

White Wares of Northern China

An Historical Overview of the 5th to 8th Centuries

by Neumann Anderson

A remarkable achievement occurred in northern China in the 6th century. In less than 150 years, northern potters transitioned away from their 5,000 year old tradition of low fired pottery and created a new high fired white glazed ware. The beauty and functionality of this novel ware would exert its influence throughout the world.

In this essay I discuss the dynamic interplay of factors in Northern China in the 5th to 6th centuries that culminated in the creation of the world's first high fired white ceramics. In particular, I review two current theories detailing the influence of southern celadon wares on the northern potters in the 6th century. Also discussed are the changes that these ceramics brought about in the material culture of the Sui and Tang dynasties.

In the introduction to his J.J. Lally White Ware exhibition catalogue, collector Ronald Longsdorf escapes the blasé attitude induced by our contemporary mass-reproduced white ceramics; breaking free from the orbit that our privileged modern view affords/costs us, he places himself in the mindset of a Tang Dynasty cosmopolite, musing:

I think innovations, however revolutionary, always look more obvious in retrospect. Today we see white ware in every home furnishings shop, restaurant and home. It is ubiquitous and so it fails to impress. But imagine what it would have been like to see a piece of white porcelain for the first time in the Tang or Five Dynasties periods. It would have seemed nothing short of miraculous. How could this possibly have been made? It couldn't be further from the crude earth from which it was produced.¹

For me, as a passionate collector and amateur researcher, this quote hints towards one of the most fascinating aspects of Chinese antique ceramics, the contrapuntal interplay of cultures and histories, of mundane daily life and grand human achievements. Part of this interplay is the

¹ Ronald W. Longsdorf, *Early Chinese White Wares in the Ronald W. Longsdorf Collection* (J.J Lally & Co. Oriental Art 2015): 2.

intersection of languages and ideas that sometimes, unfortunately, are at cross purposes. This is clearly seen in the mishmash of terms used to describe ceramics.

Ceramics Terminology

Chinese literature typically divides ceramics into two straightforward categories: *ci-qi* 瓷器 (high fired) and *tao qi* 陶器 (low fired). Western literature typically divides ceramics into three categories: earthenware, stoneware, and porcelain. Ambiguity was injected when the term porcelain (which can imply firing temperature, clay composition, and/or color) was grafted onto the Chinese binary division. As the term “porcelain” has no equivalent in the Chinese language, it came to have two dissimilar usages: kaolinic, translucent, high fired white ceramics (e.g. classic Jingdezhen blue and whites), or, *any* high-fired ceramics. The resulting ‘lost-in-translation’ aspect can lead to statements such as “Celadon was the first porcelain made in South China.”² True in one sense, meaningless in another. Moreover, since the foreign word porcelain arose long after the initial development of white wares, it is wholly unsuited to describing the many gradations seen in these early pieces.

The western term “celadon” suffers a similar malady. The original Chinese term *qingci* 青瓷 refers to a much wider range of ceramics than the French term celadon. The Chinese character *qing* 青 is typically translated into English as green, blue, or blue-green, yet *qing* covers a spectrum ranging from yellow-green to blue-grey. When these wares were imported into Europe, the western vocabulary lacked words to represent these new, abstract colors. The closest equivalent was the grey-green cloak worn by the character “Celadon” in the popular 17th century French play *l’Astree* by Honore d’Urfé. Unfortunately, the shepherd’s monochrome covering came to represent a wide ranging group of ceramics, resulting in muddy waters ever since.³ The use of these terms becomes particularly relevant in our context because the distinction between

² Ruofei Zong, “Tracing the Origin of Early White Porcelain in the late sixth century- evidence from Xing kiln” *Archaeometry*, vol. 65, (2023): 515.

³ For a recent discussion on definitions of celadon see: Wenjing Li, et.al: “The definition and origin of celadon—A re-discussion on the name of proto-celadon” *Journal of Archaeological Science: Reports* Vol. 46, 2022.

baici 白瓷 (white glazed high-fired ware) and *qingci* 青瓷 in the early developmental stages of white wares is already blurry at best.⁴

Therefore, in this essay I forgo the ambiguous terms porcelain and celadon. I will use the terms *taoqi* (low fired), *ciqi* (high fired), *qingci*, and *baici*, reserving the English term “white porcelain” to exclusively denote ceramics of the typical western concept of porcelain (e.g. white, translucent, sonorous, using high fired kaolin rich clay). The generic term “white ware” will be used to cover both *baici* and white porcelain inclusively.

Since many influences combined to make the creation of white ware possible, an initial panoramic survey may be useful. The time period covered in this essay will primarily be from the Northern/Southern Dynasties (304-581 AD) to the Tang Dynasty (618-906 AD). The Northern/Southern dynasties period saw immense demographic, political, cultural, economic, and philosophic changes. Between the Northern/Southern Dynasties and the Tang Dynasty, two main centers of ceramic production arose: *qingci* production in southern China and *baici* production in northern China- a division typically condensed into the phrase “Southern Green /Northern White.” The earlier commercial success of *qingci* was a spur to rebuilding the abeyant northern kiln. It is believed that while trying to re-create *qingci*, *baici* wares emerged through collective efforts of kilns across the northern plains. After the reunification of China during the Sui dynasty (581-618) the mastering of techniques to make *baici* and white porcelain led to mass production and exportation of some of the finest ceramics the world had seen up to that point in time. Because current evidence points to northern white ware being derived from southern *qingci* it is helpful to take a brief detour and begin with southern China.

Southern China during the Northern/Southern Dynasties Period

Economic and political stability are as much requirements of ceramic production as clay availability and firing technology. This is clearly seen in the late third century during the Western Jin Dynasty (265-316AD) when the dynamic interplay of these factors began to form the environment in which *baici* and white porcelain would be produced in later centuries.⁵

⁴ Zong, *Tracing the origin of Chinese early white porcelain in the late sixth century—evidence from Xing kiln*, 516.

