Chinese Ceramic Trade Withdrawal from the Indian Ocean: Archaeological Evidence from South Iran

Ran Zhang

1. Archaeology Department, Durham University, South Road, Durham, DH13LE, United Kingdom (Email: ran.zhang@durham.ac.uk)

Received: 04 September 2018; Revised: 10 October 2018; Accepted: 21 November 2018

Abstract: With contemporary studies by both historical and archaeological evidence, it was true that, in the early 15th century, the maritime trades and voyages of Zheng He, the admiral of the Ming imperial fleets, to the Indian Ocean have been considered one of the highest peaks of Chinese maritime trade. However, it has been seen that there was a sudden withdrawal of Ming China occurred immediately after this great Imperial expedition, which left a gap with about a couple of generations previously of Vasco da Gama’s voyages. During this gap, no or rare Chinese participation in the Indian Ocean maritime trade had been seen, and it stopped the development of Chinese maritime activities, which had over four hundred years since about the 11th century. This paper aims to review by archaeological evidence from south Iran in a comprehensive pattern of the Ming Gap, and to further re-discuss the Ming Chinese maritime economic withdraw from the Indian Ocean in the early 15th century.

Keywords: Indian Ocean Trade, Ming Gap, Chinese Ceramics, Zheng He, South Iran, Longquan Celadon, Williamson Collection

Introduction
In 1499, rumours from a Florentine merchant suggested that “certain vessels of white Christians” had visited the Calicut port on the Malabar Coast some eighty years before Vasco da Gama’s voyage to India. It was said that these visitors, with large wooden ships, were either Germans or Russians (Ravenstein 1899: 131). However, the Portuguese eventually discovered that the so-called white Christians were, in fact, Chinese (Chaudhuri 1985: 154-55; Digby 1982: 134; Finlay 1992: 225-26; Guy 1986: 39; Jin 2005: 5-6; Yamamoto 1980).

In contemporary studies containing both historical and archaeological evidence, the maritime trade and voyages of Zheng He, the admiral of the Ming imperial fleets, to the Indian Ocean in the early 15th century have been considered as one of the highest peaks of Chinese overseas trade (Dreyer and Stearns 2005; Lin and Zhang 2015). Both imperial-type ceramics and luxuries were traded (Lin and Zhang 2015: 421-27), while many other commodities, such as pepper and sappanwood, were also guarded and monopolised by the imperial expeditions of Ming China (T’ien 1981).
However, a sudden withdrawal of Ming China occurred immediately after this great imperial expedition, which left a gap of a couple of generations previous to Vasco da Gama’s voyages. During this gap, there was little or no Chinese participation in the Indian Ocean maritime trade (Lo 1958: 340-47; Abu-Lughod 1989), which may be one of the reasons for the rumours suggesting that the “white Christians” visitors were Europeans rather than Chinese, given that Chinese maritime activities, which had been established for over four hundred years since the 11th century (Lo 1955; Heng 2005), had recently stopped.

Historically, there are many studies arguing why Ming Chinese maritime sea power withdrew from the Indian Ocean: Abu-Loghod (1989: 346-47) states that the sea route from China to the Indian Ocean was already declining around the mid- and late 14th century. Because of the Black Death, south China had been completely devastated. The official voyages of Zheng He to the Indian Ocean represented the last efforts of Ming China and did not yield the expected results for monopolising the Indian Ocean trade.

Deng Gang (1995) also questions the significance of Zheng He’s voyages and his historical maritime position. Ideologically, the Ming Chinese government had a backward policy relating to Chinese maritime trade, known as ‘no inch of board being allowed to enter the sea (片板不许下海)’. During the era from the 1430s to the 1510s, the debate on the efficacy of private foreign trade had slowed down the development of Chinese sea power. Deng (1995) further argues that Zheng He’s voyages only represented a minor improvement in coordinating a large number of ships and internal division of labour in the voyages, but had no effect on Ming maritime and private foreign trade policy. Atwell (2002), from a world history standpoint, examines the relevance of re-building the history of Ming China and the global ‘Great Depression’ of the mid-15th century. He argues that climatic changes and natural disasters played a negative role in ‘world agriculture and economy’.

In Ming China, for many decades following the 1430s, a series of disasters were documented, including terrible droughts, floods, plagues, and famines, which were distributed across the whole of China (Twitchett and Grimm 1988: 310; Sato 1993: 246-48). Atwell further suggests that extreme weather conditions and disasters, such as drought, flood, and low temperatures had disturbed agriculture on a global scale. The economic difficulties occurred not only in China but also throughout the entire world. This ‘Great Depression’ came to an end after the 1470s. Because of warmer weather after that time, the sharp increases in agricultural and industrial production enabled Ming China, as well as other parts of the world, to experience economic recovery from 1470 to 1535 (Atwell 2002: : 98-103).

