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Discussion on the Status and Influence of Shangyu Kiln Industry in Ancient Ceramic History

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Abstract: Shangyu is recognized as the cradle of Chinese celadon, positioning China as the birthplace of global celadon. The significance of the Shangyu kiln industry in the context of ancient ceramic history is unequivocal. This article systematically elucidates the status of the Shangyu kiln industry in Chinese ceramic history and its multidimensional influence on the world, drawing upon archaeological data from various domestic and international kiln sites, as well as urban archaeological discoveries related to Shangyu celadon.

Keywords: Shangyu celadon; Ceramic history; Korean Peninsula; Japan

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1. Introduction

The Chinese ceramic history has undergone a developmental trajectory from pottery, stamped hard pottery, proto-celadon, to mature celadon. Although artifacts of proto-celadon have been excavated from burial sites within Shangyu, such as the proto-porcelain ritual vessels from the two Zhou Dynasties found at a burial mound in Fenghuang Mountain [1] and the proto-porcelain Fang vessel with two beast-headed ears [2] unearthed from the Western Han Dynasty at a construction site in Baiguan Town. There is insufficient evidence to assert that these products were locally manufactured. The western bank of Hangzhou Bay, in proximity to Shangyu, is recognized as a core production area for proto-porcelain. From the Shang and Zhou Dynasties through the Qin and Han Dynasties, the proto-porcelain kiln industry exhibited a trend of continuous eastward expansion across the Ningshao Plain, extending from the East Tiaoxi River basin in Huzhou to the Xiaoshan Mountain evolutionary region. During this period, Shangyu emerged as a significant marketplace adjacent to the production sites of proto-porcelain. With the passage of time and the synergistic effects of consumption incentives, the eastward migration of kiln artisans, and the development of ceramics resources

in Shangyu, mature celadon ultimately materialized in this region during the Eastern Han Dynasty.

2. Status quo of Shangyu kiln industry in the context of Chinese ceramic history

The kiln industry in Shangyu is predominantly located in the valleys on both the eastern and western banks of the Cao'e River, which boasts favorable natural conditions conducive to the development of the ceramics manufacturing industry. The region is abundant in porcelain clay resources, providing an ample supply of raw materials necessary for ceramics manufacturing; densely forested areas supply sufficient fuel for the ceramics production; and an intricate water network facilitates both water sourcing and transportation, allowing the movement of ceramics via tributaries into the main course of the Cao'e River. From this point, ceramics can be transported northwards to Hangzhou Bay, connected westward to the Qiantang River for distribution across Jiangnan (the regions south of the Yangtze River), and exported eastward to markets in the Korean Peninsula, Japan, and beyond.

Archaeological investigations over the years have identified a cluster of eight principal kiln sites in Shangyu: the Fenghuang Mountain kiln site group (the Han and Six Dynasties), the Sifeng Mountain kiln site group (Eastern Han), the Dahu'ao kiln site group (Eastern Han), the Linghu kiln site group (the Eastern Han to the Tang and Song Dynasties), the Yaosiqian kiln site group (the Eastern Han to Tang and Song Dynasties), the Aohua Mountain kiln site group (Eastern Han), the Zaoli Lake kiln site group (the Han and Six Dynasties), and the Hengtang kiln site group (Six Dynasties), collectively comprising over four hundred kiln site points [3]. The chronology of the kiln industry extends roughly one thousand years, from the Eastern Han through the Northern Song Dynasties, featuring periods of both flourishing activity and decline. By analyzing the quantity of kiln sites, the scale of production, and the quality of output across various epochs, we can categorize the Shangyu kiln industry into four distinct phases, thus elucidating its status in Chinese ceramic history.

2.1. Eastern Han to Western Jin Dynasties

This period marked the initial zenith in the emergence and evolution of Shangyu's ceramics manufacturing industry. Concurrently, it signified the first pinnacle in the development of Chinese ceramics. Statistical data reveal that there were 45 Eastern Han Dynasty kiln sites in Shangyu. This number reached 42 during the Three Kingdoms Period and peaked at 53 during the Western Jin Dynasty. The kiln sites in Shangyu alone accounted for 67% of the total in the Jiangnan region [4]. In stark contrast are the kiln sites in the middle reaches of the Yangtze River. Taking the Hongzhou Kiln in Jiangxi as an example, according to the current records, only 31 kilns from the late Eastern Han Dynasty to the Tang Dynasty and the Five Dynasties were discovered in total. Among them, there are fewer than 10 kiln sites dating from the Eastern Han to the Western Jin Dynasties [5].