⁵ Although a very sophisticated white pottery was produced during the Shang Dynasty (1600-1046 BC), it was unglazed white *taoqi*. The production was short lived and seems to have made little impact.

Infighting within the Western Jin royal family began in 291 and lasted for 16 years, destabilizing the government enough to allow the northern Xiongnu tribe to invade and raze the Western Jin capital at Luoyang in 311 AD. The influx of foreign invaders initiated a mass exodus from the north towards the south. Some scholars estimate that from 280 to 329 AD, northern China experienced a population decline of up to 50%.⁶

In 317 AD the exiled Western Jin court settled in the south near modern day Nanjing, forming the comparatively stable Eastern Jin dynasty (317-420); the North devolved into a fragmented battleground for foreign warlords. This division marks the beginning of the complex Northern and Southern Dynasties period. So significant was this disunion that sinologist Mark Lewis argues that “the single most important development in the four centuries between the Han and Tang dynasties was the geographic redefinition of China.”⁷ This division into a Northern China and a Southern China demarcated distinct economic, political, agricultural/dietary, and cultural differences that created separate, unique, and often warring regions.

A cultural change simultaneously developed within elite society, particularly in the wealthy landowning families of the south. Political turmoil dissuaded elites from the court focused life that had prevailed in the Han dynasty to one focused less on obvious material wealth and more on cultural activities and lifestyle.⁸ As famed sinologist Jacques Gernet states: “It would be legitimate to say that a sort of ‘aestheticism’ was dominant throughout the Chinese Middle Ages.”⁹

Undoubtedly this new aestheticism would both stimulate and be reflected in the ceramics. The semi-stable political conditions in south China produced a fertile environment for kilns to

⁶ Victor Cunrui Xiong, in *Cambridge History of China vol. 2 The Six Dynasties* ed. Dien, Albert; Knapp, Keith. (Cambridge University Press Cambridge 2019): 324.

⁷ Mark Lewis *China Between Empires- The Northern and Southern Dynasties*. (The Belknap Press of Harvard University Press.2009): 2. -Fang Lili takes a different view cautioning that this division is simply one of many aspects of that time and that throughout this period “cultural and ethnic integration never ceased” particularly given the focus on Confucianism that occurred in the elite of the North. Lili Fang, *The History of Chinese Ceramics*. trans. Lin, Ma. (Springer Singapore 2023): 180.

⁸ Lewis *China Between Empires- The Northern and Southern Dynasties*, 3.

⁹ Jacques Gernet, *History of Chinese Civilization*. trans. J.R. Foster, (Press Syndicate of the University of Cambridge. Cambridge 1982): 206.

develop their products and created a large market for their use. This was first seen in the growth of *qingci* production in the south.

Increased Production of *Qingci* Ware in Southern China

The stability and increased affluence of southern China fostered a tremendous increase in the number of kilns, including large kiln complexes in the eastern regions of Zhejiang, Fujian, and Jiangsu and a southward expansion into Jiangxi, Hubei, Hunan, and Sichuan.¹⁰ The main production center for *qingci* was the famed Yue kiln complex in Zhejiang province, the largest and most successful of the southern kilns. To get a feel for the scope of these fourth century kiln complexes, consider that the *smaller* Ou kiln in southern Zhejiang alone had over 200 kiln sites.¹¹

The quality and diversity of the wares markedly improved. During the Eastern Jin Dynasty (317-420) advances in clay preparation, glaze quality, firing techniques, the invention of saggars, and the use of slip, resulted in the production of consistently high quality *qingci*. These *qingci* household wares, with their jade like qualities, became so popular during this time that production of funerary objects declined sharply.¹² Even with that decline, the commercial scope was still enormous. “Incomplete statistics show that since the founding of New China more than 1,000 tombs from the Six Dynasties [317-589] have been excavated and the number of celadon items unearthed is in the tens of thousands.”¹³ The number of household wares produced must have been staggering.

The question arises: Given that the southern kilns were more advanced, productive, and had a more stable environment, why did white ware not originate in the south? One answer is the geological difference between northern and southern China.

¹⁰ Mino, Yutaka and Tsiang, Katherine R. *Ice and Green Clouds Traditions of Chinese Celadon*. (Indiana University Press Bloomington 1986): 185.

¹¹ Fang, *The History of Chinese Ceramics*, 190.

¹² *Chinese Ceramics from the Paleolithic Period through the Qing Dynasty*: ed. Zhiyan, Li; Bower, Virginia; Li, He (Yale University Press, New Haven 2010): 187.

¹³ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 215.

Kaolin (an aluminum silicate) is a key mineral component of white clay bodies, slip, and glaze. Though it exists in the north and the south it is in quite different forms. Southern kaolinite is typically found in rock form (“China stone”) and requires more processing in order to create white clay bodies.¹⁴ But because the southern clay naturally contains higher levels of quartz and feldspar, southern potters could produce classic *ciqi* at lower firing temperatures (1,200°C - 1,300°C). The southern clay material is therefore ideal for producing *qingci*, but yields a greyish clay body upon firing and so is not ideal for the production of *baici* and white porcelain. In north China, kaolin is contained in the clay material itself (“China clay”) which- though often containing color impurities like iron oxide and titanium- is easier to prepare to achieve a white clay body. A serious obstacle to *baici* development was that the pure form of kaolinitic clay must be fired to 1,400°C to fully vitrify, a temperature not achievable by northern kilns of that time.¹⁵ This and other obstacles needed to be overcome before the inherent benefits of the northern clay could be utilized to produce high quality *baici* and white porcelain. The ‘when’ and ‘how’ of this remarkable achievement however, remain veiled. We now turn our focus to Northern China during the same period.

Northern China during the Northern/Southern Dynasties Period

As the southern economy and culture began to flourish, northern China became divided into warring mini-territories (the “Sixteen Kingdoms”) each ruled by foreigners from the nomadic tribes of the “Five Barbarians.”¹⁶ These groups were ethnically and culturally diverse from each other and from the Han Chinese who they were now ruling. Recurrent warfare between these groups would persist for nearly 140 years until northern China was finally reunited in 439 AD by the third Emperor of the Northern Wei. It would eventually descend back to disunity in 534 AD.