Archaeologically, Tom Harrisson suggests the existence of a ‘Ming Gap’, which describes the absence of Chinese ceramics in Sarawak, East Malaysia, dating from the 15th century; instead, ceramics from Southeast Asia are present (Harrisson 1958). A similar pattern may also be seen in Sumatra (Bonatz 2012: 64). Combined with
investigations of shipwrecks in the East Indian Ocean (Brown 2009), there is clearly a shortage of Chinese ceramics dating from the 15th century and early-to-mid 16th century. However, it seems that the archaeological availabilities in terms of Ming Chinese maritime withdrawal in the 15th century have not yet been fully investigated due to a lack of observation from the Western Indian Ocean. This paper therefore aims to provide a new perspective on Chinese ceramic finds from South Iran, with regard to classification and statistical interpretation, in order to discuss the withdrawal of Ming Chinese ceramics in the 15th century.

**Chinese Ceramics from South Iran: the Williamson Collection**

In order to introduce a new archaeological perspective on the ‘Ming Chinese maritime withdrawal’, this research will use the Chinese ceramic finds from the Williamson Collection. Using simple equipment and working on his own, Andrew George Williamson, an archaeologist from the University of Oxford, UK, undertook one of the most extensive and ambitious modern archaeological surveys in the Gulf. Chinese ceramic materials in the Williamson collection were assembled during this programme of excavations and surface surveys of approximately 900 archaeological sites in Southern and Southeastern Iran between September 1968 and April 1971 (Priestman 2005: 1). The collection includes over 19,000 ceramic sherds, around 3,500 of which were imports from the Far East (Priestman and Kennet 2002; Kennet, Ran, and Priestman 2011: 447-49). The untimely death of Williamson in 1975, when he was working in Oman, prevented his research from being completed. A preliminary classification was carried out by Seth Priestman (Priestman 2005: 287-315), with the contribution of Regina Krahl, which is one of the earliest classification frameworks for Chinese trade ceramics in the Western Indian Ocean. As Priestman points out (2005: 128), Chinese materials account for 20% of the Williamson Collection, which is far in excess of the East Asian imports from the coastal sites in the Western Indian Ocean and the Gulf, which range from 0.6 to 3.75%. Mainly based on Priestman’s classification, a further examination of these materials is underway. With the academic and scientific support of the Palace Museum in Beijing, China, it is hoped that a more precisely-dated classification can be achieved.

**A Case Study: the Longquan Celadon and Blue and White Porcelain Sherds from South Iran**

A key challenge in using the 3,500 Far East pottery sherds from the Williamson Collection is the lack of stratigraphies, since most of these sherds come from the surface survey collection. However, Chinese archaeological evidence can support the dating of these Chinese materials and provide a relatively accurate dating result. Based on Priestman’s work (2005: 287-315), some 2,000 pieces have been identified as belonging to the period from the late 13th to the mid-17th centuries (approximately 1370 to 1650), mainly including Longquan celadon, bluish-white porcelain, blue and white porcelain, Cizhou-sgraffiato stoneware, white porcelain, coarse stoneware, and Southeast Asian pottery (Table 1).
Table 1: Sherds and Quantity of Chinese Ceramic finds in the Williamson Collection (Late 13th to Middle 17th Centuries)

<table>
<thead>
<tr>
<th>Classes</th>
<th>Quantity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longquan celadon</td>
<td>976</td>
<td>48.3%</td>
</tr>
<tr>
<td>Chinese blue and white</td>
<td>692</td>
<td>34.3%</td>
</tr>
<tr>
<td>Martabanj jars</td>
<td>140</td>
<td>6.9%</td>
</tr>
<tr>
<td>SE Asian wares</td>
<td>117</td>
<td>5.8%</td>
</tr>
<tr>
<td>South Chinese celadon</td>
<td>49</td>
<td>2.4%</td>
</tr>
<tr>
<td>White porcelain</td>
<td>41</td>
<td>2.0%</td>
</tr>
<tr>
<td>Qingbai ware</td>
<td>2</td>
<td>0.1%</td>
</tr>
<tr>
<td>Cizhou</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Jingdezhen celadon</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2019</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

However, this section aims only to examine the Longquan celadon (LQC) and blue and white porcelain (CBW) sherds as the main evidence for this research. This is because (1) these two classes, in total, represent 1,668 sherds, making up 82.6% of all the collection’s 2,000 sherds, and (2) they can be accurately dated by means of some recently published archaeological evidence from China. Based on a re-examination of these sherds, Figure 1 shows the regrouping of both the Longquan celadon and blue and white porcelain sherds from the Williamson collection, in which they can be divided into four periods.