Beyond the quantity of kiln sites and the scale of kilns, the diversity and quality of ceramics are crucial indicators of the ceramic industry's development. During the Eastern Han Dynasty, celadon vessels exhibited relatively limited variety. They had yet to fully extricate themselves from the influence of pottery and proto-porcelain. High-necked multi-loop jars and five-tube bottles were prevalent. The vessel bodies were frequently impressed with linen-like patterns. The adhesion between the porcelain body and the glaze was tenuous, rendering the glaze layer susceptible to

exfoliation.

From the Three Kingdoms Period to the Western Jin Dynasty, the number of porcelain vessel forms expanded markedly. Utility items permeated every facet of daily life. Tableware such as bowls, plates, basins, cups, zun, pots, bottles, and jars became commonplace. Stationery items like inkstones and water pots, along with "huzi" (a chamber pot in the shape of a tiger), were also in use. Burial objects were remarkably abundant. During this period, there were celadon counterparts of the ceramic figurines of people and animals, as well as ceramic buildings and other items that were used as funerary objects in the Han Dynasty. The decoration and connotations of vessel forms evolved significantly. The Eastern Han five-tube bottle gradually transformed into a granary jar adorned with elaborate pavilions and towers. With the popularity of Buddhism, Buddhist imagery became a favored decorative motif on celadon. During this period, the adhesion between the porcelain body and glaze was robust, preventing exfoliation. The reducing atmosphere within the kilns was highly effective, endowing the celadon with a vivid and jade-like green hue. In contrast, celadon products from the Hongzhou Kiln in Jiangxi and the Yuezhou Kiln in Hunan, both in the middle reaches of the Yangtze River, were generally of inferior quality. Their glazed surfaces were marred with numerous cracks and severe exfoliation, and the glaze exhibited a yellowish tinge, placing them far behind Shangyu celadon.

2.2. Eastern Jin to Southern Dynasties

Beginning from the Eastern Han to the Western Jin Dynasties, the ceramics manufacturing industry in the Jiangnan region underwent progressive outward expansion. This expansion catalyzed the emergence of ceramic industries in the middle and upper reaches of the Yangtze River, northern Fujian, and northern China. During the Eastern Jin and Southern Dynasties, a seismic shift occurred in the national ceramic industry landscape. Firstly, the Yue Kiln system, centered around the Shangyu Kiln, experienced a decline. The number of kiln sites in Shangyu plummeted from 53 during the Western Jin Dynasty to 4 during the Eastern Jin Dynasty and 6 during the Southern Dynasties. Product quality deteriorated precipitously. Not only did the variety of vessel forms diminish, but craftsmanship became coarser. Intricate piled-up decorations featuring animals, pavilions, and towers either disappeared or were simplified. In their stead, green glaze with brown-spotted patterns gained popularity.

As the Yue Kiln declined, the Hongzhou Kiln and Yuezhou Kiln entered a zenith of development, emerging as new centers of the kiln industry. Their products penetrated the lower reaches of the Yangtze River and the northern regions. Relevant artifacts have been unearthed from the tomb of Li Yuanmao in Zanhuang County, Hebei, and the Jingling Mausoleum of Emperor Xuanwu of the Northern Wei Dynasty in Luoyang, Henan [6]. Outside these centers, local kilns such as the Huairen Kiln in northern Fujian and those in Sichuan and Guangdong were extensively marketed within their respective regions. Based on their strategic border-region locations, they exported products to the Korean Peninsula and Southeast Asian countries via land and sea routes.

2.3. Sui-Tang Dynasties through the Five Dynasties and early Song Dynasty

Despite its decline during the Southern Dynasties, not all Shangyu kilns vanished. It entered a phase of slow development during the Sui-Tang Dynasties. Tang Dynasty Shangyu celadon was predominantly distributed along both banks of the middle reaches of the Cao'e River, specifically at sites like Lianjiang Linghu and Shangpu Jiazhang, with

expansion towards Longpu. Surveys indicate that the number of kiln sites, which stood at less than 10 during the Southern Dynasties, swelled to over 40 during the Sui-Tang Dynasties [7]. This was accompanied by marked improvements in celadon quality, characterized by enhanced adhesion between the porcelain body and glaze and reduced impurities. The vessel forms diversified significantly. The burgeoning tea-culture led to the emergence of tea-ware assemblages, including ewers, tea cups with saucers, waste bowls, and side-handled pots. The decorations of the artifacts exhibit two major trends: imitating gold and silver wares, and imitating natural flowers.