¹⁴ Nigel Wood, *Chinese Glazes Their Origins, Chemistry and Recreation*. (University of Pennsylvania Press, Philadelphia 1999): 28---See also Shan Huang, *The Origin of White Porcelain Transformation of Ceramic Technology in Sixth Century North China*. (UCL Institute of Archaeology PHD Series Volume 8. Bar Publishing Oxford 2022): 19-20.

¹⁵ Yanyi Guo, “Raw Materials for Making Porcelain and the Characteristics of Porcelain Wares in North and South China in Ancient Times”. *Archaeometry* vol.29 (1): 4.

¹⁶ The Xiongnu, Xianbei, Jie, Di, and Qiang

Due to the frequent warfare, the northern kilns during the Sixteen Kingdoms (304-439 AD) are thought to have been essentially dormant. Few ceramic wares have been uncovered in tombs of this period and their poor quality is demonstrated by the rough *tao qi* figurines uncovered from the Shaolingyuan tomb in Xian, Shaanxi tomb site dated to the Sixteen Kingdoms period.¹⁷

The reunification of the north in 439 AD and the longevity of the Northern Wei dynasty (lasting 148 years) returned a much needed political stability and stimulated the northern economy. Starting in 398AD, a half a million people, including many artisans and potters, were relocated to Pingcheng (modern Datong in Northern Shaanxi).¹⁸ The boosting of the new capital's population and economy resulted in wealth and lavish lifestyles of the new elite. "As one Confucian moralist said, while even the slaves of the rich wore silks in Pingcheng, the farmers down in the Sanggan valley were hungry and half-naked."¹⁹ Thus it is no surprise that the elegant and jade like *qingci*, now in full production in the south, would be tremendously appealing to these new Northern elites.

Re-creation of Southern *Qingci* in Northern Kilns

For over five thousand years the northern kilns had solely produced *taoqi*. *Ciqi* production was exclusive to the south, necessitating the northern elites, who were actively seeking to incorporate traditional Chinese culture, to import southern *qingci* pieces. This is reflected by the southern origin of excavated tomb pieces of early Northern Wei aristocrats.

Part of the appeal of southern *qingci* was their elegant glazing and high fired clay bodies- a stark contrast to northern *taoqi*. The *qingci* glaze could withstand the high firing temperatures needed to produce a well vitrified, solid bodied ware. They were evenly glazed, less permeable to water, easy to clean, and had a jade like appearance. However, the production process required strict control of the oxygen levels in the kiln and "fuel charcoal must be continuously fed into the kiln while maintaining good ventilation, which was very uneconomical. Thus firing celadon was

¹⁷ See Photo 8- https://www.chinadaily.com.cn/a/202104/13/WS60750e4aa31024ad0bab52c9_8.html

¹⁸ Lewis, *China Between Empires- The Northern and Southern Dynasties*, 114.

¹⁹ Pierce, *Cambridge History of China vol. 2 The Six Dynasties* ed. Dien, Knapp, 175.

both difficult and costly.”²⁰ Undoubtedly it would have been even more costly and difficult to transport any sizable amounts of these wares from Zhejiang province to the Northern Wei capital Pingcheng (Datong) on the border of Inner Mongolia. The motivation for northern kilns to produce a native *qingci* must have been strong.

Yet to recreate *qingci*, numerous technical problems needed to be resolved. Southern *qingci* used high fired lime ash glazes fired in wood fueled “dragon kilns”- long tubular kiln structures built on a sloping hill that allowed for very high kiln temperatures and the simultaneous firing of thousands of pieces. Northern *taoqi* used lead-based glazes and were fired in lower temperature, coal burning “Mantou” kilns- small bun-like kilns. Significant technical challenges were posed in the transition from lead glazed *taoqi* to lime ash glazed *ciqi* on which the southern *qingci* were based.

Pieces from two northern kiln complexes reveal the different routes potters took in attempting to resolve these issues. Scholars suggest the potters at the Caocun kiln in Hebei worked to replicate southern *qingci* using lead glazed *taoqi*. Though they were able to recreate visually similar pieces, many resulting wares lacked hardness due to the low firing temperature.²¹ In contrast, the Zhaili kiln complex in Zibo, Shandong is thought to be one of the earliest kilns to overcome these technical challenges and produce some of the first northern *qingci*.²² Analysis of these pieces shows that this re-creation was far from a simple duplication of their southern counterparts. Innovation was necessary and much of the experimentation revolved around the growing awareness of the unique properties of northern clay. It is “(f)rom products of the Zhaili kilns we can see the difference between northern and southern celadon in terms of body material and glaze.... Northern celadon, however, was made from clay with relatively lower iron content and higher aluminum content. The resultant body color was lighter, creating conditions for the production of white porcelain.”²³

²⁰ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 254.

²¹ Yan Lingtong, et.al. “Characterization of early Chinese Northern Celadon with Lead Glaze from Caocun Kiln within Yecheng Site” *Journal of Archaeological Science: Reports* Vol. 19 (2018): 649.

²² Shan Huang, et.al. “The Introduction of Celadon Production in North China: Technological Characteristics and Diversity of the Earliest Wares” *Journal of Archaeological Science*, Volume 114, 2020: 14.

²³ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 196.

