

陶瓷考古

通讯

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No.7, July 2016

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摘要

1. 九世纪唐代与伊拉克青花器物研究新探：以伊朗西拉夫遗址发现为核心

奈杰尔·武德 赛斯·普里斯特曼

摘要：伦敦大英博物馆藏有一批从伊朗港口城市西拉夫（尸罗夫）考古发掘出土且数量较大的遗物。这批藏品在 1966 年至 1973 年间入藏，但近来才整理编目。在一万七千多件出土的石器、金属器、玻璃器和陶瓷器（包括大量从唐至清代的陶瓷残片如炆器、瓷器等）中，迄今仅知有一片饰有高温钴蓝彩的唐代白釉炆器。这一早期的青花炆器装饰效果与元明清青花瓷器相通，属于“蓝色点彩”类型，与 2004 年在中国河南巩义（巩县）白河窑发掘出土的装饰效果类似青花的唐代低温和高温两类陶瓷标本都有关联。这件瓷片的同类型参照物也见于香港大学博物馆收藏的一件完整的唐代高温炆器罐，该罐同样是在白底上稀疏地装饰着钴蓝彩斑点和短线状图案。截至目前，这件西拉夫高温炆器残片是中东地区发现的唯一一件带青花装饰的中国唐代器物标本，因此对于研究东西方贸易，以及中国与中东这两大陶瓷传统在公元九世纪可能发生的陶瓷技术和装饰风格交流具有极高价值。

在西拉夫，还有很多的伊拉克青花陶器与这片唐代炆器共存于考古遗存中。其中大多数装饰中东典型的钴蓝色棕榈叶、花卉或书法彩绘，但也有少数装饰类似于唐代青花炆器的蓝色斑点和短线状图案。西拉夫遗址还发现数量众多装饰绿色斑点的中国白釉绿彩炆器，以及类似装饰风格的中东白釉绿彩陶片。

出现在这一时期的中东青花陶流行时间较短，但却备受欢迎。它们很有可能从九世纪二十年代的某一时间起开始在伊拉克地区制作，持续了不到一百年。遗留下来的标本主要是典型的九世纪中国碗类造型。然而伊拉克青花陶的装饰几乎始终都是中东的风格，这使得学者认为这一时期的青花器可能是中东地区独立的创新。在本文之前，由于在该地区缺少唐代中国青花器物（无论是高温还是低温烧）的发现，这一观点得到加强。相反，在萨迈拉和西拉夫等中东遗址出土的大量唐代白釉绿彩炆器，被广泛认为对中东陶器在八世纪晚期至九世纪的发展产生了巨大影响。

然而本文发表的这片西拉夫出土的中国青花炆器以及共存的同时代装饰题材类似的中东青花陶片，可能意味着我们需要重新审视九世纪中东青花陶器是独立出现的这一观点，尽管伊拉克“蓝色点彩”器应该处在整个伊拉克青花陶器编年体系中的哪一具体位置，仍待研究。

关键词：唐代、青花、白釉绿彩、伊斯兰陶瓷、西拉夫、巩县

New Light on Chinese Tang Dynasty and Iraqi Blue and White in the Ninth Century: The Material from Siraf, Iran

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Abstract

A large collection of excavated material from the port-city of Siraf in Iran is held in the British Museum, London. The material was collected between 1966 and 1973 but only recently catalogued. Among some seventeen thousand pieces of stone, metal, glass and ceramic from the Siraf site, including many Chinese ceramic sherds of the Tang dynasty to the Qing dynasty, is a single shard of Chinese Tang high-fired white stoneware with cobalt-blue decoration. This early blue and white ware is of the 'blue-spotted' type that can be related to both low-fired and high-fired examples of the Tang dynasty excavated from Gongyi (formerly Gongxian) Henan, China in 2004. The shard can also be compared to a complete high-fired Tang stoneware jar in the University of Hong Kong Museum that is also sparsely decorated with cobalt-blue spots and dashes on a white ground. So far as is known the high-fired Siraf sherd is the only example of Tang dynasty Chinese blue and white found in the Middle East and therefore of prime interest in the study of East-West trade, interactions that may have operated in the ninth century between these two ceramic traditions.

Numerous sherds of Iraqi blue and white earthenware material were also found at Siraf. Most show typical Middle Eastern palmette, floral or calligraphic cobalt-blue painting, but a few used blue spots and blue dashes and appear similar to the Tang blue and white shard itself. Siraf also yielded a number of Chinese white-glazed stoneware sherds decorated with green spots, together with Middle Eastern green-on-white glazed earthenware sherds made in a comparable style.

Middle Eastern blue and white at this time was a short-lived, though highly-prized production and probably made in Iraq from sometime in the 820s onwards, and for less than one hundred years. Surviving examples are mainly bowls of typical ninth century Chinese form. The decoration of Iraqi blue and white however is almost always of Middle Eastern style and this has led scholars to think that blue and white of this period may have been an independent Middle Eastern innovation. Until now this view has been reinforced by the lack of any Chinese Tang dynasty blue and white sherds (whether low fired or high-fired) having been found in the region – unlike the masses of green-on-white glazed Chinese wares excavated at sites such as Samarra and Siraf, and which are widely regarded as having had a

strong impact on the development of Middle Eastern ceramics in the later eighth and ninth centuries.

The Chinese shard itself, and the contemporary Middle Eastern shards of ‘spotted’ blue and white found in the same context at Siraf, may mean that this view should be re-assessed, although just where the Iraqi ‘spotted blue’ shards should be placed in the overall chronology of Iraqi blue and white earthenware is still an open question.

