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The white stonewares on the Belitung wreck comprised some 300 items, all of them made in northern China. Most of them represent tablewares. As with green wares, two distinct qualities can be distinguished, reflecting the production of different kiln centres in Hebei and Henan. Among them are examples of probably the finest ceramic wares available at the time, and some of the earliest true porcelains made in China. They also include the only complete examples discovered so far of China's earliest blue-and-white ware.

China's fame as a ceramic-producing country is based on its production of porcelain. Porcelains are closely related to stonewares, so closely in fact, that the Chinese language does not distinguish at all between the two. In the West, the term porcelain is used for ceramics which are fired at even higher temperatures than stonewares, around 1350°C (while for stonewares a firing temperature of *c.* 1280°C is characteristic), and which – unlike stonewares – are white, translucent and resonant. In practice, there is no distinct dividing line between the two but a smooth transition.

The development of high-fired ceramics in the north took a course completely different from that in the south. Nigel Wood has repeatedly demonstrated that, geologically, the stoneware and porcelain raw materials in the northern part of China, i.e. very roughly the area north of the Huanghe (Yellow River), 'are rich in clay minerals while stoneware and porcelain 'clays' south of the divide tend to be rock based and rich in fine quartz and micas'.[1] And it would seem that for the first two millennia or so of China's historic period, the two regions developed their ceramic traditions quite independent from each other. Although the origins of stoneware production in the north can equally be traced to the Shang dynasty (*c.* 1600–*c.* 1050 BC), this part of China lacked the continuous development which characterizes the south.[2]

After these early beginnings, it is only in the sixth century, almost two millennia later, that stonewares appeared again in northern China, the intervening period still being shrouded in mist. From that time onwards, however, the northern stoneware industry developed rapidly, with a varied range of green, black and white wares appearing all more or less at the same time. White wares, at that time unique to the north, became as much associated with it as green wares were with the south.

In the Tang dynasty (618–907) white stonewares were made by several northern manufactories. Superficially they all look quite similar, but they can vary considerably in material and workmanship. The most important distinguishing feature, perhaps, is that their transparent glazes can cover either a pure white body, or a pure

**1** Wood 1999, 27, with a map, 26; cf. also above pp. 119–122.

**2** White wares made of a pure white clay and fired at temperatures just high enough to qualify as stonewares, have been discovered at sites of the late Shang dynasty at Anyang in Henan province. These rare examples are finely made, fashioned in shapes and decorations imitating contemporary bronzes, but are lacking a glaze. No continuous development of stonewares can be detected from these early beginnings, and at present they still have to be considered as isolated experiments, rather than the origins of north China's stoneware production.

white slip which in turn hides a non-white body. The former requires a very finely prepared clay without impurities. Such stonewares with a pure white body and a highly glossy, translucent glaze with a tendency to run down the vessel surface in thick glassy drops were made by the Xing kilns in Neiqiu and Lincheng counties, Hebei province, already prior to the Sui dynasty (581–618).[3] In the Tang dynasty, the body ranged in colour from pure white to cream-white and can be translucent and resonant. The glaze tends to be very thin, and often has an attractive bluish tinge due to the use of wood as fuel and to firing in a reducing kiln atmosphere; more rarely it is tinged with yellow due to oxidization. Tang dynasty Xing ware can be fired at temperatures of up to *c.* 1350°C, and can reach the level of true porcelain.[4]

The appearance of sturdy ceramics which did not easily crack, crackle or chip, which were and remained dense and immaculately clean, and were elegant at the same time, must have seemed almost miraculous at the time.[5] Surfaces as bright, glossy and smooth as those of the best Tang white wares were known only from precious metals and precious (or semi-precious) stones. As Yue wares evoked in Chinese connoisseurs the image of jade, Xing wares evoked that of silver. This was first written down between 761/2 and 777 in *The Classic of Tea* by the tea connoisseur Lu Yu (739–804/5), who compared Yue to jade and Xing to silver, Yue to ice and Xing to snow.[6] While Lu professes a personal preference for Yue ware as tea bowls, he relates that some of his contemporaries ranked the white bowls of Xing ware highest.