The Origin of White Ware in the North

A complete picture of the origins of *baici* and white porcelain is still missing. Most scholars agree that white ware originated at some point in the sixth century; yet in northern China alone this century includes: the end of the Northern Wei, the Eastern and Western Wei, the Northern Zhou/ Northern Qi, *and* the beginning of the Sui Dynasty.²⁴ The tumult of that period makes tracing what actually occurred quite difficult. Most current theories stem from the idea originally proposed by Chinese ceramics expert Chen Wanli in 1956 and bolstered by Feng Xianming in 1958- namely white ware was a byproduct of the northern kilns attempts at replicating southern *qingci*. It is telling that the majority northern kilns working to recreate *qingci* were situated along the lower part of the Taihan mountain range, a land rich in kaolin- the key component of white porcelain.²⁵

Three main methodological approaches are used to try to trace this development: archeological excavation (kilns, dated tombs, and city sites), typology of uncovered ceramics, and scientific/chemical analysis. Unfortunately, the results garnered from these methods are currently at odds with each other and will require both further study and an element of luck- since much of the evidence still lies buried.

Here I summarize two current views on the origin of white wares. They differ primarily in the time period of origin and in the methods the northern potters utilized to develop white wares.²⁶

I. Northern Wei Origin Theory

The first theory is based on the archaeometric analysis of samples taken from the archeological dig of the Bahei kiln in the Gongyi kiln complex near Luoyang City, Hebei. From this analysis,

²⁴ In southern China the fifth century includes; the end of the Qi dynasty, the Liang, the Chen dynasties and the beginnings of the Sui dynasty. Hence the earlier use of “semi-stable” to describe southern China’s political situation.

²⁵ Currently, this stretch still contains some of the most productive kaolin mines. See Huang, *The Introduction of Celadon Production in North China: Technological Characteristics and Diversity of the Earliest Wares*, 11 See also Nigel Wood, “New Discoveries in Chinese Ceramics” (*International Ceramics Fairs and Seminars Catalogue* 1997): 37.

²⁶ Huang, *The Origin of White Porcelain Transformation of ceramic technology in sixth century north China*, pp. 3,13-14, 17.

Li et. al. proposes that white ware was first developed alongside *qingci* in the Gongyi kiln complex during the Northern Wei dynasty.²⁷

In studying the sherds uncovered at the Baihe kiln site (part of the Gongyi kiln complex) both *qingci* and *baici* were found to be stacked and fired simultaneously, irrefutably shown by a *baici* bowl fused to a partner *qingci* bowl.²⁸ Although the excavated *baici* and *qingci* pieces share many typological features (i.e. shaping, trimming, etc.), a significant difference between them is the lower iron content in the body clay and the glaze of the *baici*. In this view, it is supposed that as the potters in the northern kilns worked to create *qingci*, they noticed the trend that lowering the iron content of the clay resulted in a whiter clay body. This realization led to further processing of the clay and glaze to reduce the iron content. Three concurrent approaches were thus developed to enhance the ceramics whiteness: lowering the iron content in the clay body, in the glaze, and in the engobe (slip). Gongxian wares show all three approaches to varying degrees. The potters at the Baihe kiln understood that this was a discovery worth pursuing and begin producing a previously unknown *ciqi* ceramic ware. How the potters transitioned from lead-glazed *taoqi* to lime-ash glazed *ciqi* remains unclear.

The Northern Wei dating of these Gongyi pieces was soon called into question by some scholars based on a typological study of the pieces found at this site. Since pieces of this style have yet to be found in any Northern Wei tombs, some scholars argue that the pieces were more likely from the Late Northern Qi and Sui dynasty thus shifting the creation of white ware from 50 to 100 years later.

II. Northern Qi/Sui Dynasty Origin

With the previous theory's dating in question, an opposing theory has arisen. Following the same basic outline of *qingci* to *baici*, it offers a slightly different view of the path taken. Huang et.al.

²⁷ Wendong Li, et.al. "Tracing the Origin and Evolution of White Porcelain in Ancient China" *Recent Advances in the Scientific Research on Ancient Glass and Glaze*. ed. Gan Fuxi.(World Century Publishing Corp. 2016): 335.

²⁸ *ibid.*, 335-337.

suggests that lead glazed *taoqi* wares were an integral but overlooked intermediary step in the development of the early white ware.²⁹

In this theory, a three stage process led to the development of *baici* and white porcelain. Stage 1 (490s-540s) occurred after the Northern Wei capital was relocated from Pingcheng to Luoyang (494). In this stage, overall production of lead-glazed *taoqi* increased, as seen in the tombs of this period. Potters began using local kaolinitic clay slip (engobe) on lead glazed pieces to produce innovative white decorative motifs (e.g. white dots or partially covered bowls). In order for the kaolinitic slip to adhere to the low-fired lead glazed clay body, quartz was added to the slip.³⁰ The addition of quartz effectively diluted the iron content of the lead glaze thus creating a paler green/white glaze. In contrast to the previous theory, Huang suggests that no *qingci* production was seen in northern China during the Northern Wei. Instead, the *qingci* pieces discovered in tombs of this time are entirely southern imports.

The second stage occurred during the Northern Qi and Northern Zhou dynasties (~550s to 570s). Northern potters continued developing the kaolinitic slip with quartz but also began recreating southern *qingci* using lead-based glazes (e.g. at Caocun- see above).³¹ Tombs of this period start to show northern lead glazed *qingci* predominating, suggesting that this northern type was replacing southern imports. Northern potters were able to achieve such a close match that visual comparisons of the glazes are virtually indistinguishable.³² One drawback of this kaolinitic slip/lead glaze method was that the high temperatures needed to vitrify the kaolinitic body clay would ruin the low temperature lead glaze. A similar issue occurred with the Tang sancai and it has been suggested that both wares may have necessitated the costly step of a dual firing process-

²⁹ Huang, *The Origin of White Porcelain Transformation of Ceramic Technology in Sixth Century North China*, pp.43, 72-73,131.

³⁰ *ibid.*, pp.43,123.

³¹ Huang, *The Introduction of Celadon Production in North China: Technological Characteristics and Diversity of the Earliest Wares*, 8.