Key Words: Tang Dynasty, blue and white, green-on-white ware, Islamic ceramics, Siraf, Gongxian

Introduction

Among the many remarkable objects in the British Museum’s reserve collections is a small triangular piece of glazed ceramic about three centimetres long with pale blue spots in its transparent white glaze (Fig. 1). This is believed to date from the ninth century AD and to have been made in China. It is therefore an example of the first high-fired blue and white ware in the world, and a true ancestor to what must be the single most successful and productive style in ceramic history, namely Chinese blue-and-white. But perhaps more remarkable still is where the sherd was found – not in China itself, but some seven thousand miles away by sea in the ancient port-city of Siraf in present day Iran.¹



Figure 1. Sherd 2007, 6001.5010 in the British Museum’s Siraf material collection, ninth century AD. © Trustees of the British Museum.

Siraf

Siraf is on the northern shore of the Persian Gulf in the modern province of Bushehr. It was an important deep water port that flourished from the mid-eighth to the early eleventh century AD. The port is backed by mountains and has few natural resources but as a centre for international trade it grew to become a large and prosperous city until its decline in the later tenth century. This followed a major earthquake that destroyed parts of the city in about AD 977.²

Siraf was well-placed to receive the Arab *dhow*s that plied a coastal trade that reached as far to the east as the ports of Yangzhou and Guangzhou in China, with sea journeys that were measured in months and timed to the monsoonal winds.³ Cargoes were often transferred to smaller boats at Siraf to be taken northwards to Basra in present day Iraq, and then on to the Tigris and Euphrates rivers for transport towards the major urban centres in the heartlands of the Abbasid empire. Basra was an important but treacherous port, due to its sandbars and rapid currents (Fig. 2).⁴

Besides its trade with China, Siraf handled volumes of ninth-to-tenth century Iraqi ceramics that were exported from Basra, and these have been found in countries as



Figure 2. Map of the Middle East showing the relationship between Siraf, al-Basra, Samarra and al-Fustat. (Developed from freevectormaps.com)

various as Portugal, Mozambique, China, Japan, and Thailand.⁵ All the Iraqi wares were low-fired, mainly using yellow-buff lime-rich clays. Their glazes were often rendered white with a few per cent of tin oxide, in many cases to evoke the character of imported high-fired Chinese wares.⁶ Some bore cobalt-blue painting and were examples of the Abbasid blue and white tradition.⁷ However, despite the volumes of ceramics produced in Abbasid Iraq, no kilns from this date have been excavated in the region and it is still largely speculation where these many different styles of early Islamic glazed-wares were made.⁸

The Gongyi kilns

The most likely source for the blue and white fragment from Siraf (reg. no. 2007, 6001.5010) in the British Museum is the Gongyi (formerly Gongxian) kilns in Henan province in northern China – an important site in China’s ceramic history and a kiln-complex famous for its production of polychrome lead-glazed wares and white-slipped glazed stoneware in China’s Tang dynasty (AD 618–907).

In 2004 the widening of a country road some four miles from Gongyi’s city centre led to a major ‘rescue excavation’ at the nearby Huangye and Baihe kilns.⁹ The kilns were already known as the source of some spectacular polychrome lead-glazed burial wares made for royal and aristocratic Tang families, particularly in the early eighth century.¹⁰ Many examples were uncovered in the course of the sixth-month excavation at Huangye, but a surprise to the Henan archaeologists was a wealth of *sancai* ware of simpler style that seemed to date from the later eighth and ninth centuries. This was a time when the production of funerary *sancai* had all-but ceased in China, so these ‘second generation’ *sancai* wares are thought to have been everyday wares or, perhaps more likely, made for export.¹¹

Among the mid-to-late Tang finds at Gongyi were light-bodied wares with transparent lead glazes and copper-green ‘splashes’.¹² These proved to have exact parallels in sherds found in the Middle East, particularly at Samarra in Iraq. Samarra was newly founded as the capital of the Abbasid caliphate in AD 836 and grew rapidly into an extensive city spread over nearly forty kilometres along the north banks of the Tigris. The city enjoyed only a brief period of florescence before the caliphal capital was moved back to Baghdad in AD 892 (Fig. 2).¹³ A small part of this vast site was excavated between 1911 and 1913 by the German archaeologists Friedrich Sarre and Ernst Hertzfeld.¹⁴ Chemical analysis was later used by Sarre in Berlin to distinguish Abbasid Iraqi copies from the original Chinese export wares and Sarre found examples of both types among the Samarran material. This analytical approach was

resumed in the late 1980s at the British Museum when sherds from Samarra, Mantai (Sri Lanka) and al-Fustat (Egypt) were compared with material from the Gongxian (Gongyi), Xing and Yaozhou kilns.¹⁵

More recently, in 2008, a sophisticated method of ‘chemical finger-printing’ placed some lead-glazed green-and-white export wares from the famous Belitung wreck specifically to the Gongyi kilns.¹⁶ The ‘Belitung wreck’ was an eighteen metre long Arab *dhow* laden with tens of thousands of pieces of Chinese ceramic that foundered off Belitung island, south-east from Sumatra, in the second quarter of the ninth century¹⁷. The ship was sailing west at the time that it sank following a well-established route that may eventually have led to the port of Siraf.¹⁸ The vessel was built by western Indian Ocean construction methods that used hardwoods from East Africa or India, ‘cross-stitched’

together with fine rope in a ship-building style still current in Oman.¹⁹

Other finds at Samarra that imitated imported Chinese wares were copies of high-fired Changsha wares (green and white, and light-brown and dark-brown) and local versions of imported white Chinese porcelains, possibly from the Xing and Ding kilns of north China, as well as white-slipped glazed stonewares from Gongyi.²⁰ It is remarkable that all these Chinese kilns were hundreds of miles inland and had initially supplied Chinese markets until demand from the Abbasid Empire, and also from south-east Asia, led to huge productions of export wares in the ninth century. These were transported by waterways to the ports of Yangzhou, Ningbo and Guangzhou in south-eastern coastal China, and then by sea to their various international markets.²¹