In the eighth and ninth century, however, Xing white wares and Yue green wares developed side-by-side, the former representing the finest ware of the north, the latter that of the south. There are many parallels in the range of shapes produced by the two manufactories, but silver shapes with sharp, angled profiles are peculiar to Xing ware. The reputed use of twelve Xing and Yue ware bowls filled with varying amounts of water, for playing a musical scale, which is recorded for the 840s, is related below (p. 354) in connection with Yue ware. References to Xing can be found in the literature particularly between the mid-eighth and the late ninth century, which was probably the period of its greatest popularity. It was not only popular for tea but also for wine: in a poem composed between 821 and 824 jade cups and Neiqiu bottles are mentioned by Yuan Zhen (779–831) in connection with different wines. A reference by Li Zhao (active early ninth century), written sometime after 824, that white porcelain bottles from Neiqiu and Duan inkstones are used by everybody, the noble as well as the lowly, has often been taken as evidence for the wide distribution of these items among the populace.[7] However, given that Xing ware has survived in such small numbers and, like Duan inkstones,

**3** See Jia Zhongmin et al. 1987, 1–10.

**4** Since a precise piece-by-piece distinction between stonewares and porcelains is impossible, the term stoneware has been chosen here to designate all white wares found on the wreck. The term is here used in a general sense for high-fired ceramics, '*ci*' in Chinese, rather than in its specific sense, as distinct from porcelain.

**5** Yutaka Mino and Katherine R. Tsiang consider the advent of these white wares to have seriously effected the demand for celadon wares for some time (Mino Yutaka and Tsiang 1986, 20).

**6** For an english translation of the text see Carpenter 1974, 90–93.

**7** Zhou Lili 1982, 277.

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was always considered as particularly desirable, Li Zhao's remark must be taken as an overstatement, written perhaps to impress on the reader the affluence and prosperity of the times. Xing is even said to have been a tributary ware to the court (cf. above p. 245).

Appreciation was certainly great enough to inspire imitation. Close copies were made during the Tang dynasty by another Hebei manufactory, the Ding kilns at Quyang, which were located nearby, somewhat further to the north. The Tang dynasty products of the two can be so similar as to be difficult to distinguish (fig. 1).[8] Both kiln centres still fired with wood at that time, their glazes can therefore both have a bluish tinge. Only around the end of the Tang dynasty, when the Xing kilns started to decline, did the Ding kilns switch to coal as fuel, which, due to the greater oxidization in the firing, gave their white wares the ivory tone generally associated with Ding.

The differences between Tang Xing and Ding white wares have been studied by a number of researchers, and the same, or almost identical, objects are still being attributed to both manufactories.[9] On the whole, however, the findings would seem to indicate that in the Tang dynasty the Ding kilns were imitating Xing, rather than developing their own characteristic features. Although the two wares were similar, Xing is unfailingly described as superior in quality and workmanship. A very smooth body and even

**8** E.g. Zhou Lili 1982; Fan Dongqing 1991; Richards 1984–85, etc.

**9** In *The Complete Collection of Treasures* 1996, compare two bowls of 'Xing' ware, pls 82 and 83, with two bowls of 'Ding' ware, pls 96 and 97.

**Fig. 1** Xing ware (*left*) and Ding ware (*right*) bowl fragments (after Fan Dongqing 1991, 48, fig. 2).

glaze application, without obvious streaks or tear marks, are ascribed to the products of the Xing manufactories.

The Hebei white wares found on the Belitung wreck are of very high quality. They are characterized by thin potting, and diligent use of the knife for subsequent trimming. Shapes are therefore delicate and precise, with exacting profiles and neat foot rings with sharply cut edges (cf. no. 86). Rim lobes on bowls and stands are cut, while the corresponding raised ribs are created through the application of slip, crisply shaped with a knife (cf. nos 88, 89). Occasionally the simple marking of the rim lobe through a line of slip is elaborated into a decorative triple line fanning out from the rim (cf. no. 90).