**Period 1: From about 1270 to 1370 (Yuan Dynasty)**

**Yuan Chinese blue and white porcelain (7 sherds):** There are two types of Chinese blue and white porcelain in the Yuan dynasty: the higher quality type (also called the Zhizheng type: 至正型) and the lower quality type (also called the Yanyou type: 延祐型 or the Philippine type) (Addis 1968) (Figures 1 and 2).

The Zhizheng type has been regarded as the official type or as representing high-class objects, some of which were produced by the Fuliang Ciju (浮梁瓷局 Porcelain Bureau in Fuliang County) for the Yuan central court (Liu 1981). However, the inscriptions on the David vases date to 1351, indicating that they were offering objects rather than for official use. This means that the lower-classes in the Yuan dynasty could also own them. However, there is no doubt that many Zhizheng type products were used for export trading and were exchanged for ‘useful’ goods (Chen 2012). Higher quality blue and white porcelain was fired in local kilns in Jingdezhen, but no individual firing kiln especially for producing Yuan blue and white porcelain has been identified. It appears that many kilns in the Jingdezhen area during the Yuan dynasty were producing similar blue and white porcelain. Zhizheng type wares were fired in kiln sites on the southern bank of the Nanhe River of Hutian (湖田南河), Luoma Qiao (落马桥), and Zhushan (珠山) (cf. Kerr and Wood 2004: 676; JXSWWKGYJS and JDZMYBWG 2007). In comparison with higher quality porcelain objects, the Yanyou type has a smaller size.
and a thinner body. This type’s cobalt blue paintings are freely and quickly painted, and items can be easily distinguished based on the porcelain quality. The Yanyou type has been widely discovered in Southeast Asian, especially in the Philippines. However, they have been also found in significant amounts in India and Iran (Chen 2012).

Figure 1: Principal Shapes and Their Names of Blue and White Porcelain in Yuan Dynasty (Drawn by Ran Zhang)

Figure 2: Sherds of Blue and White Porcelain in Yuan Dynasty, from the Williamson Collection (Photo by Ran Zhang)

Yuan Longquan celadon (739 sherds): Longquan celadon was produced in the kilns of the city of Longquan (龙泉市), and over four hundred individual kilns have been found (Krahl 1986; Qin and Liu 2012). Well-excavated archaeological research from the Dayao kiln sites (大窑窑址), Jincun kiln sites (金村窑址), Xiaomei kiln sites (小梅窑址), and Fengdongyan kiln sites (枫洞岩窑址) provide a good understanding of the
development of Longquan celadon. The celadon that dated roughly to the middle of the Yuan dynasty (the middle of the 14th century) was larger and thicker, as well as being of a slightly lower quality, which is represented by a badly-polished, unglazed footring and a thinner glaze (Figure 3). The larger size is one of the most important features of the Yuan Longquan celadon: a bowl typically has a 20 to 30cm mouth diameter, is about 8 to 15cm high, and has a base diameter of about 8cm, while plates have a mouth diameter of 30 to 40cm, are 5 to 8cm high, and have a base diameter of about 10 to 20cm, although exceptions can be found. Fully decorated and complicated decorations on wares are another important feature. Carved, moulded, and applied decorations are much more common on these wares, and the pattern designs can be clearly seen through the thinner glaze. Table 2 shows the dating evidence of the blue and white porcelain and Longquan celadon, with the dating ranging from 1268 to 1368.

Figure 3: Selected Sherds of Longquan Celadon in Yuan dynasty, from the Williamson Collection (Photo by Ran Zhang)

Figure 4: Selected Sherds of Longquan Celadon in the Early Ming Dynasty, from the Williamson Collection (Photo by Ran Zhan)
## Table 2: Dating Evidence for Chinese Ceramic Finds in Period 1