Figure 3. Low-fired (left) and high-fired (right) blue and white from Tang levels at the Gongyi, Baihe, kilns, Henan province, north China. Henan Provincial Institute of Cultural Relics and Archaeology et al, 2005.

Blue and white at the Baihe Gongyi site

In addition to the high-fired whitewares, and the low-fired green-splashed wares, found at Huangye, Chinese archaeologists also uncovered another style of lead-glazed ware at the adjacent Baihe kilns but in this case decorated with dots and dashes of cobalt-blue glaze, or simply glazed overall by the blue glaze itself (Fig. 3, left and Fig. 7, right.).²²

A relatively rare use of cobalt blue in Gongyi *sancai* wares was already known from the early eighth century but the blue colour was used here towards the end of the Tang dynasty on less prestigious wares and applied in a simpler and broader style. No examples of these low fired ‘blue and white’ Gongyi wares have been found in the Middle East so their intended markets remained something of a mystery. But perhaps the most important of all the finds from the Baihe site were some high-fired wares decorated with simple dots and dashes of cobalt-blue painting. These high-fired wares used cobalt-blue designs on the standard Gongyi white ware material and can be regarded as the true ancestors of China’s high-fired blue and white tradition (Fig. 3, right).²³ It is to this class of mid-to-late Tang dynasty Gongyi blue-and-white that sherd (reg. no. 2007, 6001.5010) seems to belong.

But why spots and short dashes?

One intriguing aspect of this subject is the problem of why early high-fired Gongyi blue and white was decorated with simple dots and dashes of blue, rather than the more painterly style of blue decoration, so familiar in later Chinese blue and white? The reason for this stylistic feature seems to lie in the apparent origin

of high-fired Gongyi blue and white in its earlier low-fired lead-glaze *sancai* tradition.²⁴

A study of Tang dynasty *sancai* ware shows that the coloured lead glazes were rarely applied by structured painting. The preferred technique was to build up ‘glaze-mosaics’ using areas of colour that merged at their boundaries during firing. When more definition was needed this was often supplied by strings of dots of coloured glaze, rather than by painted lines. This style has sometimes been explained as imitation of Central Asian tie-dyed, ikat or wax-resisted textiles, where the colours merge in a subtle manner rather than appearing in sharply-defined zones.²⁵ Although exotic textiles from lands to the west of China seem a likely source for many Tang *sancai* designs there may also be a technical aspect to the effect that has more to do with the practicalities of *sancai* manufacture. This arises because the potters were dealing with rather fusible coloured glazes that tended to spread slightly in firing. By contrast, ceramic pigments are concentrated sources of colouring oxide that melt less in firing, and tend to stay where they are painted, making finer detail easier to achieve. The excavations at Gongyi show that the later low-fired Gongyi export wares used simplified *sancai* patterns, modified from the funerary *sancai* repertoire, and that the high-fired Gongyi blue and white material excavated at Huanghe followed this traditional approach (Fig. 3). Surviving and whole examples, made in this style in the blue and white material, are rare but the University of Hong Kong has a high-fired version (Fig. 4).

Iraqi blue and white



Figure 4. Gongyi later Tang high fired blue and white showing (left) dotted line of cobalt-blue painting (Henan Provincial Institute of Cultural Relics and Archaeology et al, 2005) and (right) tripodal fu water pot, Tang dynasty stoneware with white slip and stoneware glaze, with cobalt-blue decoration, H: 7.5 cm D: 9 cm, Collection of the University Museum and Art Gallery, The University of Hong Kong, HKU.C.1953.0028.

The blue-spotted sherd from Siraf is certainly an object of great significance in the history of Chinese ceramics, but it may also be important in understanding another major blue and white production, that of Iraqi blue and white itself – a tradition that contains some of the most admired ceramics in early Islamic art.

Visitors to one of the great collections of Islamic art, at Doha in Qatar, will approach the museum, built on its own island, via a palm-lined causeway.²⁶ On entering the cool and low-lit building they are met by a single spot-lit bowl – a particularly fine example of Islamic blue and white earthenware. This ninth century bowl bears a calligraphic inscription in Kufic script from its right-hand rim to its centre that has been translated as “What was done was worthwhile”. The bowl is a measure of the quality of Islamic blue and white and also the high regard in which this style of early Islamic ceramic is held. The production of these wares seems to have been short-lived, perhaps only one hundred years or less from sometime in the 820s, which adds to both the rarity and the mystique of the style.²⁷ Mesopotamian blue and white wares are usually attributed to Iraq, particularly to the port-town of Basra, although there

is still no firm evidence for Basra’s role in their production.²⁸ They are all low-fired and most (although not all) use a few per cent of tin oxide in their glazes to render them white.