The pure white body material has a remarkably fine texture; the application of a slip – diluted white clay – as found on other white wares, was unnecessary (cf. also above pp. 129–130). Although the body does not look strongly vitrified, being neither glassy nor translucent but instead rather chalky and matt, the pieces were clearly high-fired, and produce a clear sound when struck. The surface is evenly covered with the thinnest layer of glaze, usually of a bluish tinge, which degrades easily because it is so thin. Generally the glaze shows no crazing, but often minute bubbles. In terms of purity and smoothness of the body, evenness and clarity of the glaze, and precision of the profiles, the examples found on the wreck can be classified among the best white wares known from this period. Similar

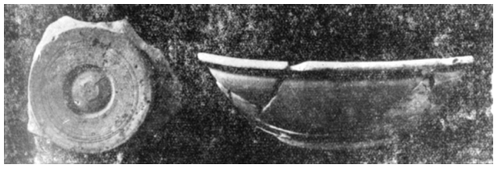

**Fig. 2** Xing ware bowl fragments from the kiln sites in Lincheng county, Hebei province (after Yang Wenshan and Lin Yushan 1981, 41, fig. 4).

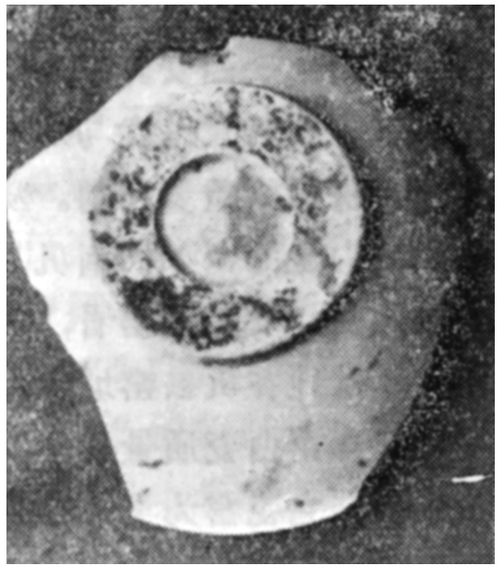

**Fig. 3** Xing ware bowl fragment from the Qicun kiln site in Lincheng county, Hebei province (after Li Huibing 1981, 47, fig. 8).

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pieces have been excavated from the Xing kiln sites (figs 2, 3).[10] The Hebei white wares on the Belitung wreck have here therefore been attributed to the Xing rather than the Ding kilns.

The Xing ware bowls were intended for tea, like the similarly shaped bowls of Yue ware; they all show the classic *bi*-disc foot (nos 86–88). Cups come with and without handles (nos 91–94), and sometimes have the sharply angled profiles of contemporary metalwork (no. 95). The fact that they were made in white but not green ware confirms the intended association with silver. The exact use of the handled cups has not yet been determined. Those without handles might have been used for wine, together with stands (nos 89, 90), although they are rather large. It is tempting to believe (although completely unsubstantiated) that a stand like no. 89, that was excavated in Luoyang from the reputed site of the house of the Tang poet and renowned drinker Bo Juyi (772–846), might have been used in this way.[11] The wreck did not contain any Xing ware wine bottles.

Two white ewers (nos 96, 97) for hot water, to be used in the preparation of tea, represent a type made by several kilns at that time. They can not be attributed to the Xing kilns with as much confidence as the pieces above, and might equally have been made by the Ding kilns. Decoration is absent from all Hebei white wares, except for some thin incised horizontal lines, which may or may not represent intentional ornamentation (nos 92, 94, 95).