<table>
<thead>
<tr>
<th>Class</th>
<th>Dating</th>
<th>Evidence</th>
<th>Location</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBW</td>
<td>1314 AD</td>
<td>Tombstone</td>
<td>Jintan, Jiangsu, China</td>
<td>(Xiao 1980)</td>
</tr>
<tr>
<td></td>
<td>1319 AD</td>
<td>Inscription on object</td>
<td>Jiujiang, Jiangxi, China</td>
<td>(Wu 1984; Hu 1981)</td>
</tr>
<tr>
<td></td>
<td>1336 AD</td>
<td>Tombstone</td>
<td>Hangzhou, Zhejiang, China</td>
<td>(Shen 2001)</td>
</tr>
<tr>
<td></td>
<td>1338 AD</td>
<td>Tombstone</td>
<td>Fengcheng, Jiangxi, China</td>
<td>(Yang and Wan 1981)</td>
</tr>
<tr>
<td></td>
<td>1348 AD</td>
<td>Tombstone</td>
<td>Jiangxi, China</td>
<td>(Huang and Zhen 1988: Plate 3)</td>
</tr>
<tr>
<td></td>
<td>1351 AD</td>
<td>Inscription on object</td>
<td>PDF Collection, London, UK</td>
<td>(Harrison-Hall and Krah 2009: 52-53)</td>
</tr>
<tr>
<td></td>
<td>1351 AD</td>
<td>Tombstone</td>
<td>Jiujiang, Jiangxi, China</td>
<td>(Wu 1992)</td>
</tr>
<tr>
<td></td>
<td>1352-1361 AD</td>
<td>Burial objects</td>
<td>Ili, Xinjiang, China</td>
<td>(XJBWG 1979)</td>
</tr>
<tr>
<td></td>
<td>1268 AD</td>
<td>Tombstone</td>
<td>Deqing, Zhejiang</td>
<td>(Zhu 1998: 154)</td>
</tr>
<tr>
<td></td>
<td>1274 AD</td>
<td>Tombstone</td>
<td>Qzhou, Zhejiang</td>
<td>(QZSWGH 1983)</td>
</tr>
<tr>
<td></td>
<td>1275 AD</td>
<td>Tombstone</td>
<td>Lishui, Zhejiang</td>
<td>(ZJBWG 2000)</td>
</tr>
<tr>
<td></td>
<td>1302 AD</td>
<td>Tombstone</td>
<td>Hangzhou, Zhejiang</td>
<td>(Zhu 1998: 200)</td>
</tr>
<tr>
<td>LQC</td>
<td>1313 AD</td>
<td>Tombstone</td>
<td>Beijing</td>
<td>(BJSWWYJS 1986)</td>
</tr>
<tr>
<td></td>
<td>1320 AD</td>
<td>Tombstone</td>
<td>Xuzhou, Jiangsu</td>
<td>(Qiu and Xu 1993)</td>
</tr>
<tr>
<td></td>
<td>1338-1353 AD</td>
<td>Tombstone</td>
<td>Shanghai, China</td>
<td>(SHBWG 1982: 53)</td>
</tr>
<tr>
<td></td>
<td>1345 AD</td>
<td>Tombstone</td>
<td>Yicheng, Hubei, China</td>
<td>(Zhang 1996)</td>
</tr>
<tr>
<td></td>
<td>1351-1361 AD</td>
<td>Cellar burial objects</td>
<td>Gao’an, Jiangxi, China</td>
<td>(Liu and Xiong 1982)</td>
</tr>
<tr>
<td></td>
<td>1352 AD</td>
<td>Shipwreck objects</td>
<td>Cixian, Hebei, China</td>
<td>(Kim 2012)</td>
</tr>
<tr>
<td></td>
<td>1353 AD</td>
<td>Tombstone</td>
<td>Zhangshu, Jiangxi, China</td>
<td>(Huang 1996)</td>
</tr>
<tr>
<td></td>
<td>1358-1368 AD</td>
<td>Tombstone</td>
<td>Inner Mongolia</td>
<td>(Wang 2004)</td>
</tr>
</tbody>
</table>

### Period 2: From about 1370 to 1430 (Early Ming Dynasty)

**Early Ming Longquan celadon (112 sherds):** During the era from about 1370 to 1430, Longquan celadon can also be divided into a group of high quality Longquan celadon and a lower quality group. The higher quality group includes imperial celadon products from the Dayao Fengdongyan kiln site, which can be precisely dated to the Yongle period (1403-1424) (Figure 4). The higher quality Longquan celadon wares in this period have a very thick glaze (1 to 2mm) in bean green or light green. The colour...
of the glaze has been very well controlled, and only rarely are yellowish green, dark green, and brownish green seen. The glaze quality is high, as good as jade, and crackles are rarely present. The greyish-white body is heavy, pure, and smooth, with no visible inclusions. Inside the foot, an unglazed ring can be seen. Although unglazed rings began in the middle of the Yuan dynasty, they are rare in this period, while unglazed rings are common during the early Ming dynasty. Imperial celadon has a well-made ring, which is clear and neat.