The majority of Iraqi blue and white consists of bowls, typically about 20 cm in diameter, with rolled rims that enhance the hollow forms and it is generally thought that they follow the shapes of typical Chinese bowls of the ninth and tenth centuries.²⁹ This bowl-form with its soft and rounded edge was used throughout China in the later Tang dynasty, from the Ding ware kilns in the north of China to the Changsha, Yue and Xicun kilns in the south.³⁰ However, while the forms of these famous Abbasid blue and white wares seem borrowed from China their blue-painted ornament is hugely varied, but almost exclusively local in style. Sparing Arabic calligraphy is a popular theme (usually finely spaced and painted) but geometric and floral designs also appear, as do stylised patterns of palm trees or palm fronds – usually referred to as ‘palmettes’ in the literature.³¹

It is this lack of Chinese influence on the painted blue



Figure 5 (left) Chinese blue and white shard, probably from the Gongyi kilns (2007, 6001.5010) with two blue and white Iraqi ninth-century sherds (2007, 6001.9860 and 2007, 6001.7459). All excavated at Siraf by David Whitehouse, © Trustees of the British Museum.

decoration that has made most scholars believe that the idea of painting plain white wares with cobalt blue designs was an independent development of early Islamic ceramic art and that, although the ceramic forms may have been influenced by China, the 'blue and white' concept itself was not. Indeed high-fired Chinese blue and white is often described as originally inspired by Middle Eastern blue and white.³² This was a well-developed view before Tang blue and white was discovered, but it has also survived its discovery because most excavated examples (apart from the Gongyi material itself) seem decorated with patterns of Middle Eastern style, in particular the three high-fired Chinese blue and white bowls from the Belitung wreck that are painted with typical Abbasid palmette designs.³³ Jessica Hallett summed up this view in 2011 when she wrote: *'Cobalt blue painting appears to be an independent initiative of the Basran potters, who later spurred the development of ninth century Gongxian blue and white.'*³⁴

A further strong argument against a Chinese influence on the birth of Iraqi blue and white has been the absence of any Tang dynasty blue and white material, whether low-fired or high-fired, in any eighth or ninth

century Middle Eastern context, which made the imitation of Chinese blue and white by Islamic potters seem far less likely.

However, it is against this background that the full importance of the Siraf blue-spotted Gongyi sherd begins to emerge as it removes one important objection to a possible Chinese influence on the Abbasid blue and white tradition – the lack of evidence for any ninth century blue and white ware of Chinese style being exported to the Middle East from China. But this in turn raises a further question: Could this Chinese blue-spotted ware, as represented by the Siraf find, have had any influence on Middle Eastern potters in their manufacture of the Iraqi blue and white material?

Blue spotted Iraqi wares

It is on this last question that we can return to the British Museum's Siraf finds, which contain a number of sherds of ninth or ninth-to-tenth century Iraqi blue and white. Most show typical Abbasid designs in calligraphic, geometric or palmette spirit, but a fair number show simple spots instead, much like those on the Chinese sherd from the same site and period (Fig. 5).



Figure 6 (Left) Chinese green-spotted ware (mid-to late ninth century, 2007, 6001.8731) and early Islamic sherds (ninth to tenth century) 2007,6001.8243 and 2007,6001.8239. Excavated at Siraf by David Whitehouse, © Trustees of the British Museum.



Figure 7 Left, centre-left and centre-right, early Islamic monochrome blue-glazed shards 2007,6001.8917, 2007,6001.6941 and 2007,6001.8917, excavated from Siraf (Iraqi, ninth century), The British Museum (© Trustees of the British Museum); and right, low-fired blue monochrome jar, excavated at Baihe, Gongyi, mid-to-late Tang dynasty, Henan Provincial Institute of Cultural Relics and Archaeology 2005.

Simple spotted Iraqi blue and white wares have few parallels in extant and complete Abbasid wares, but they occur regularly in the excavated Siraf material. Stylistically they also appear related to some Chinese spotted green-on-white wares also found at Siraf, together with Middle Eastern shards of a similar appearance (Fig. 6).

What we may be looking at is a more direct axis of influence that could predate the more painterly types of Iraqi blue and white – although this is not to say that simple spotted decoration would not then have continued as part of the wider design repertoire in the Iraqi blue and white tradition.

It is interesting too that the Siraf finds include examples of three plain blue opaque glazed sherds, similar to

Chinese Gongyi wasters of the same date from Baihe (Fig. 7).

Dating

One important aspect of this subject must be the question of when export sancai wares first reached the Middle East from China, and when the transfer of ideas between China and the Middle East first occurred. It seems sensible in this regard to look at the earliest styles of Islamic fine wares for any clues to this process. In fact some provisional dates have been applied to a type of Middle Eastern ware that Oliver Watson has called the ‘yellow glaze family’.³⁵ This used an early palette where lead-stannate yellow and copper-green glazes were combined, sometimes with brown or white, to create glaze-patterns, mainly on bowls.³⁶ Watson has shown that this style spread from Egypt to Syria and



Figure 8. (Left) Low fired blue and white bowls. Baihe kiln, Gongyi, mid-to-late Tang dynasty, Henan Provincial Institute of Cultural Relics and Archaeology 2005. (Right) Bowl with opaque white glaze and coloured glaze-designs. Iraq or Syria, 8th-9th Cs. 11.4 cm diameter. Copyright ©, The al-Sabah Collection, Dar al-Athar al-Islamiyyah, Kuwait.