Xing and Ding were not the only white wares made in Tang China. The desire to create ceramics with a clean white surface may have been fairly universal, but mostly it was curtailed by clays firing grey or buff, or containing impurities which resulted in dark spots. At Gongxian in Henan the craftsmen soon discovered that they could simulate the effect of a pure white ware by covering their somewhat coarse and impure off-white clays with a layer of white slip, and this method spread also to other kilns. Besides in Hebei, kilns making Tang white ware have also been discovered in Henan, Shanxi, Shaanxi and Anhui provinces.[12]

At a casual glance, Gongxian wares closely resemble Xing wares. The application of the slip did suffice to render the body smooth and even, the glaze clean and sparkling, and the whole piece pure white. A closer look, however, reveals considerable differences in material and craftsmanship. Gongxian white wares are much more heavily potted and less carefully finished. The body material, which generally is visible at the foot, is much less fine, and impure. The glaze is less clear and glassy, and in combination with the slip often produces a creamy tone. The Henan wares were fired at lower temperatures and in a less reducing atmosphere. Whereas Xing wares are akin to porcelain and can indeed reach

**10** The material published so far from the Xing kiln sites is, however, still scarce; bowl and cup fragments related to pieces on the wreck are illustrated in Yang Wenshan and Lin Yushan 1981, 41, figs 4–6; Li Huibing 1981, 46, fig. 3, and 47, figs 4 and 8.

**11** Mino Yutaka 1998, 102, fig. 43.

**12** Li Zi Yan and Chan Liang Zhu 1988, 10.

that stage (with firing temperatures as high as 1350°C for some of them[13]), Gongxian wares are slip-covered stonewares. These white stonewares were not the only and perhaps not the most important product of the Gongxian kilns; the kilns are better known for the colourful lead-glazed earthenwares made in the first half of the Tang dynasty for burial purposes. Their white wares were nevertheless held in high esteem, a large quantity of sherds having apparently been found even at the Tang imperial palace site, Daminggong, at Xi'an.[14]

The Gongxian white wares on the wreck are well made, although the potting is somewhat clumsy and shapes can be warped. They have a coarse-grained body of greyish to pale buff or pale beige colour, generally containing impurities in the form of tiny dark specks, which makes the application of a slip indispensable (cf. also above pp. 122–126). The slip is applied in thick layers, often more than once. The glaze is transparent, has a faint yellow tinge, and tends to be strongly crazed. In combination with the slip it can, in the best cases, take on a beautiful, creamy ivory tone.

The wreck contained Gongxian bottles, jars, and bowls. The large bowls were probably intended for food (no. 106), while the large covered jars, either with or without a spout, may have been used for storing wine (nos 100–102), and the bottles for serving it (nos 103, 104). The bottles have the same shape as some Yue bottles on the wreck (nos 140, 141), with side lugs for fastening a cover or for carrying; this shape is otherwise rarely seen.

A very small group of slip-covered white stonewares on the Belitung wreck differs from the Gongxian examples, by being superior in material but inferior in workmanship. These pieces have a relatively fine-grained, smooth body, probably light buff or off-white in colour but on the outside now strongly discoloured by iron. The white slip was, however, carelessly applied and is not reaching down to the base. The general appearance is quite rough, the potting thick, and profiles are not very distinct. These pieces might have been made by a different Henan kiln centre, such as, for example the Hebiji kilns at Hebi.[15] They include a bowl with *bi*-disc foot (no. 98), and a small cup with flared rim (no. 99). They may have been loaded on board in southern China by chance, their different origin not having been noticed and not of any consequence to the customers further west.

At the time of the Tang, the production of high-fired stonewares was unique to China. The clean and sparkling appearance of Tang white wares was admired abroad in particular. Early Chinese white wares from various manufactories have been found, for example, in Brahminabad, Siraf, Samarra and Fustat, but also at many other sites in Mesopotamia and further into Iran.[16] It was

**13** Wood 2000, 98.

**14** Tan 1993, 3.

**15** Compare a white ewer from the kiln site in *Ceramic Finds from Henan* 1997, cat. no. 17.

**16** Crowe 1975–77, 264ff; see also above pp. 68–69, 80–81.

not so much their style that appealed – beautiful ceramics were also made elsewhere; it was of course their practicality, but perhaps even more so their translucency that beguiled foreign observers. It was undoubtedly admiration of Xing ware which caused an Arabian merchant named Sulayman to write, in 851, that 'the Chinese have a fine clay of which they fashion drinking vessels that are as delicate as glass and through which one can see the water, despite that they are of clay and not of glass'.[17]

