

Production and Trade of Porcelain in China, 1000-1500

Shelagh Vainker

Ashmolean Museum, Oxford

Email: shelagh.vainker@ashmolean-museum.oxford.ac.uk

Just as the Song dynasty (960-1279) has been identified by economic historians as a peak after which no significant developments took place, so it is a period of culmination in the manufacture of ceramics. Between the 10th and 12th centuries, green, black or white high-fired wares that had been produced for centuries were made with finer bodies, smoother and more complex glazes and in a greater range of shapes than ever before, and in unprecedented quantities. They also became admired and moreover collected as objects of aesthetic, cultural and monetary value, a practice that had previously been restricted to works of art such as calligraphy and painting, or to the jades and bronze vessels associated with high antiquity and the authority to rule. This was also however the period in which was established China's most enduring and famous kiln site, Jingdezhen. To that extent the period is not only a technological peak, but a pivotal one during which the centre of the ceramics industry began its shift from north to south China. At the time when the northern kilns were producing pieces for the imperial court and wares that would be adopted into the canon of connoisseur's collectibles, southern kilns were making pots for everyday local use, and for export. In many instances, these imitated the northern wares in both technology and style; all were part of a country-wide industry with a distribution of manufacturing centres that was unprecedented and has not been repeated, for it is notable that during the pre-eminence of the north in potting, the south was also rich in kiln sites and products, while once the shift south had occurred no significant industry continued in north China. The principal kiln site of the Ming and Qing dynasties was, as has been mentioned, Jingdezhen in Jiangxi province, which by the fourteenth century had become the kiln that produced pots for the court until the end of empire in the early twentieth century; though there were in fact many additional kilns in that province. Other southern potting centres were Longquan in the southern part of Zhejiang province on the east coast; Fujian province to its south; and to a lesser extent Guangzhou (Canton) on the south coast. In the north, the only Song kiln complex still in production by the mid to late Ming dynasty was Cizhou, across Henan and Hebei provinces. The products of many of the kilns mentioned above were exported, appearing at sites from Africa to the Philippines. In several destination areas, ceramics from China

influenced local ceramic industries either through technology transfer, or in simulated appearances. This paper will seek to elucidate the relationships between different kiln centres within China and beyond, as demonstrated by similarities in appearance of the wares, through considering the transfers or innovations in technology that made these possible.

North China 10th-12th centuries

Following the founding of the Northern Song dynasty (960-1279) with its capital at Kaifeng in the northern central province of Henan, several kilns that had been operating during the Tang dynasty (618-906) began producing wares of very high quality and fine appearance – Ding and Yaozhou particularly – while other, newer ones were also set up: Jun, Ru, Cizhou. The white wares of the Ding kilns and the blue-green Ru wares were used in the imperial palace and are the only ones to be mentioned in contemporary literature, though others became lauded from the 13th century onwards. However both kilns produced a much wider range than was presented to the court - the Ru kilns for instance also made black wares and three-coloured wares – and the imperial wares were special products from kilns that were otherwise comparable to those across north China. Examples of the wares are known from kiln sites, pagoda treasure stores, tombs and overseas sites. The kiln sites are useful in revealing what was not seen as fit to preserve in other contexts; pagoda deposits include pieces with specific functions and of exquisite quality; tombs contain objects from everyday life that the deceased or their families considered worthy accompaniments, and these are broadly similar to those that were exported. Ceramics were exported by both land and sea: an office was established in 1084 at Lanzhou in Gansu province to oversee the Silk Route trade while maritime customs offices were set up in 971 at Guangzhou (Canton), in 989 at Mingzhou (Ningbo) and in 1087 at Quanzhou in Fujian province. Some types of northern wares were exported in greater quantities than others, with Ding wares going as far west as Africa while Ru wares are hardly found outside central north China.

The green, black, white, blue and purple glazes of northern wares sometimes provide the sole decoration of the pots, but they might also be embellished with carved, incised, moulded or painted designs, or through combinations of glazes on a single ware. The means of achieving these effects reveal instances of technological exchange between the

various kilns, the principal one being the use of moulds. Moulds were used at the Ding kilns in Hebei and the Yaozhou kilns in Shaanxi, and seem to have been introduced in the early 12th century. The replacement of the two stages of modelling and decorating with the single process of pressing clay over a mould already carved with ornament, and in the required form of bowl or dish, speeded up production. Another innovation had the additional economically advantageous effect of maximising use of space within the kiln. Northern sedimentary clays require long firing at high temperatures, so that fuel type is significant, and this period saw a switch from wood to coal. Coal is abundant in the region, and much more compact than wood; a firebox for the latter occupied the whole width of the kiln, whereas one for coal required only one third, thus releasing space for more wares in each firing. These were stacked high in saggars (rough clay firing cases for individual pieces) to make use of the kiln height. The disadvantages of coal are a short flame length, large amounts of clinker produced during firing, and difficulty in controlling a reducing (oxygen-limited) atmosphere. The short flame length gave rise to a narrower higher kiln (known as *mantou* kiln after its resemblance to northern bread-buns of that name), the clinker was dealt with by creating deeper ash-pits, and kiln atmospheres were largely oxidising rather than reducing. The notable exception is Yaozhou with its iron-rich reduced green glazes, but elsewhere the glazes show the typically warm tones produced in oxygen-rich kiln firings.