Iraq in the eighth century, and that it seems to represent the earliest type of Islamic fine glazed ware. Watson has convincingly argued in his 2004 book, and in recent papers, that many of these early ‘yellow glaze’ finewares were made in an entirely local style that evolved initially without any influence from imported Chinese ceramics.³⁷

Nonetheless this early glaze palette was soon replaced with the new ‘opaque white glaze’ style, opacified with tin oxide. With regard to the bowl on the right in Fig. 8, Watson notes that ‘... similar bowls are found on many sites throughout Iraq and Syria.’, and he dates the piece to the ‘eighth to ninth century’.³⁸ As noted by Wood and Tite in 2009, this particular bowl can be compared to a couple of mid-to-late Tang dynasty vessels from the Gongyi Baihe excavations (left, Fig. 8).³⁹ Thus it could be argued that ‘export sancai’, such as that made at the Gongyi Huangye and Baihe kilns had a direct and early impact on Middle Eastern potters.

The cobalt-blue pigments

Study of the Middle Eastern blue and white sherds in Chinese style found at Siraf (Fig. 5) shows that the blue is often raised slightly on the whiter ground. This suggests that the Iraqi potters may have used blue glazes for the spotted and dashed decoration, rather than concentrated cobalt-blue pigments, which tend to lie flat on the glaze-surfaces. A similar ‘glaze-on-glaze’ method is also seen on some Abbasid blue and white sherds that were excavated near Hira in Iraq in the 1930s, and are now in the Ashmolean Museum at Oxford.⁴⁰ These were analysed by Wood et al for a 2008 study that compared Iraqi Abbasid and Tang Chinese low-fired blue and white.⁴¹ In one of the Iraqi blue and white sherds found at Hira, a plain alkali-lime glaze, without tin or lead oxides, gave the white background, while the raised blue ornament was a very similar glaze but with a small amount of cobalt-ore added to it. The compositions of both glazes proved close to Abbasid period Iraqi glass.⁴²

Altogether three styles of Abbasid cobalt blue pigment were established by the Oxford study. These were the

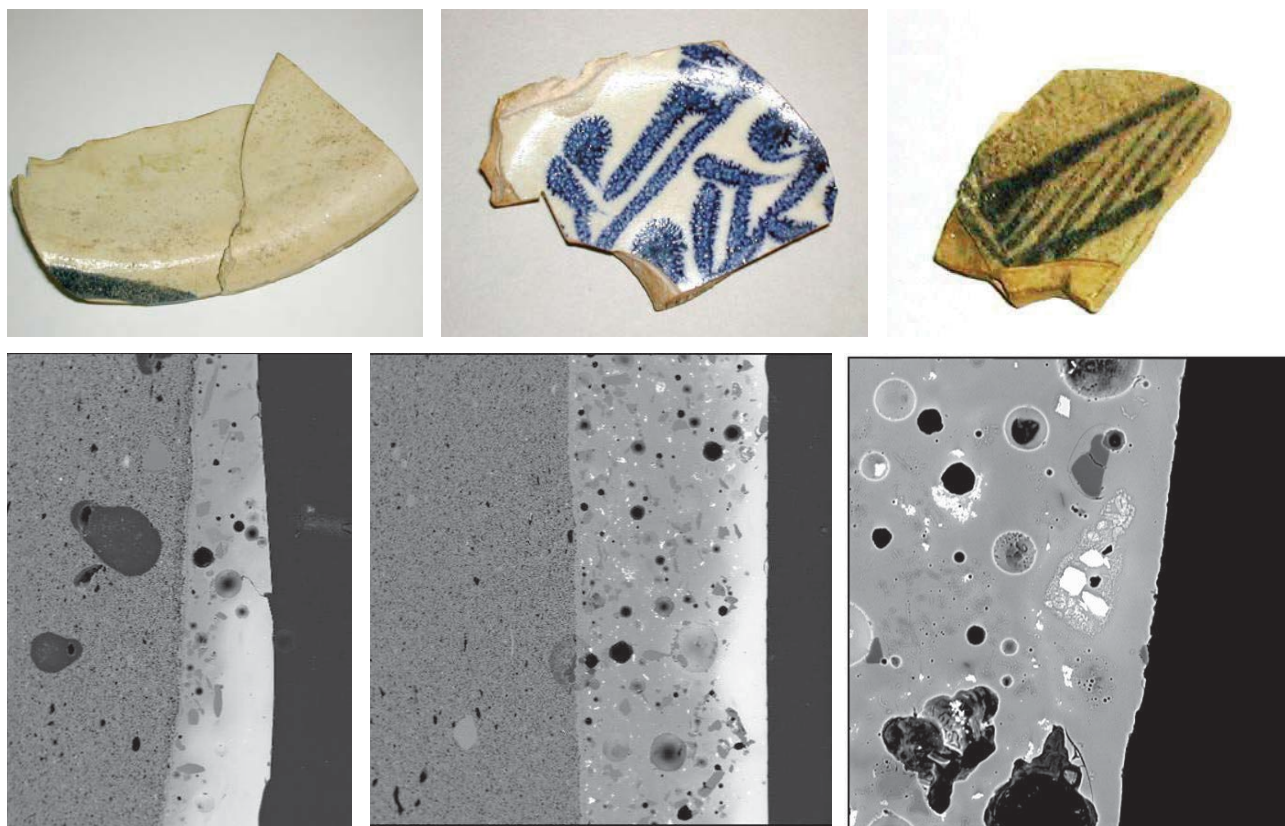


Figure 9. Sherds from Hira, Iraq, Ashmolean Museum, Oxford. (Left) Raised 'blue glaze' type (no tin oxide). Backscattered SEM Image. (Centre) 'Spreading' pigment plus lead oxide type. (Note small white specks of tin oxide in the glaze; the blue pigment is the lighter region at the glaze surface.) (Right) Cobalt-ore type. (The larger white dots near the glaze surface are particles of the iron-zinc-cobalt pigment). (Wood & Tite 2009)