Although neither this quality – translucency – could easily be reproduced with the earthenware clay at their disposal, nor the Chinese ware's hardness and density, Mesopotamian potters nevertheless set out to emulate the Chinese wares, by using Chinese shapes and covering their pottery with opaque white tin glazes (fig. 4).[18] Without the superb material to recommend them, undecorated white wares in quiet, unpretentious shapes were probably rather limited in their appeal. Thus, their style was developed further, and the Middle East suddenly saw the production of white wares both in non-Chinese forms and with non-Chinese coloured decoration.[19] The influx of Chinese ceramics to the Near and Middle East in the eighth and ninth centuries is believed to

**17** Lindberg 1953, 24.

**18** A Chinese white bowl is compared with an Islamic imitation in Crowe 1975–77, pl. 104a.

**19** Ibid., 266f.

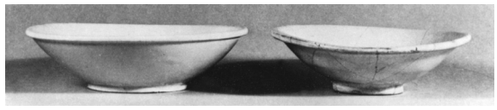

**Fig. 4** Tang white stoneware bowl (*left*) and contemporary Mesopotamian copy (*right*). Percival David Foundation, London (after Crowe 1975–77, 276, pl. 104a).

**Fig. 5** Blue-and-white bowl from Iraq. 9th century. Private collection (after Crowe 1975–77, 276, pl. 104b).

have given the much needed impetus for a new inspiration of the ceramic craft in that region at that time.

Perhaps the most striking innovation of the Islamic potters was the utilization of cobalt for blue painted designs on white pottery. They at first applied cobalt to their new white wares with great restraint, for painting palmettes, garlands, palm trees, and some 'pseudo-calligraphy' (fig. 5).[20] Even though painted lines are generally somewhat thick and fuzzy, since the pigment tended to diffuse into the surrounding glaze, the cobalt used in Mesopotamia yielded such a clear and bright colour that the blue-and-white effect is most attractive. It soon became one of the favoured pigments for decorating ceramics in the Middle East.[21]

In China cobalt had been employed as a glaze colour for monochrome and polychrome burial pottery at least since the eighth century.[22] The origin of the cobalt used on Tang ceramics is still under discussion. Recent studies have shown it to be distinctly different from that used in Mesopotamian pottery, and thus refute the previously held belief that it came from Iran.[23] Lead-glazed earthenwares in various colours including cobalt-blue were the main product of the Huangye kilns in Gongyi Municipality, former Gongxian, in Henan province until the mid-Tang period.[24] It is therefore not surprising that cobalt-blue painting was also tried out on the high-fired white wares made in this region. Although as yet no Tang blue-and-white stonewares appear to have been discovered at the kiln site, their Gongxian origin is evident, since in material and workmanship they are practically identical to the kilns' monochrome white wares.

The appearance of blue-and-white vessels in Mesopotamia and in China around roughly the same time is intriguing. Unfortunately, the exact time of the introduction of cobalt-blue decoration to Middle Eastern ceramics is still a matter of debate, since the Mesopotamian examples cannot be dated precisely; and firm evidence for dating the Chinese examples is equally lacking. Blue-and-white stoneware fragments have been excavated from the site of the Tang city of Yangzhou and from some other sites, but their number is very small and the utilization of cobalt as a pigment for painting white stoneware was apparently very short-lived. The first complete examples have come to light on the present wreck, which also provides the most specific clues so far for their dating.[25]

Three dishes recovered from the Belitung wreck (nos 107–109) show for the first time complete designs. Their main feature is a quatrefoil motif based on a single or double lozenge, surrounded by palmette-like fronds of leaves. The few sherds discovered in China are the remains of bowls,

**20** See ibid., 267 and pl. 104b, for a bowl in a private collection in Teheran; Sarre 1925, pl. XVIII, for fragments excavated at Samarra.

**21** Porter 2000.

**22** Cobalt had already been used in China in the Warring States period (475–221 BC) for glazed faience beads. The time of its introduction as a glaze colour for pottery vessels is still a matter of debate. From the eighth century onwards it was used fairly frequently, but may already have been experimented with in the seventh.

