for more than 70% [2], with 11 styles. Most of them are different in bowl body and bowl shape.

B. Xingzhou kiln fetal Tire Color

The official kiln in the Southern Song Dynasty is famous for its crackled celadon. The color of most famous glaze is pink and blue, others are turquoise, turquoise, gray, white and yellow. Compared with the Southern Song Dynasty kiln, Xingzhou kiln has no green color series, and more red brown, white bias yellow, gray black, white yellow and some relatively deep colors will give people a sense of tranquility and comfort.

Longhua ceramic workshop is used in the production of waste soil produced locally, that is, the North China clay. The carcass is divided into red brown, white partial yellow, and

black black [2]. According to fetal quality, fetal colors can be divided into five categories.

White porcelain body, slightly yellowish, have white quartz sand grains and small black sand spots, but less and fine, thin body, stable shape, glazed smooth, is the best of the longhua kiln porcelain. Gray tire, slightly brown, fine texture, no porosity and fracture phenomenon, jun porcelain body mostly belong to this kind. There is also a dark gray, livid color, hard but rough, quartz and fine sand.

Brown coarse porcelain, similar to firebrick structure, hard, glazed bright, with uneven size of brown eyes, in the large number of the longhua kiln.

Cylinder porcelain body, the tire body thick, particles are very thick, light brown, the body has white dots, hard thick. Ceramic body, belongs to glazed pottery works, the body is not sintered, burned at low temperature, the body is thick and loose, white and yellow color.

C. The glaze quality and color of Xingzhou kiln

Glaze color is one of the main parts of ceramics. In song dynasty, kiln in ru city was different from xingzhou kiln. Song huizong once ordered the firing of ru kiln celadon with "green as the sky and jade as the face" under the name of "awning can't be used". The porcelain of longquan kiln is mainly of blue glaze color, which was successfully fired in the heyday of longquan kiln (late southern song dynasty). The blue glaze of longquan kiln is closer to the vast blue sky and calm lake [2].

Xingzhou kiln is mainly made of white glaze, which is bright and smooth. It is different from the elegant style of ru kiln and longquan kiln. Longhua kiln porcelain has white glaze, black glaze, green glaze, sauce glaze, jun glaze, tea glaze, green glaze (that is, lead glaze). It is divided into 7 categories according to glaze color [3].

White glaze is one of the main varieties produced in the longhua kiln, because glaze is sensitive to formula, color and roasting in kiln, white color changes greatly during producing. White glaze is mainly divided into four types: silver glaze, white ivory slightly yellowish, yellow white glaze yellow composition, gray white glaze layer is thinner, bright but glaze is not smooth.

The quantity of green glaze and celadon is very few. Green glaze is mainly divided into four types. The first tire color is white, the color is lighter, only along the mouth and product glaze place color is darker, thick and smooth glaze layer, glaze uneven. The second kind of gray - blue glaze, glaze gray hair is actually white glaze on the dark gray body, glaze blue hair. The third glaze layer and glaze color are uneven. Longhua kiln celadon, glaze color is not uniform, quality is not high, at that time the craftsman configuration blue glaze technology is not mature.

Black glaze in the general ceramic workshop, black porcelain with coarse raw materials. The black porcelain in longhua kiln can be divided into four types. The first kind of black glaze is very delicate whose glaze color is even and glossiness is not high, but glaze is even. The second kind of black glaze slightly brown, thin glaze layer, glaze layer with brown eyes. The third is a bright, heavy glaze applied on a

coarse brown matrix. The fourth color is black, the glaze has silver-gray luster, the glaze is applied on the thick body, similar to the surface of the drumstick altar.

Jun glaze quantity is less and it thus just can be divided into two kinds. The first kind is light gray, glaze for black - brown. The second kind is lighter, the glaze layer is more dignified, and the glaze surface is bright.

Color of glaze of tea end resembles tea broken end to gather together, glaze not brightness, style elegance. It is prepared for the burning of black enamel.

Glaze, glaze like tahini sauce brown, thin body, light color, thick body on the glaze.

The method of green glaze is dip in the glaze, and the glaze surface is uneven. There is a phenomenon of glaze accumulation on the inner wall, and uneven glaze layer on the outer wall.

Although the rough body of longhua kiln porcelain reduces the artistic effect of beautiful porcelain, most of the porcelain in the kiln is bright and smooth, and the civil coarse porcelain has a certain design aesthetic feeling. The variety of wares in the kiln was not rich, and the categories of glaze color were few. However, certain design methods were used in the color collocation of porcelain to make the color collocation no longer monotonous. According to the economic conditions at that time, the beauty of porcelain was the highlight of longhua kiln.