'blue glaze' type (see Fig. 9, left), a second type that used a blue pigment with additions of lead oxide that caused the blue painting to spread dramatically on the white-glaze-ground (centre), and a third that showed the use of a simple cobalt-ore, consisting essentially of the cobalt-iron-zinc pigment itself (right). All the white background glazes were of the alkali-lime type and similar to Islamic glass, although some contained a few per cent of lead oxide. The majority (although not all) were rendered whiter with tin oxide, and all the decorations were applied to the glaze-surfaces.⁴³

In all the Abbasid blue and white sherds studied so far the cobalt ore has proved to be a cobalt-iron-zinc compound and it seems that Abbasid glass-makers and potters shared a common source, as similar proportions

of zinc occur with cobalt and iron in Abbasid blue glass.⁴⁴ It is not known for certain where this ore was mined, but Turkey has been suggested recently as a known source for this type of cobalt-rich rock.⁴⁵ By contrast the Tang Chinese potters at Gongyi also used an iron-cobalt ore, but with no zinc present and with a much higher percentage of cobalt oxide.⁴⁶ Again the source is unknown – the Middle East is often suggested although there is presently no evidence to support this view. In Tang dynasty China both low-fired and high-fired cobalt-decorated wares seem to have used this same pigment.⁴⁷

Conclusion

A single sherd of high-fired Gongyi-style blue and white ware, now in the British Museum, was excavated

from a ninth century context at Siraf in southern Iran. It is of the blue-spotted type that can be compared to other blue and white wares, both high-fired and low-fired, found in mid-to-late Tang levels at the Gongyi Baihe kilns in China. This particular group seems entirely Chinese in style and derived from Gongyi's earlier sancai tradition. Middle Eastern sherds of a similar blue-spotted type were associated with the Chinese sherd at Siraf and it also seems that Chinese sancai wares, made in an export style, can be related to some Middle Eastern ceramics of the eighth-to-ninth centuries.

Taken together, these details raise the possibility that Iraqi potters may have taken exported Chinese wares as models for the manufacture of a particular type of Abbasid blue and white – providing another important layer of support to an increasingly rich body of information regarding early long distance East-West exchange. This information allows us to show archaeologically that early transfers of ceramics took

place between China and the Middle East, and that stylistically and technically this had a direct impact on production across both ceramic traditions. Such a process also suggests a high degree of integration in the decision-making processes connected with the mass production of ceramics (a commodity market). The vehicle that facilitated this communication was the Indian Ocean. The outcome was the early emergence of sophisticated market forces operating across far-removed sectors of the globe and far back within the pre-modern era.

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¹ Excavated by David Whitehouse and catalogued as part of The British Museum Siraf project, 2007-2009, led by Dr Seth Priestman. See Priestman 2007 and Priestman 2011. The online catalogue contains 16,734 artefacts. (http://www.britishmuseum.org/research/collection_online/search.aspx?searchText=Siraf)

² Whitehouse 1975.

³ Hsieh Ming-liang 2010a. Shanghai to Basra, for example, is more than 7000 nautical miles (8000 statute miles) and a modern voyage at 10 knots, using the open sea rather than a coastal route, still takes thirty days.

⁴ Hallett 1999.

⁵ Hallett 2010. (See map, fig. 60, p76). However, some Abbasid ceramics may have been the personal wares of Middle Eastern traders, and therefore not strictly 'export'.

⁶ Rawson et al 1989; Wood and Tite 2009.

⁷ Tamari 1995; Rawson et al 1989.

⁸ Even the traditional association of Basra with Abbasid blue and white manufacture has been questioned recently. (See Priestman 2011 and also Oliver Watson at a University College London study day in February 2016.)

⁹ Henan Provincial Institute of Cultural Relics and Archaeology et al 2005; Li Baoping 2008.

¹⁰ Rawson et al 1989; QiQi Jiang 2009.

¹¹ Henan Provincial Institute of Cultural Relics and Archaeology et al 2005.

¹² Liu Yang 2010, p274 (notes) places 'Early Tang' to AD 608-741, 'High Tang' to 742-779 'Mid-Tang' to 780-835 and 'Late Tang' to 836-907, The so-called 'splashed wares' used coloured glazes dabbed

on with a brush that merged and spread into the background glazes during firing.

¹³ Northedge and Kennet 1994 p21; Northedge 2005, fig. 2.

¹⁴ Sarre 1925. See Burgio et al 2007, p.758, for a concise summary of these excavations.

¹⁵ Rawson et al 1989, using Chinese kiln site material supplied by Professor Zhang Fukang.

¹⁶ Baoping Li et al 2010. The technique is known as ICP-MS – inductively coupled plasma mass spectrometry – and can measure forty trace elements in a single ceramic sample (p. 178). See also Hsieh Ming-liang 2010b.

¹⁷ Krahel 2010, p53.

¹⁸ Hsieh Ming-liang 2010a, p137.

¹⁹ Hsieh Ming-liang 2010a, p139. Flecker suspects that the ship may have been dismantled and re-stitched in the Far East before its last voyage, perhaps using hemp or hibiscus rope (Flecker 2010, p117). For an account of reconstructing a similar vessel using the same techniques see Vosner 2010.

²⁰ Wood et al 2009.

²¹ Hsieh Ming-liang 2010a.