³² Huang, *The Origin of White Porcelain Transformation of Ceramic Technology in Sixth Century North China*, Pp. 34,126.

an initial high-fire step to vitrify the kaolinitic slip onto the clay body followed by addition of the lead glaze and subsequent re-firing at a lower temperature.³³

The third stage began after the reunification of China in the Sui dynasty (581-618) and early Tang dynasty (early 7th century). During this time there was a transition from the lead glaze with kaolinitic quartz infused slip to the lime-alkali glazes on a white clay body. This allowed for a single high firing. How this transition happened is still unclear; an interesting observation is made that a series of kilns sites in Shandong (Zibo, Linyi, Xuzhou, and Zaozhuang) had been under control of the south during the Eastern Jin and Liu Song dynasties but were lost to the north during the Northern Wei. It is suggested that these kilns could have served as a bridge for bringing lime rich glaze technology from the south to the north.

Scholars agree that fine white porcelain was undoubtedly being produced during the short lived Sui Dynasty (581-618). Therefore an interesting difference between the two theories is how rapidly the development occurred. In the first theory the transition from traditional northern *taoqi* wares to white porcelain occurred at some point during the 148 years of the northern Wei dynasty, thus whether it was a slow or fast process is unknown. In the second, the transition would have occurred in the span of about 50 years, a remarkably fast development in comparison with other historical ceramic changes.

By the Sui Dynasty (581-618), kilns in Henan, Hebei, Shanxi, and Shandong began producing *qingci*, *baici*, and white porcelain on a large scale.³⁴ Continual refinements of clay and glaze resulted in the production of ever finer white wares. Regional variations in the mineral composition of the clays required each kiln site to develop their own local “recipes.” The homogenous term “white ware” therefore implies a uniformity of material composition that belies the many adaptations utilized in these early attempts. If the ratios of various mineral contents were not correct, the resulting clay body could end up with a gray buff body (like southern *qingci*) or alternatively, a white translucent clay body that would lack stability and become deformed in the kiln.

³³ Huang, *The Origin of White Porcelain Transformation of Ceramic Technology in Sixth Century North China*, 128. See also Lingtong, *Characterization of early Chinese Northern Celadon with Lead Glaze from Caocun Kiln within Yecheng Site*, 649.

³⁴ Huang, *The Origin of White Porcelain Transformation of Ceramic Technology in Sixth Century North China*, 97.

For example, Gongxian clay had a very high kaolinic content allowing for a whiter clay body. The potter's realized that the addition of feldspar could produce a piece that was sturdy enough to withstand high temperature firing without deformation. A similar process was utilized at the Xing kilns.³⁵ In contrast, other kilns had to alter the ratios of different clay combinations to achieve a sturdy pure white body. This same type of experimentation also occurred with glazes.³⁶

During the Northern Wei to Northern Qi dynasties, kilns throughout north China were experimenting with new processes leading to the formation of the world's first high fired white ceramics. Potters of the Sui and Tang dynasties built upon this foundation leading to a dramatic increase in production of some of the finest wares the world had seen.

Refinement, Mass Production, and the Resultant Shifts in Material Culture: The Sui and Tang Dynasties

Three significant government actions during the Sui (581-618) and Tang (618-906) dynasties directly stimulated the growth of ceramics. Under the centralized rule of the Sui dynasty, the Grand Canal was built to connect Hangzhou in the south to both Luoyang in Henan and Beijing in Hebei. The Grand Canal facilitated transportation of food and material goods to the north, helping to rebuild the country's economy and opening access to new markets. With the reciprocal exchange of ceramic wares between the north and south, an exchange of creative ideas also occurred. Though some ceramic forms had been seen in both north and south during the previous era this became more common, with long-stem plates, lugged jars, bowl shaped vessels and others being mass produced by northern and southern kilns.³⁷

Two policies initiated in the Tang dynasty also directly affected the handicraft industry, namely the substitution of a tax in lieu of corvee service and the ability of artisans to choose their employer. No longer having to serve corvee duty allowed for artisans to work continuously at their craft rather than taking time off to do labor for the state projects. Being able to choose who

³⁵ Zong, *Tracing the origin of Chinese early white porcelain in the late sixth century—evidence from Xing kiln*, 525.

³⁶ Guo, *Raw Materials for Making Porcelain and the Characteristics of Porcelain Wares in North and South China in Ancient Times*, 18.

³⁷ Fang, *The History of Chinese Ceramics*. trans. Lin Ma. 245.

they worked for allowed for the best potters to seek employment at the top kilns, concentrating skilled craftsmen in kilns where they could best demonstrate their handiwork.³⁸ The prolonged peace, new transportation/trade routes and increased mobility of artisans created the environment for the ceramics industry as a whole to flourish.

These developments resulted in two significant shifts in the material culture of China. First, as ceramic historian Regina Krahl points out, it was during the Tang Dynasty that ceramics “were no longer considered as cheaper substitutes for more precious materials, but were the preferred choice in many different contexts.”³⁹ In fact, the use of *ciqu* wares became so wide spread that it forced the manufactures of wood, lacquer and bronze tableware to seek other markets.⁴⁰

The integration of the new *baici* and white porcelain into the daily life of elite society is reflected in the writing and household inventory of famed Tang Poet Bai Juyi: “We eat rice and celery/ Using white porcelain bowls and green bamboo chopsticks.”⁴¹ An excavation at Bai Juyi’s home in Luoyang uncovered over 800 ceramic pieces, including many white wares.⁴² The popularity of white ware was not just restricted to the upper class. Statesman Li Zhao (806-820) pointed out that the white cups manufactured by the Xing kilns were “used by high and low alike throughout the Empire.”⁴³

One of the main influences initiating the second change in material culture was the importation of Buddhism into China. During the Northern/Southern dynasties, Buddhism had taken root in both the north and the south, though in different forms. Ch’an Buddhism had developed in the south and with it, tea drinking as a ritual practice. As an integral part of this contemplative lifestyle came the use of many objects for the processing, preparation, and drinking of the tea. The recently developed *baici*, white porcelain, and *qingci* were uniquely

³⁸ Zhiyan Li and Wen Cheng, *Chinese Pottery and Porcelain* (Foreign Languages Press Beijing 1984): 33. -see also *Chinese Ceramics from the Paleolithic Period through the Qing Dynasty*: ed. Zhiyan, Bower, Li, 203.