D. Xingzhou kiln firing method

The peculiarity of xingzhou kiln lies in the extensive use of calcining technology in the yuan dynasty. At that time, the calcining method was no longer used in the north. Calcining process is an advanced process created by ding kiln in the northern song dynasty to increase the output, which was used in some areas of the jin, southern song and yuan dynasties [2]. We can judge from these data that the production age of longhua kiln was from the jin dynasty to the yuan dynasty.

(1) Stack the bowl wares one by one with the support of the sagger and put them into the sagger and fired in the kiln.

(2) Bowl and basin products shall be supported by supporting columns.

(3) For small-mouth products, there is a one-week astringent ring on the shoulder. The bottle foot is put on the shoulder of another bottle, and one set is put on the kiln casing for roasting.

(4) Branch ring calcining, learn the process of ding kiln calcining, buckle the bowl products on the branch ring, the branch ring layer by layer, this method is widely used in xingzhou kiln for taking up a little space.

The burning method of Xing kiln, early kiln column, triangular spacer frame burning method; funnel-shaped enamel burning method; disc-shaped, enamel-like, funnel-shaped combined burning method; barrel-shaped burning method; In the Jin and Yuan Dynasties, the support circle was also used for overheating, the sand ring was stacked, and the bead was burned. The white earth kiln has a similar craft porcelain, which was covered by the overheating process during the Jinyuan period. Jizhou kiln is mainly produced in the late Tang

Dynasty and the Five Dynasties to the Yuan Dynasty. Compared with other burning methods of Xing Kiln, Xingzhou kiln uses a large number of over-burning processes with low cost, high output, fuel saving, and solves the problem of low output in the porcelain industry.

IV. XINGZHOU KILN PORCELAIN DECORATION ANALYSIS

Porcelain products are mainly cultural entertainment for daily use, with a certain number of recreational articles, such as children's toys, musical instruments, go, chess, etc. Decoration for two glazes, under glaze black painted flowers, under glaze inscription, Inscriptions on the glaze, a la carte, stir glaze, oil droplets, etc. Porcelain decoration is the same with cizhou kiln the style, pattern theme to flowers, animals in the majority. More often, we see the decoration on porcelain is simple painting. Flowers, birds, fish and worms, bamboo branches and water plants are their conscious artistic discovery of life, or the original nature of painting language. The image, abstraction, simplicity and randomness are the emotional expression of craftsmen. Craftsmen look up to all things, and all familiar objects can be painted [2].

The underglaze is painted with flowers or inscriptions and transparent glazes, and the chords are drawn on the underside of the glaze. The chords are commonly found in bowls, plates, pots and other shorts along the bottom or inner part, or in the outer wall of tanks, bottles, etc. The shoulders, lower abdomen, black painted chords are one week or several axes, and the lines are even and smooth.

A. Two glazes

The glaze is only found in the bowl, the pelvic floor and the inner wall. The sauce glaze flows naturally in the transparent glaze. It is accompanied by the layers, the layers are distinct, the color is bright, the clouds are flowing, the rhyme is spontaneous, and it is very dynamic and confusing. Beige glaze ink book text porcelain jar can be applied to the sauce glaze, external beige glaze. The glazed bowl is a typical glazed glaze decoration method porcelain.

B. Glaze inscription

The inscriptions are mostly cursive, sub- or sly, smooth lines, random strokes, free and unrestrained, lively and free. The variety is diverse, mostly for the people to enjoy, exhortation, good wishes, word games and so on. Wide range of content, including poetry, kiln people, digital models, year number room name, Ji Yan praises more than 60 kinds.

Compared with the glazed inscriptions of Changsha Kiln, the texts are mostly made by calligraphy or engraving. The expressions are separate or combined with calligraphy and painting. The inscriptions include poetry, proverbs, proverbs, inscriptions and inscriptions [2]. Longhua kiln is only decorated with calligraphy, and its expression is more diverse.

C. Underglaze black painted flowers

The black painted flowers outline the heavens and the earth, the middle part of the painting, the thick ink like paint, the mother has flowers, birds, fish, insects, see the peony, the big branches of flowers, and the single chrysanthemum. Rolling branches of peony, plum, bluegrass, bamboo branches, grass stems, butterfly love flowers, etc., the pen is naturally

continuous, full of ink, vivid and vivid, full of local flavor, refreshing, full of vitality.

Xingzhou kiln bottles, pots and other small mouthparts, such as four-series bottles, jade pot spring bottles, bile pots and other outer walls, mostly with sauce, brown color intermittently painted, spliced into landscapes, flowers, trees, geometric patterns and other patterns, Painted inward, down-dark rendering, rich in layers of change. Simple and bright brushstrokes, fresh and natural artistic conception, very infectious. The picture is shaded and appropriate, far and near, revealing the meaning of traditional Chinese ink painting, giving people a feeling of gloom and leisure.