A kiln tool (mould) from the Dayao Fengdongyan imperial kiln site has a carved inscription dating from the ninth year of the Yongle reign (1411), and this is where high quality imperial Longquan celadon wares have been discovered (Xu, 2009: 11). The lower quality celadon can be dated to the early Ming dynasty (between 1387 and 1418) based on tomb site excavations in China. Four tomb sites have been found in present-day Nanjing City in Jiangsu Province, which was the capital during the early period of the Ming dynasty (the Ming capital moved to Beijing after 1412). The Xue Xian tomb, which dates to 1387 (based on an inscription on the tombstone), yielded a celadon bowl with a similar shape, body, and glaze to the bowls in subclass LQC IV-2. The inscription reads ‘Hong Wu Er Shi Nian’ (洪武二十年: the twentieth year of the Hong Wu reign) (NJSBWG 2005). The Zhang Yun tomb yielded a set of Longquan celadon, consisting of bowls, cups, and vases, as well as a tombstone that can be dated to 1395 based on the inscription ‘Hong Wu Er Shi Ba Nian’ (洪武十八年: the twenty-eighth year of the Hong Wu reign) (NJSBWG 2005). The Song Sheng tomb dates to 1407 based on the tombstone inscription ‘Yong Le Wu Nian’ (永乐五年: the fifth year of the Yongle reign), yielding a set of bowls, plates, and flower pots (Li 1962). The Ye Shi tomb, whose owner was Song Sheng’s wife, can be dated to 1418 based on the inscription ‘Yong Le Shi Liu Nian’ (永乐十六年: the sixteenth year of the Yongle reign), yielding a set of celadon plates and vases (Li 1962).

**Period 3: From about 1430 to 1550 (Middle Ming Dynasty)**

**Middle Ming blue and white porcelain (295 sherds):** This is a group of blue and white porcelain made in the Jingdezhen kilns, which can be dated to the middle Ming period (approximately late 15th to mid-16th centuries) (Figures 5 and 6). However, it should be noted that the definitions of blue and white porcelain from the middle of the Ming period are many and unclear. Based on an understanding of the Chinese ceramic collection kept in Topkapi Museum, which includes blue and white porcelain, monochrome porcelain, and polychrome porcelain, Regina KrahI states that Chinese porcelain from the middle of the Ming dynasty roughly covers the period from the late Xuande reign (1426-1435) to the Jiajing period (1521-1567), including the ‘interregnum’ period (1436-1464) (KrahI 1986: 529). A similar division has defined this period more precisely from 1433 to 1554, according to Chinese historical events (Liu 2005: 16-17). Lv Chenglong, in his lecture in 2008, voices a different opinion, and defines the blue and white porcelain of the middle Ming period as starting in the Chenghua period and ending in the Zhengde reign (1464 to 1521). His argument is mainly based on the changing cobalt ore applied to the porcelain, which gives a different colour to the blue
and white porcelain and can be distinguished from earlier and later periods (Lv 2008). The body and glaze of the middle Ming blue and white porcelain are more dense and pure, but this change is slight, and sometimes the body and glaze may look the same as the blue and white porcelain of the Yuan and early Ming period. The body is much thinner than in previous periods, with the thickness of bowls and plates normally about 1cm and rarely any thicker than 1.5cm. The glaze is usually slightly bluish-white, or the whiteness of an egg white.

![Figure 5: Principal Shapes and Their Names of Blue and White Porcelain in Middle Ming Dynasty (Drawn by Ran Zhang)](image)

Figure 5: Principal Shapes and Their Names of Blue and White Porcelain in Middle Ming Dynasty (Drawn by Ran Zhang)

![Figure 6: Selected Sherds of Blue and White Porcelain in Middle Ming Dynasty, from the Williamson Collection (Photo by Ran Zhang)](image)

Figure 6: Selected Sherds of Blue and White Porcelain in Middle Ming Dynasty, from the Williamson Collection (Photo by Ran Zhang)

With regard to size, bowls and plates are normally medium to large, with the mouth diameter of medium-sized bowls/plates being no larger than 20cm/30cm (BJSWWYJJS 2007) and about 30cm/50cm (Krahl 1986) for larger sizes. Bowls and plates normally
have an in-turned footring, which sometime is of the ‘Wazu Guojian (挖足过肩)’ type, a typical footring of the middle Ming dynasty (Liu and Bai 1980). The shape of the bowls and plates vary; in this sense, a wide rim, floral rim, straight body, and round body can all be found (BJSWWYJS 2007).