³⁹ Regina Krahl, “Bright as Silver, White as Snow- White Wares of North and South China” in *Bright as Silver White as Snow- Chinese White Ceramics from Late Tang To Yuan Dynasty*, ed. Kai-Yin Lo, (Yungmingtang 1988): 14.

⁴⁰ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 233

⁴¹ Zhiyan, *Chinese Pottery and Porcelain*, 40

⁴² Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 235

⁴³ Zhiyan, *Chinese Pottery and Porcelain*, 40

suiting for this. Elegant, easy to clean, relatively inexpensive compared to lacquer or jade, these pieces did not alter the flavor of the tea and could easily evolve over time to meet changing demands. The novel beauty of white ware was certainly a mark in its favor as well.

With the inclusion of these recently developed fine ceramics into the contemplative practice of tea drinking, another more subtle but significant change began to develop. Fine ceramics began to be viewed as worthy of appreciation as objects of beauty in themselves. The Tang poets with their refined sensibilities certainly took note of the new wares and commentaries on ceramics began to appear in the rarified world of poetry. Tea drinking and its associated objects rose to be an integral part of the contemplative lifestyle of the elite:

At dawn, dew still shining, I casually walk into an isolated place
With mulberry trees in the mountain, taking some mauve tea with me.
When I am tired, I will rest at springs with vapor hovering around
When I come back home, kitchen chimneys have already been smoking
To enjoy such a life, I will pay how much I could
Pi Rixiu- Tea Box⁴⁴

Those engaged in the practice of tea and contemplating of tea wares naturally began comparing and ranking different wares and their attributes. It is during the Tang dynasty that kilns first began to be “named”, a sign of increased marketing sophistication, countrywide availability, and newfound critical appraisals of the merits of the diverse wares.

The following two examples, comparing the Yue kilns with the Xing kilns (the former famed for *qingci* the latter famed for *baici*), show the refined sensibilities used in these comparisons:

Some believe that Xingzhou porcelain is better than that of Yuezhou (越州). I do not agree—for the following three advantages of Yue ware. First, Xing ware is like silver while Yue ware is like jade; second, Xing ware is like snow while Yue ware is like ice;

⁴⁴ Danying Guo and Jinrong Wang. *Old Service Tea Classic*. 2007: 48.

third, Xing ware is white and tea contained in it looks red, while Yue ware is blue and the tea looks green. -Lu Yu⁴⁵

And again, Pi Rixiu:

Craftsmen of both Xing and Yue
Show skill in making porcelain vessels,
round as the moon fallen from the sky,
Light as clouds lifted in the air;
Tea leaves whirl in cups,
Tender, the aroma lingers on the teeth....
- Pi Rixiu⁴⁶

By the mid-Tang dynasty, *baici* and white porcelain were now two of the major wares being produced (the other major wares being *qingci* and *sancai*). Indeed, the rapid rise of *baici* and white porcelain “appears seriously to have affected the demand for celadon ware in the seventh and eight centuries.... with a marked decline in the level of production of celadon wares.”⁴⁷ The major production centers were, unsurprisingly, in north China where they originated.

The Major Kilns Producing White Wares

Between the Tang dynasty and Song dynasty, Li Zhiyan lists at least fifteen large kiln complexes spread over Northern China that all were producing at least some white wares.⁴⁸ Three became

⁴⁵ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 234.

⁴⁶ Li, *Chinese Pottery and Porcelain*, 41.

⁴⁷ Mino, *Ice and Green Clouds Traditions of Chinese Celadon*, 20.

⁴⁸ These include: “...the Xing, Quyang (Ding) and Cizhou kilns in Hebei province; the Gongxian, Anyang, Xingyang, Hebiji, Mixian, Deng and Jiaxian kilns in Henan province, the Hunyuan, Hejin and Pingding kilns in Shanxi province; the Yaozhou kiln in Shaanxi, the Jingxian kiln in Anhui province....”- Zhiyan, Li. “The development and background of white and qingbai wares from Tang to Song” in *Bright as Silver White as Snow- Chinese White Ceramics from Late Tang To Yuan Dynasty*, ed. Kai-Yin Lo, 26.

renowned for the quality of their pieces: the Xiangzhou kiln, Gongyi (Gongxian) kilns, and the Xing kilns.

I. The Xiangzhou Kiln- Henan:

In the West, little has been written about the Xiangzhou kiln in Anyang, Henan. Fortunately it is beginning to receive more attention, particularly in studies of early *qingci*, *baici* and white porcelain. It is well established that Xiangzhou kiln was a major producer of *qingci* in northern China during the late Northern Dynasties/Sui Dynasty period and that at some point during this time they began producing *baici* and white porcelain, reinforcing the link between the two. Much of the writing about Xiangzhou has centered on the presumed Xiangzhou artifacts found in the tombs of two elites: Fan Cui (575) and Zhang Shen (595).

Fan Cui's tomb was thought to be the earliest example of white porcelain. Xiangzhou was then assumed to be the one of the earliest, if not first kiln to have created white porcelain. This is now disputed. Some scholars suggest that these pieces are not *ciqi*; rather they are lead-glazed *taoqi* and may have been produced at the nearby Caocun kiln (~12 miles away). Though possibly having to yield the honor of first place, these pieces are still some of the earliest white wares uncovered thus far and provide valuable evidence supporting the lead glaze to ash glaze transition theory.⁴⁹

Zhang Shen was an aristocrat of the Sui Dynasty. His tomb pieces (595) are thought to be products of the Xiangzhou kiln and were originally classified as *qingci* based on visual analysis. Chemical analysis revealed that they meet the criteria for white porcelain, showing how difficult some of these transitional period pieces are to classify. These pieces show a variety of production techniques, from white slipped clay to white porcelain.⁵⁰

⁴⁹ Shan Huang, et.al. "Developments in Ceramic Technology in North China in the Sixth Century AD" *Archaeology International* (2017): 65-66.