During the Five Dynasties and early Song Dynasty, the Shangyu kilns underwent exponential growth, marking the second zenith since the inception of celadon in the Eastern Han Dynasty. The Yaosiqian Kiln site serves as an exemplar of this period. In the "Guangjiao Temple" entry of the *Wanli Annals*, quoted by the *Shangyu County Annals* compiled during the Guangxu period of the Qing Dynasty, it is recorded that: "Guangjiao Temple is located thirty li southwest of the county seat. In the past, thirty-six imperial kilns were established here, and there are the former sites of the official courtyards." The imperial kilns mentioned in the document refer to the Yaosiqian Kiln site. As Shangyu celadon entered the imperial courts of the Wuyue Kingdom and the Northern Song Dynasty, it attained the zenith of its kiln industry historically. The products transitioned from the sub-optimal state of the early-to-mid-Tang Dynasty—characterized by uneven glaze surfaces and abundant clay spots within vessels—to the ice-and-jade-like secret-color porcelain. This porcelain type was fired in porcelain clay saggars, sealed with glaze to create an intense reducing atmosphere, resulting in a vivid and green hue for ceramics. In the early Northern Song Dynasty, the general adoption of single-firing techniques with one vessel per saggar eliminated support-firing flaws within vessels. Decorative techniques emulated the intricate fine-line-incising technique found in gold and silver wares as far as possible, exuding opulence.

2.4. Mid-to-late Northern Song Dynasty

Following its zenith, the industry experienced a decline. The growing popularity of Jingdezhen Kiln bluish white ceramics and Henan celadon precipitated the decline of the Yue Kiln in the mid-Northern Song Dynasty. The industry began to relocate to the mountainous regions of southern and southwestern Zhejiang. Consequently, the Shangyu Yaosiqian site and the Cixi Shanglin Lake site, two major kiln centers from the Five Dynasties to the early Song Dynasty, declined.

During the mid-to-late Northern Song Dynasty, Shangyu celadon production bifurcated into two distinct product lines. One remained within the Yue Kiln system but exhibited marked coarsening compared to the meticulous craftsmanship of the early Northern Song Dynasty. The fine-line-incising technique, emulating gold and silver wares, was simplified, and incised lines became perfunctory. Glaze surfaces exhibited impurities and were yellowish. The other one belonged to the Longquan Kiln system. Longquan-style celadon emerged in Longquan following the southward migration of the Yue Kiln in the mid-Northern Song Dynasty, with incised and carved patterns on both the interior and exterior surfaces of vessels [8]. In the late Northern Song Dynasty, celadon wares with double-sided incised and carved patterns, centered around the Longquan Kiln, spread out in all directions. Kiln sites influenced by it included the Shabu Kiln in Huangyan, Taizhou, the Songxi Kiln in Fujian, and the Yaosiqian Kiln in Shangyu was also one of them. The difference lies in that kiln sites such as those in Huangyan and Songxi took this type of product as an

opportunity to develop into large-scale kiln site groups for export. In contrast, the celadon production in Shangyu was only sporadic, and eventually, it completely withdrew from the historical stage.

3. Influence of the Shangyu kiln industry on world ceramic history

3.1. Export of Shangyu celadon

The export of ceramics was inextricably linked to the production activities of the kiln industry. The export of Shangyu celadon peaked during two distinct periods: the Six Dynasties and the Five Dynasties to the early Song Dynasty. During the Six Dynasties, celadon exports were characterized by limited scale and strong political undertones. The primary export destination was the Korean Peninsula, with scattered finds in Indonesia and Japan. Western Jin Dynasty Shangyu celadon has been unearthed across multiple regions of the Korean Peninsula, primarily in the three capitals of the Baekje Kingdom along its southwestern coast, i.e. present-day Seoul, Gongju, and Buyeo in the Republic of Korea. These finds were predominantly from royal palaces and noble tombs, with the ceramics consisting mainly of daily-use wares such as bowls, plates, pots, and jars, becoming status symbols among the elite [9]. Functioning as political and diplomatic presents, celadon artifacts were predominantly transmitted by envoys shuttling between the two regions. As a result, the distribution of celadon centered on the capitals of the two countries. The comprehensive distribution route was as follows: celadon items were transported from the Shangyu kiln sites to Nanjing, the capital of the Six Dynasties, via the canal network. Subsequently, they were shipped eastward across the sea to the Korean Peninsula along the Yangtze River.