From the end of the 16th century until the 20th century, there was no historical mention of cobalt ore imports, which may relate to Chinese native cobalt ore having been extensively and successfully mined at that time (Kerr and Wood 2004: 684-685). The Chinese cobalt ore named ‘Po Tang Qing’ (陂塘青) or ‘Ping Deng Qing’ (平等青) results in a much lighter blue colour, adding a bit of grey to the blue and white porcelain. In the middle and late Ming dynasty, this cobalt ore was gradually substituted by another blue called ‘Shi Zi Qing’ (石子青), which results in an even greyer shade of blue. Patterns in this group were freely and quickly painted, and motifs of the Buddhist Vajra, a lion playing with brocaded balls, floral scrolls, lotus, and stylised flowers are all common. Almost all the paintings are diffused and the strokes are thick. The bowls and plates normally have a fully decorated pattern on both the inside and outside surfaces, and blank spaces are rare. This style has been described as ‘horror vacui’ (fear of empty spaces), also occurring on Yuan blue and white porcelain. In this group, the naturalism of the motifs is lost and they are fully stylised (Krahl 1986: 533). For example, floral scrolls may have an intermittent stalk, with the blank space fully filled with small flowers and leaves. The ‘horror vacui’ effect was also applied to low quality bowls made in Jingdezhen, which were decorated with dots (Priestman 2005: 311; JXSWWKGYJS and JDZMYBWG 2007: 354, 462-64).
Middle Ming Longquan celadon (125 sherds): During this period, Longquan celadon wares were normally of low quality (Figure 7). This group can be dated to around the middle of the 15th century, the evidence for which comes from two tombs: the Ge Shi Tomb, which can be dated to 1441 based on the inscription ‘Zheng Tong Liu Nian’ (正统六年, the sixth year of the Zhengtong reign), yielded two vases, and the Wei Yuan Tomb, which can be dated to 1444 based on the inscription ‘Zheng Tong Jiu Nian’ (正统九年, the ninth year of the Zhengtong reign), which produced a group of celadon plates and vases (Zhu 1998: 272-84). This group usually has a glass-like, thin, green glaze. Normally, the glaze has been applied three times, and there is some variation in the green, such as dark green, brownish green, olive green, and yellowish green. The body is loose, and black inclusions can be seen by the naked eye. The body is white, very thick, and heavy, and it is normally thicker than 1-2cm. Wares with a pure, good quality and a white body are also seen.

Period 4: From about 1550 to 1650 (Late Ming Dynasty)

Late Ming blue and white porcelain (390 sherds): Three main features can be seen on the Jingdezhen blue and white porcelain made in the late Ming dynasty: first, the colour of cobalt blue has changed from being greyish and light blue in the middle Ming period to purplish blue; second, the painting stroke has become thinner, and the patterns on the porcelain have a thin-stroked outline and are then filled with a slightly lighter purplish blue; and third, the body of wares are even more thinner than the last class. However, the porcelain wares have been formed quickly, with less refined work. The late Ming blue and white porcelain can be roughly dated from the mid-16th century to the mid-17th century.

The late Ming blue and white porcelain represents wares that have a distinct purplish and bright cobalt blue, a colour given by Hui Qing (回青, a kind of imported cobalt ore). This ore was introduced into China during the Jiajing reign, and no later than the middle of the 16th century, which has been discussed in previous paragraphs. In approximately the thirtieth year of the Wanli reign (1602), the best-quality blue called Zhe Liao (浙料, the cobalt ore mined in Zhejiang Province) was used for painting porcelain. Zhe Lian then became so popular in painting blue and white porcelain that it was commonly used until the Qing dynasty. According to the change of cobalt ore and colour, this group can be dated from the late 16th century to the early 17th century.

In many cases, the inside area of the footring has the marks of spanning lines or the so-called “Tiao Dao Mark (跳刀痕)”, which is a glazed chatter-mark caused by the footring being formed and polished with unstable knife-cutting when the ware was quickly spanning on the wheel. Sometimes, grit from the kiln floor stuck to the footring, called “Zhan Sha (粘沙)”, which commonly occurred on lower quality ceramics and imitation blue and white porcelain from Zhangzhou kilns.

The late Ming blue and white porcelain also includes the so-called ‘Kraak’ porcelain, the name for which comes from a story: these kinds of blue and white porcelain wares
were found in the cargoes of Portuguese merchant ships that, in Dutch, were called “Kraken (carracks)”, as these ships had been captured in the 17th century by sailors from Holland and Zeeland (Van Der Pijl-Ketel 1982: 46). Of course, there are many other versions that explain ‘Kraak’ (Xiong 2006: 113-14), and therefore the problem is that there is no standardised understanding of Kraak porcelain, not only in relation to its name but also its descriptions and dating.