²² Henan Provincial Institute of Cultural Relics and Archaeology et al 2005.

²³ Li Jiazhi et al 1986 describe the technology of the standard Tang Gongxian (Gongyi) whiteware material.

²⁴ Wood and Tite 2009.

²⁵ QiQi Jiang 2009.

²⁶ The Museum of Islamic Art, Dohar, Qatar, was designed by the Chinese-American architect I.M. Pei (born 1917) at the age of 91. It is regarded as among his finest creations.

²⁷ Hallett 1999.

²⁸ Strictly the site was al-Basra ‘... modern al-Zubayr, situated 16km to the west of modern Basra.’ (Priestman 2011). Priestman reviews the evidence for and against al-Basra as a major ceramics production centre for opaque glazed ceramics and concludes that, while there seems is nothing inherently wrong with the idea that the majority of opaque glazed wares was manufactured in the al-Basra area, it is important to draw attention to the fact that the evidence cited in support of this hypothesis is so far inconclusive. (Priestman 2011, p102).

²⁹ Hallett 1999.

³⁰ Krahel 2010.

³¹ Tamari 1995.

³² Medley 1976 p176.

³³ Oliver Watson believes that these three high-fired blue and white bowls from China may have been sample-prototypes, prepared for a potential Middle Eastern market (pers. comm. to NW, May 2016).

³⁴ Hallett 2010. In terms of blue and white’s longer history, it is interesting that cobalt blue inlay was used on the white non-clay ceramic material Egyptian faience as early as the mid second millennium BC. See Friedman and Borromeo 1998, p 80. The blue and white faience tradition continued in Egypt into Roman times.

³⁵ Watson 2004.

³⁶ Watson 2014; Tite et al 2015.

³⁷ Watson 2004; Watson 2014 and Tite et al 2015.

³⁸ Watson 2004.

³⁹ Wood and Tite 2009.

⁴⁰ Rice 1932. These were surface finds from an ancient rubbish heap outside the town.

⁴¹ Wood et al 2007; Wood and Tite 2009.

⁴² Brill 1999 and Brill 2001.

⁴³ Wood et al 2007; Wood and Tite 2009.

⁴⁴ Cowell and Zhang 2001. See also Kroger 1995, table 2.2. for an analysis of Abbasid blue glass.

⁴⁵ Henderson 2013, p75.

⁴⁶ Wood et al 2007.

⁴⁷ Chen et al 1995 found that high-fired Tang blue and white used a cobalt sulphide mineral, close in composition to linnaeite or cattierite. Ma Wenkuan (1998) notes that the proposed sources for cobalt ores used for Gongxian blue and white are many and various, and include Iran-Afghanistan, Dashi in India, Europe, the Sayan-Tuva and Urals region of Russia, Jingchang in Gansu province and a site in Hebei province.

REFERENCES

- Brill, R., 1999, *Chemical analyses of early glasses: Volume 1 (catalogue) and 2 (tables)*, Corning Museum of Glass, Corning, NY.
- Brill, R., 2001, *Some thoughts on the chemistry and technology of Islamic glass*, *Glass of the Sultans* (eds. S. Carboni and D. Whitehouse), Yale University Press, New Haven and London, 25-40.
- Burgio, L., Clark, R., and Rosser-Owen, M., 2007, Raman analysis of ninth-century Iraqi stuccoes from Samarra, *Journal of Archaeological*

Science 34, 756-762.

Chen Yaocheng, Zhang Fukang, Zhang Xiaowei, Jiang Jongyi and Li Dejin, 1995, A study on Tang blue and white wares and sources of the cobalt pigments used, *Science and Technology of Ancient Ceramics 3 Proceedings of the International Symposium (ISAC '95)* (ed. Guo Jingkun), *Shanghai Research Society of Science and Technology of Ancient Ceramics*, Shanghai, 204-210.

Cowell, M. and Zhang Fukang, 2001, Analyses and source of the cobalt-blue pigments employed on Chinese ceramics, appendix in *Catalogue of late Yuan and Ming ceramics in the British Museum* (J. Harrison-Hall), British Museum Press, London, 601-605.

Flecker, M., 2010, A Ninth-Century Arab or Indian Shipwreck in Indonesia: The First Archaeological Evidence of Direct Trade with China, *Shipwrecked: Tang Treasures and Monsoon Winds*, Smithsonian Institution, Washington, 100-119.

Friedman, F.D. and Borromeo, G., 1998. *Gifts of the Nile: Ancient Egyptian Faience*, Thames & Hudson, London.

Hallett, J., 1999, *Trade and innovation : the rise of a pottery industry in Abbasid Basra*. Unpublished D. Phil thesis, University of Oxford.

Hallett, J. 2010, Pearl Cups Like the Moon: The Abbasid Reception of Chinese Ceramics, *Shipwrecked: Tang Treasures and Monsoon Winds*, Smithsonian Institution, Washington, 74-82.

Henan Provincial Institute of Cultural Relics and Archaeology, China; Cultural Relics Institute of China; Nara National Institute for Cultural Properties, Japan, 2005. *The new archaeological discovery at Huangye kiln site*, Elephant Press, China.

Henderson, J., 2013. *Ancient Glass: An Interdisciplinary Exploration*, Cambridge University Press.

Hsieh Ming-liang, 2010a, The Navigational Route of the Belitung Shipwreck and the Late Tang Ceramic Trade, *Shipwrecked: Tang Treasures and Monsoon Winds*, Smithsonian Institution, Washington, 137-142.