From the Five Dynasties to the early Song Dynasty, the distribution paradigm underwent a shift. Propelled by the flourishing commodity economy and the development of maritime navigation, large-scale exports of celadon from eastern Zhejiang ensued. The market expanded far beyond the Korean Peninsula, reaching regions encircling the Indian Ocean, including Japan, Southeast Asia, West Asia, the Middle East, and North Africa. Two sunken vessels were unearthed in the waters of Southeast Asia: the Intan shipwreck from the Five Dynasties and the Cirebon shipwreck from the early Northern Song Dynasty. Each shipwreck yielded hundreds of thousands of Yue Kiln celadon pieces. These celadon items were predominantly decorated using the fine-line-incising technique. In addition to the prevalent vessel forms in the domestic market, there were also vessels custom-made for Muslim and Western people. Under the sway of the commercial model, the external distribution route pivoted from a capital-centric model to a port-centric one. During this period, Shangyu celadon could be directly transported to Ningbo Port via the Eastern Zhejiang Canal and then exported overseas. Ningbo in the Northern Song Dynasty rapidly emerged as the preeminent port for the export of Yue Kiln celadon. Countless celadon artifacts were excavated from the ruins of Ningbo Port.

3.2. Imitation of celadon in the Korean Peninsula and Japan

During the apogee of celadon production in China's Six Dynasties, most regions globally remained in the pottery era, lacking the technological prowess to manufacture ceramics. The Korean Peninsula, maintaining close ties with China, was under the jurisdiction of four distinct polities: Baekje, Silla, Goguryeo, and Gaya. At this juncture, the aristocracy predominantly utilized pottery, glazed pottery, and metal vessels for daily use. Once Chinese celadon entered the

Peninsula, its robust texture, glossy glaze, and diverse morphology instantly rendered it a luxury on par with gold and silver. The Tomb of King Muryeong of Baekje Period in the Republic of Korea serves as a prime example. Among the burial objects, in addition to an abundance of gold and silver wares, various celadon jars, bottles, and cups were placed around the coffin. This arrangement vividly attests to the tomb occupant's appreciation for celadon. The predilections of the upper-echelon society propelled the Baekje kiln industry to initiate the imitation of Six Dynasties celadon. The two advanced products of the Baekje kiln industry were hard pottery and glazed pottery. The former was fired at elevated temperatures. In some instances, ash deposits within the kiln created a natural glaze on the pottery surface. However, it did not progress to the proto-porcelain stage. Glazed pottery, featuring low-temperature glazes, was analogous to the Chinese tri-color glazed ceramics and did not naturally evolve into ceramics. Thus, Baekje primarily emulated celadon in terms of vessel forms. Notable examples of imitation include male and female urinals—huzi and dustpan-shaped vessels. In addition to utility vessels, burial objects were also subject to imitation. The celadon figurine-adorned jars, popular from the Three Kingdoms Period to the Western Jin Dynasty, were prime objects of imitation. The Korean Peninsula's imitations were strikingly accurate, particularly in the nearly identical designs of human figures. This influence persisted well into the Unified Silla Period, contemporaneous with the Tang Dynasty in China.

Japan's hard pottery technique was introduced from the Korean Peninsula during the 5th century and was known as "Sueki." Around the Heian Period in the 9th century, spurred by the consumption of Chinese Yue Kiln celadon, the Sanage Kiln pioneered the production of ash-glazed pottery. This marked the advent of Japan's indigenous high-temperature glazing technique. Despite its name, the ash-glaze contained a substantial iron content. Except for its relatively poor quality, it shared remarkable similarities with celadon. Japanese aristocrats held a deep admiration for the Tang Dynasty's aesthetics. The growing popularity of tea drinking in the late Tang Dynasty further incentivized the Japanese kiln industry to mimic Yue Kiln celadon. Building upon Nara tri-color glazed ceramics, they developed monochromatic low-temperature green-glazed pottery to replicate the green glaze and forms of Yue Kiln celadon. The Ishizukuri Kiln in Kyoto stands as a prime exemplar. Archaeological excavations have unearthed a substantial number of open-mouthed, obliquely straight-walled bowls with jade-disc-shaped bases and lotus-leaf-shaped bowls with curled rims. A large quantity of similar vessels has also been unearthed at Shangyu kiln sites dating from the late Tang Dynasty to the Five Dynasties.