**23** Wood (forthcoming).

**24** See Gongyi Municipal Office 2000, passim.

**25** A pillow fragment is said to have been found in a stratum together with a *kaiyuan tongbao* coin, a type minted between 713 and 741, but used for a long period of time; see Nanjing bowuyuan fajue 1977, 29. A blue-splashed box fragment discovered at Luoyang is tentatively attributed to before 841, on account of a lack of coins from the Huichang reign under emperor Wuzong (841–846); see Cheng Yongjian 2000.

dishes, a ewer, a pillow and a box, with similar or simpler designs (figs 6, 7).[26] More elaborate decoration would have been difficult to achieve, since the blue painted lines tended to blur.

These palmette and lozenge motifs do not easily fit into the repertoire of Tang ornamentation (see also above pp. 235–238). The relationship with the designs of contemporary Mesopotamian blue-and-white bowls, however, is striking. A bowl such as illustrated in fig. 5 would have provided a perfect model, with its quatrefoil design with four fronds of leaves surrounding an indistinct Arabic/Persian inscription which fills a roughly square field. The lozenge motif on the Chinese versions can also be outlined in a series of consecutive strokes rather than each side being drawn in a continuous line. This could be due to the fact that the cobalt solution sank in so quickly that longer strokes were difficult to achieve; or else it could be a sign that the painters were copying a model not fully understood, and it might well be Arabic writing which caused the Chinese painters to hesitate in their strokes.[27]

Blue-and-white ceramics certainly did not accord with the prevailing Chinese taste of the time, where coloured ceramics were used for funerals.

**26** The fragments have been published, for example, in Nanjing bowuyuan fajue 1977, 29, no. 9 and pl. 2:1; Zhang Pusheng and Zhu Ji 1985, 67–71, no. 10; Wang Qingzheng 1987, pls 1–3; Wang Qinjin 1994, 417, fig. 4:14.

**27** Nigel Wood has suggested yet another possibility, namely that the Chinese painters inadvertently might have copied a difficulty encountered by the Mesopotamian painters who painted on dry glaze rather than on the biscuit, as in China (personal communication).

**Fig. 6** Tang blue-and-white pillow fragment from the site of the Tang city of Yangzhou, Jiangsu province (after Wang Qingzheng 1987, pl. 3).

The admiration for plain white vessels for use among the living was based on their perceived similarity with silver. Regarded from this angle, any coloured decoration would have spoiled the desired effect. Tang blue-and-white was most likely made basically for foreigners. Virtually all the sherds found in China come from Yangzhou, the main international port at the time.[28] The pieces on the present wreck may well have been loaded on board in that harbour, too, for shipment to the Middle East.[29] With the changing fortunes of the maritime trade to western Asia, however, it is not surprising that the production of such pieces was short-lived. It would seem that Gongxian blue-and-white wares remained no more than isolated experiments, produced in very small quantities, and that the style was abandoned soon after it had been developed.

The Yangzhou fragments have been much publicized and researched in China, and hailed as the earliest representatives of China's blue-and-white porcelain tradition. Technically they – like also the complete pieces from the wreck (nos 107–109) – do indeed represent China's first high-fired ceramics using the blue-and-white colour scheme. But with their heavy, slip-covered, non-white bodies they can hardly be considered proper porcelain. In addition, they are fundamentally different from, and in their evolution unconnected to the wares from the southern kilns of Jingdezhen, which began to make cobalt-blue painted porcelain in the Yuan dynasty (1279–1368), and from that point on until today have made virtually all of China's blue-and-white. But even once this momentous development began in the fourteenth century, it was to take around a century for the new colour scheme to become truly popular in China. The ninth-century activities can be seen as a trial run, albeit unsuccessful in the long term, in the history of blue-and-white porcelain.

**28** Only the box fragment (Cheng Yongjian 2000), which may or may not be an example of Tang blue-and-white stoneware (see note 26), came from a tomb site, at Luoyang in Henan.

**29** See in this volume pp. 38f., 83–91

**Fig. 7** Tang blue-and-white bowl fragments from the site of the Tang city of Yangzhou, Jiangsu province (after Wang Qingzheng 1987, pls 1, 2).