At the present time, only one thing has been confirmed: Kraak porcelain is regarded as a kind of exported ceramic in the late Ming period. Before Kraak porcelain, there was no clear border between domestically-used porcelain and exported porcelain (Pei 1999: 80-81). The reason for this is that Kraak porcelain has rarely been found inside of China and has only been found at kiln sites. In addition, it has only been located in two tombs in Jiangxi Province (Pei 1999: 80-81). According to current studies on Kraak porcelain, its exact definition is unknown; in this sense, its origin, dating, and description are all in debate.

![Figure 8: Distribution of Chinese Ceramic Finds from the Williamson Collection (from Late 13th to Middle 17th Centuries)](image)

**Observations: Distributions and Changes of Chinese Ceramics in South Iran**

The maps in Figure 8 show all the Chinese ceramic imports in South Iran from the late 13th century to the mid-17th century. The second half of the 13th century witnessed a dramatic expansion of the Mongol Empire, and this period has attracted a great deal of attention from historians and archaeologists. Abu-Lughod (1989) believes that this was an early stage in the globalisation process prior to that created and recorded by European merchants. Under the rule of the Mongol Empire, the Golden Horde, Chagatai, Ögedei, Ilkhanate, and Yuan China occupied most of the Islamic-Asian
continent and, through their conquests and re-connections, trade by land or sea-based routes began to re-emerge in the 13th to 14th centuries (Lin 2006; Liu 2010: 109; Lin 2011). At this time, in South Iran, it can be seen that the Chinese ceramic trade was thriving, with Chinese ceramic sherds mostly being concentrated in the areas of Minab, Hormuz, and Kish Island. In a wider pattern, Chinese ceramic sherds were traded to the hinterland of South Iran and beyond the Bushehr Peninsula.

Table 3: Number and Percentages of Celadon and Blue and White Wares Imported to Western Indian Ocean, from the 8th to 17th Centuries (Zhang 2016: 295-96)

<table>
<thead>
<tr>
<th>Class</th>
<th>Value</th>
<th>8th to 10th cent.</th>
<th>11th to 13th cent.</th>
<th>14th cent.</th>
<th>15th cent.</th>
<th>16th to 17th cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. (Total No.)</td>
<td>650 (3,479)</td>
<td>1,178 (2,487)</td>
<td>7,140 (9,552)</td>
<td>933 (1,089)</td>
<td>6 (4,782)</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>18.7</td>
<td>47.4</td>
<td>74.7</td>
<td>85.7</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>No. (Total No.)</td>
<td>1 (3,479)</td>
<td>0 (2,487)</td>
<td>645 (9,552)</td>
<td>150 (1,089)</td>
<td>4,565 (4,782)</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>0</td>
<td>0</td>
<td>6.8</td>
<td>13.8</td>
<td>95.4</td>
<td></td>
</tr>
</tbody>
</table>

Figure 9: Number of Celadon (LQC) and Blue and White Wares (CBW) Imported to South Iran from the 13th to 17th Centuries

However, there was a great decline in the trade of Chinese ceramics from 1370 to 1430, as the Ming central court attempted to monopolise both private and official trade activities. This occurred just after a short ‘sea ban’ during the reign of Emperor Hongwu (Tien 1981). It should be noted that a general trade pattern relating to Chinese ceramics in the Western Indian Ocean is problematic, as the official monopoly and private sea ban resulted in a rarity of archaeological materials, in addition to poor identification of Chinese ceramics from this period. During Zheng He’s voyages to the
Western Indian Ocean (lasting about 20 years from 1413 to 1433) (Chao 2012: 101-Figure 2), common quality Chinese ceramics did not yield clear chronological and typological changes (e.g. see dating results with ‘Late Yuan to Early Ming Period’ of Chinese ceramic finds, data from Liu, Qin, and Kiriama 2012: 47-49). In South Iran, although the areas of Minab, Hormuz Island, and Kish Island have all yielded Chinese ceramic sherds, the quantity declined sharply. Chinese ceramic sherds can still be found along the littoral area in South Iran, but not in the hinterland.

Interestingly, from 1430, the end of Zheng He’s voyages, to 1566, the re-opening of Chinese private trade, Chinese ceramic trade would be expected to have faced a significant lull due to the maritime withdrawal of Ming China from the Indian Ocean. However, it can be seen from the Williamson Collection that Chinese ceramics can be widely found in both the costal and mainland areas of South Iran. Chinese ceramic finds were mainly distributed from Minab to Kish Island. In this sense, it seems that not only was Chinese ceramic trade not stopped, but it greatly increased.