3.3. Genesis of Goryeo celadon

Following nearly seven centuries of unavailing endeavors in ceramics manufacturing, the Korean Peninsula successfully pioneered Goryeo celadon during the Five Dynasties to the early Song Dynasty. This was achieved through the direct influx of celadon-manufacturing techniques from the Yue Kiln system. The transfer of such techniques represented a pivotal milestone in world ceramic history, marking the entry of a second nation outside China into the ceramic era. Two key historical contingencies precipitated the genesis of Goryeo celadon. First, the armed conflicts spanning the Five Dynasties to the early Song Dynasty instigated population displacement. During this period, a cohort of kiln artisans from eastern Zhejiang migrated to the Korean Peninsula, driven by the need for refuge or economic sustenance. Second, the Goryeo's persistent official aspiration for celadon impelled them to methodically enlist Chinese migrants, facilitating local ceramics production.

These postulations find substantial corroboration in ceramic archaeological investigations on the Korean Peninsula. Decades of archaeological excavations have demonstrated that early Goryeo celadon not only emulated the morphological characteristics of Yue Kiln celadon but also directly perpetuated its kiln-building and firing techniques. The traditional kiln in the Korean Peninsula was a pit-style dragon kiln, in which ceramics were fired in an open-flame environment. Around the 10th century, brick-constructed dragon kilns, mirroring those of the Yue Kiln, emerged. Ceramics were fired within M-shaped saggars. However, over time, this advanced technology was gradually lost. By the 12th century, Goryeo celadon production reverted to the use of pit-style dragon kilns.

Furthermore, contrary to earlier scholarly conjectures, the early Goryeo kiln sites were not concentrated in Jeollanam-do, despite its geographical proximity to the Zhejiang coast. Instead, they were predominantly located in the vicinity of Kaesong, the Goryeo capital, and in Gyeonggi Province. This distribution pattern underscores the primacy of political resources over natural or economic factors in the development of the ceramic industry. Social transformations, occurring from the top to down, generally mirrored the pragmatic requirements of the upper-echelon society. On one hand, there was an insatiable appetite for luxury goods. The National Museum of Korea houses an array of burial objects unearthed from Kaesong tombs during the Japanese colonial period. Among these, a significant number of exquisitely crafted Yue Kiln ceramics from the Yaosiqian site in Shangyu and the Shanglin Lake kiln site in Cixi, Zhejiang, dating from the Five Dynasties to the early Song Dynasty, were recovered. The Five Dynasties pieces were predominantly plain-surfaced, with some adorned with petal-motif decorations. The early Song Dynasty pieces were decorated with fine-line incising technique, attaining a quality on par with secret-color porcelain. On the other hand, there was an effort to assimilate Chinese ritualistic culture. The Ewha Womans University Museum in the Republic of Korea preserves a celadon ritual vessel inscribed with the dedication: “Crafted by the first chamber of the Imperial Ancestral Temple in the fourth year of the Chunhua era (993 AD, Guisi year); crafted by artisan Choi Gil-hoe.” This artifact represents one of the earliest dated Goryeo celadon pieces, attesting to the high-status official nature of Goryeo celadon from its very inception.

4. Conclusion

Shangyu stands as the cradle of Chinese ceramics as well as the birthplace of global ceramics. It attained maturity during the Eastern Han Dynasty, underwent development throughout the Six Dynasties, reached its zenith in the Tang and Song Dynasties, and subsequently declined into oblivion. During this trajectory, it experienced a nadir during the Eastern Jin and Southern Dynasties, and two apices during the Western Jin Dynasty and the Five Dynasties to the early Song Dynasty. The continuous operation of Shangyu’s kilns over more than a thousand years laid the cornerstone for Chinese ceramic history and exerted far-reaching influence on global ceramic civilization. The global impact of Shangyu celadon can be stratified into three distinct dimensions. First, there was product exportation. In the initial phase, spanning from the Eastern Han Dynasty to the Six Dynasties, celadon was primarily rewarded through diplomatic channels. Post the late Tang Dynasty, celadon emerged in large-scale maritime trade, entering the global markets. Second, there was an influence on ceramics. China was the vanguard in transitioning from the pottery era to the ceramic era. For countries or regions lacking ceramics manufacturing expertise, imported ceramics assumed the status of a luxury item. Official authorities endeavored to replicate these artifacts to satisfy the demands of the elite.

As a result, the forms and decorative styles of Chinese ceramics set enduring aesthetic standards. Third, there was an industrial impact. Imitative products often merely approximated the appearance of Chinese ceramics, lacking the crucial technological know-how to convert pottery into ceramics. The first wave of Chinese ceramics manufacturing technique transfer occurred on the Korean Peninsula in the 10th century. The emergence and development of Goryeo celadon served as a catalyst for local social change.

Disclosure statement

The authors declare no conflict of interest.

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