⁵⁰ Zong, *Tracing the origin of Chinese early white porcelain in the late sixth century—evidence from Xing kiln*, 516.

II. The Gongxian Kiln Complex- Henan

The 1956 discovery of the Gongxian kiln site in Gong County, Henan province near Luoyang marked the first discovery of a Henan kiln that produced white ware.⁵¹ As with the Xiangzhou kiln, western literature has paid little attention to the white ware products of the Gongxian kilns, most of the focus being on their sancai wares. As mentioned previously, some scholars believe it was at the Gongxian kilns that white ware was likely first produced. It is agreed that the kiln flourished in the Tang dynasty and *baici* and white porcelain were also major products of these kilns. Gongxian ware was widespread throughout the country and exported to the Middle East and East Asia.⁵²

Clay bodies from Gongxian kilns tend to be more course than their Xing counterparts and it is not uncommon to have a more grayish/buff or beige tint to the clay body rather than pure white. The potters at Gongxian are thought to have been the first to utilize a white slip to cover the imperfections in the clay body, pioneering this less expensive form of producing *baici*. Over this white slip is a transparent glaze that gives a soft yellow effect and often has crackles.

In spite of the shortcomings of the regional clay, the potters were also able to produce high quality white porcelains that were of sufficient beauty and refinement to be submitted as tribute ware to the Tang capital Chang'an (modern Xi'an). A white porcelain egg ball as thin as an eggshell, translucent, and bright white was discovered in Gongxian county in 1976 and is a testimony to the superb craftsmanship potters at this site were able to achieve.⁵³

Two excavated Gongxian pieces give us a rare glimpse into some of the daily marketing methods used by the Gongxian kilns at that time. The first, a white porcelain vase, has engraved on its belly the phrase "Vases made by Ding Daogang are superb."⁵⁴ The second is a porcelain figurine of the "Tea God" Lu Yu which multiple histories record as being given free to any

⁵¹ The main production centers of Gongxi kilns were at Baihe, Huangye, Yaohuoling, Tiejianglu, Longwangmiao, Dianguanzhan and Yangzhuchang. *Chinese Ceramics from the Paleolithic Period through the Qing Dynasty*: ed. Zhiyan, Bower, Li, 244.

⁵² Regina Krahl, *Shipwrecked Tang Treasures and Monsoon Winds*. Ed. Krahl, Regina; Guy, John; Wilson, J. Keith, and Raby Julian. (Arthur M. Sakler Gallery, Smithsonian Institution, the National Heritage Board, Singapore. 2011):207.

⁵³ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 284.

⁵⁴ *Chinese Ceramics from the Paleolithic Period through the Qing Dynasty*: ed. Zhiyan, Bower, Li, 245.

customer buying more than 10 pieces.⁵⁵ Certainly an all-around nicer offering than what is typically seen today.

Regardless of whether or not the Gongxian kilns were the first to produce *baici*, they are the first known producers in China of the famed underglaze blue and white ware. Though it did not become popular in China during the Tang dynasty, its exportation to the Persian Abbasid Empire triggered what Nigel Wood refers to as a revolution in Persian ceramics.⁵⁶ Given the breadth and quality of their wares, from *sancai*, *baici*, white porcelain, and early blue and whites, the Gongxian kiln was one of the most significant kilns during the Tang dynasty. The exportation of Gongxian wares additionally played a significant role in the evolution of ceramics throughout the world-ranking this kiln complex, though relatively short lived, of significant importance in the history of ceramics.

III. The Xing Kilns Complex- Hebei

From the seventh to tenth centuries, the most famous kilns producing white wares were the Xing kilns. A focus of praise in poetry, and in some connoisseurs' eyes ranking superior to Yue *qingci*, the products of the Xing kiln complex in southern Hebei province are considered by many to be the premier white ware during the Tang Dynasty. The kiln complex was enormous, covering two Hebei counties with at least twenty five known kiln sites.⁵⁷ Ceramics historian Li Zhiyan has divided the Xing production into three periods, Early Tang (early seventh to early eighth centuries), Mid Tang (early eighth to early ninth centuries), and Late Tang (early ninth to early tenth centuries).⁵⁸

⁵⁵ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 285.

⁵⁶ Nigel Woods Lecture: Some New Perspectives on China's Gongxian Kiln: ([YouTube Lecture: Some New Perspectives](#)).

⁵⁷ The two counties are Neiqiu and Lincheng. The kilns sites include Beidafeng, Zhongfengdong, Xiqiu, Yonggu, Xincheng, Nanling, Baijiazhuang, Beishuangliu, Nanshuangliu Fengtang, Hecun Wucun, Zhangjiazhuang, Naguan, and Ciyaogou in Neiqiu. Kilns in Lincheng include Jiacun, Qicun, Chengdi, Chenliuzhang, Gangtou, Xishuangjing, Beichengcun, Jiecun, Shanxia, and Xiciyaogou. *Chinese Ceramics from the Paleolithic Period through the Qing Dynasty*: ed. Zhiyan, Bower, Li, 205, 238.

⁵⁸ *Ibid.* Pp. 239-241.

The early Xing white wares typically have clay bodies that were “not terribly smooth.” Often they were covered in slip followed by a thin glaze which was white with a yellow tinge and frequently had drip marks. Even at this early stage a small percentage of pieces were produced that can be classified as white porcelain, some of which are very elegant, surpassing even their *qingci* counterparts. Foreign forms such as animal head shaped cups (rhytons) of Persian influence as well as Buddhist shrines were produced during this period.