Hsieh Ming-liang, 2010b, White Ware with Green Décor, *Shipwrecked: Tang Treasures and Monsoon Winds*, Smithsonian Institution, Washington, 160-175.

Kroger, J., 1995, *Nishapur : Glass of the Early Islamic Period*. Met-Publications, New York.

Krahl, R., 2010, Chinese Ceramics in the Late Tang Dynasty, *Shipwrecked: Tang Treasures and Monsoon Winds*, Smithsonian Institution, Washington, 45-73.

Li Baoping, 2008, The origins of blue and white: research progress,

latest finds and their significance, *The Oriental Ceramic Society Newsletter*, 16, 9-11.

Li Baoping, Chen Yuh-shiow, and Wood, N., 2010, Chemical Fingerprinting: Tracing the Origins of the Green-Splashed White Ware, *Shipwrecked: Tang Treasures and Monsoon Wind*, Smithsonian Institution, Washington, 176-183.

Li Jiazhi, Zhang Zhigang, Deng Zequn, Chen Shiping, Zhou Xueqin, Yang Wenxian, Zhang Xiangsheng, Wang Yuxi and Chen Ji, 1986, *A study of Gongxian white porcelain of the Sui-Tang period*, in *Scientific and Technological Insights on Ancient Chinese Pottery and Porcelain*, Science Press, Peking, 129-133.

Liu Yang, 2010, Tang Dynasty Changsha Ceramics, *Shipwrecked: Tang Treasures and Monsoon Winds*, Smithsonian Institution, Washington, 144-159.

Ma Wenkuan, 1998, Research on Tang Dynasty Blue-and-White Porcelain and a Discussion of Certain Questions Concerning the Cobalt materials Used in Chinese Blue and White, *China Archaeology and Art Digest*, Vol 11, Numbers 3 and 4, Bruce Gordon Doar and Susan Doar, eds., 7-24.

Medley, M., *The Chinese Potter : A Practical History of Chinese Ceramics*, Phaidon, 1976.

Northedge, A., 2005, *The Historical Topography of Samarra, Samarra Studies I*. British School of Archaeology in Iraq/Fondation Max van Berchem, London.

Northedge, A., & Kennet, D. 1994, The Samarra horizon. In E.J. Grube (ed.) *Cobalt and Lustre. The first centuries of Islamic pottery*. The Nasser D. Khalili Collection of Islamic Art, Vol. IX: Oxford, 21-35.

Priestman, S., 2007, The British Museum Siraf Project, Indian Ocean Trade, Persian Gulf Archaeology, and Indian Ocean Archaeology, *British Institute of Persian Studies Newsletter*, 32, 5-6.

Priestman, S., 2011, Opaque glazed wares: a review of the definition, dating and distribution of a key Iraqi ceramic export in the Abbasid period, *Iran*, 49, 89-114.

QiQi Jiang, 2009. *Tang sancai*. Unpublished D. Phil thesis, University of Oxford.

Rawson, J., Tite, M. and Hughes, M., 1989, The export of *Tang sancai* wares: some recent research, *Transactions of the Oriental Ceramic Society 1987-1988*, 52, 39-61.

Rice, D. T., 1932, The Oxford excavations at Hira – 1931, *Antiquity*, 6, 23, 276-291.

Sarre, F., 1925. *Die Ausgrabungen Von Samarra, Zeiter Band*, Die

Keramik Von Samarra, Berlin.

Tamari, V., 1995, Abbasid blue-on-white ware, *Islamic art in the Ashmolean Museum: Part Two*, (ed. J. Allan), Oxford University Press, Oxford, 117-145.

Tite, M., Watson, O., Pradell, T., Matin, M., Molina, G., Molina, G., Domoney, K., and Bouquillon, A., 2015, Revisiting the beginnings of tin-opacified glazes, *Journal of Archaeological Science*, 57, 80-9.

Vosner, T., 2010, The Jewel of Muscat: Reconstructing a Ninth-Century Sewn-Plank Boat, *Shipwrecked: Tang Treasures and Monsoon Winds*, 120-135.

Watson, O., 2004, *Ceramics from Islamic lands*, Thames and Hudson (in association with The al-Sabah Collection, Dar al-Athar al-Islamiyyah, Kuwait National Museum), London.

Watson, O., 2014, Revisiting Samarra : the rise of Islamic glazed pottery. *Beiträge zur Islamischen Kunst und Archäologie* 4, 125-144.

Whitehouse, D. 1975, The decline of Siraf. In F. Bagherzadeh (ed.)

Proceedings of the 3rd Annual Symposium on Archaeological Research in Iran, 2nd - 7th November, 1974, Muzeh-e Iran-e Bastan, Tehran, 263-70.

Wood, N, Tite, M, Doherty, C. and Gilmour, B., 2007, A technological examination of 9th – 10th century AD Abbasid blue-and-white ware from Iraq, and its comparison with 8th century AD Chinese blue-and-white sancai ware. *Archaeometry* 49, 4, Oxford, 665-684.

Wood, N., & Tite, M., 2009, Blue and White – the Early Years : Tang China and Abbasid Iraq compared. *Percival David Foundation of Chinese Art Colloquy on Transfer in Chinese Ceramics (Trade, Culture, Technology)*. School of Oriental and African Studies, London University, 21-45.

Wood, N., Doherty, C., Rosser-Owen, M., 2009, A Technological Study of Iraqi Imitations of Chinese Changsha Wares and Chinese *Sancai* Wares found at Samarra. *Gu Taoci Kexue Jishu* 8: ISAC '09. Beijing, 154-180.