D. Decoration on the tire body

Refers to the dazzling pattern drawn at the moment of turning of the porcelain when the porcelain is formed, or the shallow and wide wavy pattern is formed by pressing the sidewall with a smooth tool. Longhua Kiln is not clear in such lines. In order to increase the beauty, a layer of white and delicate makeup soil is applied to the surface of some carcass. The make-up soil makes the glaze layer lubricious and bright, improving the quality of porcelain. A piece of stirrer goblet collected in the Longhua County Museum is made of ash-brown mud with a texture of the annual ring and a light cyan transparent glaze.

E. White glaze and black color

Flowers and poems painted on the porcelain are the main decoration of the fine porcelain of longhua kiln. The main patterns of the white glaze black flower are string pattern, circle pattern and ray pattern. One of them is a piece of white porcelain in longhua museum. The abdomen is painted with tall and strong leaves with luxuriant leaves. Because the bamboo is from the south, it is rare in the works of white glaze and black flowers in cizhou kiln in the north. In the works of black color in longhua kiln, the words "gentlemen love money and take youdao" were written in black color on the abdomen of vessels such as large POTS, which was very eye-catching. The bamboo, peony and twig flowers painted in the white glaze and black flower porcelain belong to the jin dynasty in texture and artistic style.

The unearthed porcelain specimens, vessel type, modeling and firing technology are typical characteristics of the yuan dynasty. The typical wares of xingzhou kiln are the four series of brown and colored landscape bottles and the large VAT with black painted inscriptions.

V. ANALYSIS OF XINGZHOU KILN CULTURAL INNOVATION FEASIBILITY

During the liao, jin and yuan dynasties, Longhua formed a large-scale ceramic production area in the north when the northern minority regime was in control. Porcelain is widely used in people's life, and folk magnetic kilns are widely rising. In terms of technological style, longhua kiln belongs to cizhou kiln system [2], but it is affected by the advanced technology of ding kiln in terms of technology. Longhua kiln was influenced by longquan kiln in Beijing, chifeng kiln in Inner Mongolia autonomous region, datong kiln in Shanxi Province and hunyuan kiln in jin and yuan dynasties. Bearing the supply of

northern hebei region folk living with porcelain needs, Longhua kiln was also an important production area of China's ceramics during the jin and yuan dynasties. The discovery of longhua kiln is of great scientific value.

Xingzhou kiln utensils are fired by single-burning, set-burning, smashing, sand stacking, and support ring burning. The local characteristics are obvious. The tires, glazes and decorations are divided into two series, which are like the magnetic kiln and the kiln. The carcass is divided into reddish brown, whiteish yellowish, grayish black.

The color of glaze include yellowish, grayish, and greenish white, or is divided into sauce glaze, black glaze, enamel glaze, and tea glaze. It is decorated with two pieces of glaze, underglaze black painted flowers, underglaze inscriptions, spotting, glazing, oil drops, blue and white, etc. The two glaze bowls are covered with white glaze or black glaze, and the cans are opposite. White glaze is painted under the glaze inscription. The theme is flowers and birds. Fish, insects, peony, chrysanthemum, orchid, grass, geese, dragonflies, figures, etc. are smooth and vivid. The inscriptions are idioms in the form of grass or lines, kiln people, number of words, year number, room name, Jiyan praise, etc. There are 50 kinds of different words, and the writing is free and unrestrained. The spot color is more common in small mouthparts such as bottles and pots, such as four-series bottles, jade pot bottles, and bile pots. It reveals the meaning of traditional Chinese ink painting, giving people a feeling of faintness and leisure.

The type of Xingzhou kiln porcelain has strong practicability, showing a low-key style, such as plum bottle round neck and neck, upper abdomen curved shape, lower abdomen recycling, contour line is soft and straight, center of gravity is upward, plum bottle features distinctive, It has practicality and aesthetics, which highlights the beauty of historical and cultural heritage. Most of the porcelain in the Xingzhou kiln is a bowl, and the shape of the bowl is closed in the lower abdomen, and the circle is small, and the distinction between the opening and the mouth is. The carcass is thick and the center of gravity is below. People use it for drinking and eating. It is not easy to turn over when used. It is easy to pick up, and it is practical and functional.

VI. CONCLUSION

The xingzhou kiln in longhua national museum is the most concentrated collection and research of xingzhou kiln products in China. In the process of imitating cizhou kiln, jun kiln and building kiln products, it formed its own style. As the cultural IP of the museum, the glaze color, detailed process and shape of xingzhou kiln are half inverted flame type steamed bread kilns. The vessel shape, decoration and craft all have certain modernity as well as important value, which can be used for derivative design.

In recent years, a large number of unique porcelain from liao, jin and yuan dynasties have been discovered in longhua county and its circumjacent areas. However, whether they are products of xingzhou kiln remains to be further discovered and the characteristics of fired porcelain still need to be further clarified.

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