South China 10th-12th centuries

The colour tones arising from differently-fuelled kilns are the most immediate way to distinguish a northern from a southern ware. The shapes, decoration and setting techniques of Ding ware were all adopted by kilns in Jiangxi province but the glazes, rather than being soft ivory in tone, were light blue. Both are referred to as white wares but the southern pieces contain titanium impurities in the glaze and were fired in a wood-fuelled reducing atmosphere. They are known as *qingbai* (literally 'blue-white') wares. A little less far south in Anhui province, white wares were made and it is recorded that 'In Su and Si (modern Anhui), Ding ware is made', raising the question of how precisely these southern imitations might have been marketed. Such white wares dominate southern production and though made largely in Jiangxi province, similar pieces were also produced in Fujian province. Fujian also produced quantities of black wares, with glazes similar to northern ones but usually in the form of teabowls. Tea drinking was a

feature of monastic and court life and some bowls are incised on the base with characters meaning 'for presentation'. *Qingbai* wares however are not mentioned at all in texts and do not seem to have featured in collections until the late 19th or early 20th centuries when their Song dating caused a perceptual conflation with the grander, traditionally sought-after and increasingly scarce wares of that period. A third kiln area was Longquan in southern Zhejiang; during the tenth century kilns there began making green glazed wares in imitation of the famous Yue wares of northern Zhejiang, though it was not until the late 12th and 13th centuries that large-scale production was established. The Yue kilns themselves, which during the Tang dynasty had produced some of the most prestigious of all Chinese ceramics, were in gradual decline after the beginning of the Song in the 10th century.

Of Jiangxi, Zhejiang and Fujian, Jiangxi was already the most significant at the beginning of the 11th century. When in 1004 Jingdezhen was established on the site of the 10th-century Hutian kilns, porcelain taxation there began. By 1077 each locality in Jingdezhen was paying taxes equivalent to that of a whole county, and this increased tenfold by the end of the Southern Song dynasty in 1279; tax was due according to the firing capacity of a kiln, excluding the firebox, observation holes and so on. The clay of south China is porcelain stone that has undergone silification, making it strong, and sometimes kaolinisation as well; the clay around Jingdezhen is highly kaolinised, making it more pliable and particularly suitable for potting. Wood fuel was abundant in the surrounding hills. Wood-fired kilns across south China are of a design developed in the first few centuries AD, known as 'dragon' kilns. Typically built into hillsides, they consist of successions of firing chambers that can extend for sixty metres or more, providing huge capacity; openings at the sides allow fuel to be added and oxygen to be excluded. At Jingdezhen however, a different kiln design was used. Known as a 'double-gourd' kiln after its shape in plan, it was something of a hybrid of the southern dragon kiln and the much smaller, oval *mantou* kiln of the north. Borrowing of elements of kiln design suggests that the circulation of styles involved movement of people, and not simple reproduction through observation of traded wares. Mixed adaptation is seen not just in kiln design but also in the setting methods and the wares themselves. For example, many *qingbai* ware bowls and dishes are unglazed at the rim because they have been fired upside-down. Upside-down firing was used at the Ding kilns, where a stepped saggar was devised that could hold several items at once if they were placed upside down in a single

saggar with ledges inside. This increased further the loading capacity of a high narrow kiln designed to suit fuel with a short flame length. It was therefore not necessary in the south, but was used anyway. A similar misappropriation is demonstrated in the shapes of *qingbai* wares: many Ding wares have a sharply angled profile, while many others have lightly lobed rims and bodies yet in the south, both features appear on single pieces which otherwise copy the pale glaze and incised ornament of the northern ceramics.

This type of imitation is tightly-focussed however when considered alongside a fourth southern kiln that existed principally to reproduce the wares of other kilns. Xicun was situated just north of Canton, and exported wares that might have come from almost any of the kilns mentioned above (providing perhaps that they were not viewed side by side). Excavations there have revealed sherds that look like Yaozhou greenwares, Jingdezhen *qingbai* wares, northern and southern black wares, and a type of brown painted ware that is identified as Xicun type but which looks to have been inspired by either iron-painted Yue wares, or northern Cizhou wares. This painted type however does not outnumber the other, imitative types. Northern kilns influenced one another and southern kilns imitated northern ones but Xicun, sited as it was so close by a major port, imitated everything. The reception of Xicun and other exported wares can be assessed by looking at some of the contexts in which they have been found, and an interesting example is provided by the sutra burial mounds of 12th-century Japan. Sutras, alongside groups of other objects, were buried in large containers and though they are not placed in elaborate architectural structures as the Chinese pagoda deposits were, the religious context must have been revered, and the accompanying objects it may therefore be assumed were held in some esteem. The containers, and the ceramics within them, were of Chinese manufacture. The small ceramic boxes and dishes within were southern wares of ordinary quality including *qingbai* pieces and painted wares of Xicun type; the containers themselves of greenware, but roughly modelled. It has been suggested that this might be because they were a commissioned type poorly understood at the point of manufacture. Japan produced no porcelain before 1600, so it is possible that these pieces were nonetheless well regarded at the point of consumption, while the kilns at Xicun and Fujian are indicative of large demand for ceramics from China. Ship design also developed to accommodate bulky cargo, though the suitability for deepwater sailing meant the vessels only went as far as the southwest Indian coast. Private shipbuilding of vessels up to 600 tons took place at Fuzhou, Mingzhou, Zhangzhou and Canton, though