The second phase of Xing ware showed a marked increase in both production and craftsmanship rivaling Yue ware in terms of popularity and beauty. It is during this stage that Lu Yu likened Xing ware to snow and silver and Li Zhao commented that Xing ware was used country wide regardless of social class. As might be surmised from this last statement, there were two broad classes of Xing white ware produced during this time: one coarse and one fine, the fine white wares being unsurpassed models of flawlessness in form and glazing. The beauty of the glaze and elegance of line made any decorations superfluous and distracting. Therefore the majority of Xing ware has little to no decorative patterns, instead allowing the beauty of the glaze and form to be admired as is. In contrast to Gongxian ware, Xing ware frequently has a cooler bluish tint to it, with a harder feel comparatively. In addition to the standard daily wares, during this phase there was also a proliferation of new forms being produced, including “leather bag” pots based on nomad’s canteens, numerous forms of ceremonial Buddhist vessels, and large incense burners that were used to perfume clothes (a subtle approach whose return would no doubt be appreciated by many).

Li Zhiyan characterizes the later stage as a further refinement, creating wares with almost no porosity that were so sonorous that water filled bowls were able to be used as musical instruments for Emperor Wuzong.⁵⁹ The Xing potters of this period were able to create pieces of such refinement that many Xing wares have marks on their underside designating the Palace departments they were intended for – the Hanlin academy, the Jade Grove Treasury, the Great Full Treasury and others- a testament to the respect and esteem these pieces were held in. It was also during this period that Xing kilns began producing high quality figurines.

These wares were not only renowned in China. Both Gongxian ware and Xing ware were exported as far as Iran, Pakistan, Egypt and Japan, with one thick rimmed conical shaped bowl

⁵⁹ *Chinese Ceramics from the Paleolithic Period through the Qing Dynasty*: ed. Zhiyan, Bower, Li, 240.

becoming so popular in Persia that its form is eponymously referred to as the “Samarra type” from the Iraqi capital of the Abbasid Empire.⁶⁰

The “shattering” of the country during the devastating An Lushan rebellion (755-763) began the downfall of the Tang dynasty and the rebellion by Huang Chao in 878 led to warfare in the region of the Xing kiln complex. These events, coupled with a series of earthquakes in the region which dried up many of the regional water resources, led to a decline in Xing kiln production. Xing kilns ceased making wares sometime during the Northern Song period.

Other important Kiln Sites:

The Ding Kiln complex- Hebei

More famed for their Northern Song Dynasty (960-1127) wares, the Ding kiln began during the Tang Dynasty and rapidly began producing pieces that even experts struggle to distinguish from Xing ware. Both kilns were situated only 100 miles apart in Hebei province and as Regina Krahl points out, the similarities in chemical composition of these kilns lead some scholars to suggest a common grouping as “Hebei white ware” stating, “(t)he fact that these white wares have become known by different names at all is mainly due to historical circumstances as in the Tang they came under different administrative regions, Neiqiu belonging to Xingzhou and Quyang to Dingzhou.”⁶¹

Though early Ding ware (sometimes referred to as Quyang ware) is often times rough compared to the Xing ware and later Ding ware, high quality pieces rivaling Xing ware were also being produced early on. Depending on the oxidation/reduction atmosphere of the kiln, the pieces can take on a bluer tone like Xing ware or a more yellow/ivory tone like Gongxian. At some point in the Late Tang/Five Dynasties period, kiln masters at the Ding kilns moved from using wood as a fuel source to coal. This gave a much greater oxidizing atmosphere in the kiln and produced the warm ivory hue that the Northern Song Ding ware became renowned for. By the Northern Song Dynasty, the Ding kilns had completely replaced the Gongxian and Xing kilns as the premier producer of white ware and white porcelain in China.

⁶⁰ Krahl, *Bright as Silver White as Snow- Chinese White Ceramics from Late Tang To Yuan Dynasty*, ed. Kai-Yin Lo, 108.

⁶¹ Krahl, *Shipwrecked Tang Treasures and Monsoon Winds*, 203.

Though the abovementioned kilns have historically received the bulk of ink, white ware was being produced throughout northern China. Two kilns of note being the Xiguan kiln in Henan's Mixian county whose ring punched decorations would later be influential for wares produced in the Cizhou kiln complex⁶² and the Hunyun kilns in Shaanxi province whose wares had a style distinct from Hebei and Henan and were able to produce bowls with a very bright white glaze.⁶³

As archeological excavations continue, more kilns are being discovered that are not included in the known historical records, an example being the recent discovery of a workshop in Yiyongjie near Luoyang whose wares show a different production method than potters at the Xing, Gongxian and Anyang kilns were using.⁶⁴

Conclusion

Much is contained in the simple phrase "Southern Celadon/Northern White". The evolution of *baici* and white porcelain occurred sometime in the sixth century during a tumultuous period of Chinese history. The creation of these wares demonstrates a truly stunning achievement: the ceramic industry in the north that had been essentially dormant for centuries due to civil unrest, rapidly reached a level that could challenge the southern kilns that had been producing glazed stoneware for millennia. Further, within two centuries potters were able to produce white porcelain of such high quality that it was exported to the farthest reaches of the trade routes and became the inspiration of potters world-wide. This is certainly a tribute to the ingenuity and skill of the potters who were able to use the knowledge base derived in the south, adapting it to the local conditions of their area, and through widespread experimentation and hard work, develop a ceramic ware that continues to this day.

In the West, our love affair with the individual imbues our historical view with an attraction for the "sole" discoverer, be it of the printing press or of the Americas. A discovery spread over a century certainly grabs the attention less than the excitement of an Archimedean "Eureka", but perhaps the appreciation of a generational collaboration of inventive craftsmen

⁶² *Chinese Ceramics from the Paleolithic Period through the Qing Dynasty*, 245-246.

⁶³ Fang, *The History of Chinese Ceramics*. trans. Lin Ma, 289.

⁶⁴ Shan Huang, et.al. "Early Experimental White Porcelain from a Newly-Discovered Production Centre in Luoyang, North China" *Journal of Archeological Science*. (2022): 2

working towards a common goal, replete no doubt with innumerable unnamed individual discoveries, may offer a view of humanity far more worth cherishing.