with the loss of the north to the Jin in the early twelfth century and the establishment of a new capital for the Southern Song dynasty at Hangzhou in Zhejiang, Canton ceased to be a significant port. Quanzhou, much closer to Hangzhou on the southeast coast, became the principal port, and the Xicun kilns followed the Cantonese port's demise.

South China, 13th-15th century

The Southern Song dynasty (1127-1279) was a period when export markets became increasingly important to the ceramics industry. The large scale of production and countrywide distribution of kilns during the Northern Song dynasty was part of a thriving economy, and the swift exchange of technology and styles between the kilns attributable in part to the growth in medium-sized market towns and communications between them. Afterwards, through the later 12th and the 13th century, ceramic production was concentrated in the southeastern provinces of Jiangxi, Zhejiang and Fujian, with the latter two being major export regions; it was not until the 14th century that Jingdezhen wares were exported on a large scale. At that time, the styles and destinations of the Longquan and Jingdezhen wares shared many similarities, particularly large scale porcelains (mainly dishes) for the Middle East, decorated with floral scrolls that were incised on the greenwares from Longquan, and painted in blue on the white Jiangxi porcelain; by the late 15th century Longquan production had declined and Jingdezhen was the main exporter of porcelain. In the 12th and 13th centuries however the export trade consisted largely of Zhejiang and Fujian wares, with many examples found across east and southeast Asia. These are well documented alongside Jiangxi wares in the slightly later wreck of a ship that was destined for Japan but sank off the Korean coast some time after 1311, and in the first half of the 14th century, probably before 1330. No blue-and-white wares were on it, but thousands of *qingbai* porcelains, Longquan greenwares and Fujian black wares, all in forms and with ornament current in ceramics for domestic consumption. This is particularly evident in the incense burners and other forms derived from ritual bronze forms, which would have had resonance in either Korea or Japan, but not further afield.

The early 14th century was also the period in which underglaze painted porcelains were first made in quantity. Painting directly onto the modelled, partly dried body before glazing and firing became the standard technique for porcelain decoration, though it was

later combined sometimes with incised decoration, or the addition of enamel painting over the glaze, which required a second firing. Such overglaze painting first occurred during the 15th century. The 18th-century examples are so fine not just because pigments and firing had improved, but also because of one final 14th-century innovation. The addition of kaolin to porcelain clay made it more plastic, therefore easier to work, and smoother, thus providing a finer ground for the painted ornament. Added in small quantities to begin with, by the mid-18th century the body composition of fine wares was 50/50, hence the extraordinarily fine appearance of Yongzheng (1726-35) and Qianlong (1736-95) period *famille rose* wares. Other subsequent technical innovations were glazes, which were manipulated to resemble wood, lacquer, bronze or otherwise create simply rich monochrome surfaces.

It was in the late Ming (1368-1644) dynasty that one of the most influential technological developments took place at Jingdezhen: the introduction of the egg-shaped kiln. The double-gourd kiln of Song Jingdezhen was particular to that kiln site, and the same was true of the egg-shaped kiln. It required specialist construction, which was controlled by the Wei clan, and its main advantage was that it allowed different temperatures and different kiln atmospheres within a single firing. This was despite an interior length of only 10-15m, perhaps a quarter the size of a standard southern dragon kiln. It was oval in plan and elevation, resembling half an egg cut lengthways, with the firebox at the large end and a tall chimney at the small. Inside was a single firing chamber where a heavy reduction atmosphere prevailed in the main part, with a neutral area two-thirds along, while true oxidization occurred at the small end by the chimney, by allowing some cold air to enter through the roof. Because there were no lengthy firing sessions at full heat, fuel consumption was low – about thirty to fifty tons for a capacity of 250 cubic metres.

This design was established at a time when non-government trade was illegal, as it had been for much of the Ming dynasty. A considerable amount of exchange took place however and wares from both Jiangxi and Fujian occur at sites around southeast Asia in particular. The development of blue-and-white porcelain in Fujian at the end of the Ming period coincided with the loss of imperial patronage at Jingdezhen and the development of overseas markets, especially Japan, stimulating in turn the beginning of porcelain manufacture there.

Seventeenth-century wares from Arita, Fujian and Jingdezhen are not always easily distinguishable, but that discussion is beyond the scope of this paper. The relationships between kilns in China in the period 1000 to 1500 has been only broadly outlined. There is much more to be said about the appreciation of ceramics and the effects that had on markets and production. The technological relationships could be examined in detail within the different kiln groups discussed and the discussion could likewise be expanded to consider China's role in global ceramics, but I hope this overview of ceramic production during a crucial period of transition and development has raised some points that would be useful in either of those discussions.