In 1566, the death of Emperor Jiajing marked the end of the Ming sea ban. In the following year, as suggested by the Fujian provincial governor (grand coordinator), Tu Zeming (涂泽民), Emperor Longqing revoked the ban on coastal foreign trade (excluding Japan) (Chen Zilong 1962: Vol. 400). However, this re-opening of China was very limited, as the only port opened was the Yuegang port (月港), near Zhangzhou, and only merchants from Zhangzhou and Quanzhou in the southern province of Fujian were allowed to trade (Chao 2012: 217-21). Although this open policy was continued by later Ming emperors, short-term closures of the Yuegang port also occurred (Chao 2012: 220-21). Regardless of the limitations in re-opening Ming China during the reign of Emperor Longqing, the long-term sea trade ban from the late 14th century was essentially reversed. In South Iran, the trade pattern did not change much in comparison to the previous period.

**Discussion and Limitations**

**Chinese celadon vs. blue and white porcelain:** Derek Kennet first made the observation regarding the replacement of Longquan celadon by blue and white porcelain in the Gulf. In the sites of Kush and al-Mataf in Ras al-Khaimah, UAE, Chinese blue and white porcelain were not imported in great quantities until later in the 16th century (Kennet 2004: 103). Kennet also points out a similar pattern occurring in Shanga and Kilwa, and no Chinese blue and white porcelain has been found during the early 15th century (Horton, Brown, and Mudida 1996: 310, table 14; Chittick and Wheeler 1974: 18, 312; Kennet 2004: 103).

In a more general pattern, and over a longer period in the Western Indian Ocean Chinese ceramic trade (Table 3), one can see the much higher proportion of celadon wares among all Chinese trade ceramics; in this sense, their numbers grew steadily from the 8th to the 15th centuries (from 18.7% in the 8th century to 85.7% in the 15th century), with a sharp increase in sherd numbers in the 14th century (from 1,178 in the
11\textsuperscript{th} century to 7,140 in the 13\textsuperscript{th} centuries), and then there was a numerical trough in sherd numbers in the 15\textsuperscript{th} century. Conversely, large quantities of traded blue and white porcelain were not seen before the 16\textsuperscript{th} century (Zhang 2016: 295-96).

Based on the aforementioned observations, it can also be seen that, from Period 3 (1430-1550), there was the a significant change in Chinese ceramic trade: a sharp decline of celadon can be clearly seen, from more than 90% in Period 1 to 29.7% in Period 3 (quantities also dropped sharply from 739 pieces to 125 pieces). However, Chinese blue and white porcelain represented a very small amount in Period 1 (about 1%), and there was not a single sherd in Period 2. During Periods 3 and 4, this dramatically and suddenly increased to 70%, eventually reaching 91.1% (Figure 9).

It has been argued that the period of successful manufacturing of blue and white porcelain in China was in the middle of the 14\textsuperscript{th} century (Li 1998: 370-71; cf. Kerr and Wood 2004: 219; Feng 2009: 452-56), and, for the export market, it is believed that the Chinese blue and white porcelain started to dominate the Chinese export market after 1368, when the Ming dynasty was established (Guy 1986: 25). However, during the period from the mid-14\textsuperscript{th} to mid-15\textsuperscript{th} centuries, celadon wares were still the major part of the Chinese ceramics traded in the Western Indian Ocean and the Gulf.

**Figure 10: Selected Sherds of Thai Celadon in the 15\textsuperscript{th} Century, from the Williamson Collection (Photo by Ran Zhang)**

**Southeast Asian Pottery:** Among all the Far East pottery from the Williamson Collection, 117 sherds have been identified as Southeast Asian wares (Priestman 2005: 301-03, 15). Only three Vietnamese blue and white porcelain sherds (VBW.1) have been dated to the 14\textsuperscript{th} century (Priestman 2005: 315), and other grey stoneware (STO) and celadon sherds (examined by the author) have been dated roughly to the period from the 15\textsuperscript{th} to the 17\textsuperscript{th} centuries (Priestman 2005: 301-03) (Figure 10). These sherds therefore provide an interesting observation that, during the period in which Chinese ceramic imports experienced a trough in the 15\textsuperscript{th} century, Southeast Asian wares experienced a
certain increase, suggested that they filled the gap resulting from the shortage of Chinese ceramic imports during Periods 2 and 3.

**The true ‘gap’ in South Iran relating to Chinese ceramic trade:** Roxanna Brown offers a comparison of data from the shipwreck sites in Southeast Asia. She points out that there was a significant drop, from almost 100% to 40%, of Chinese ceramic products in the cargos of the Eastern Indian Ocean shipwrecks that occurred from 1368 to 1424/1430; then, there was a further drop to five percent or even less in the years from 1424/1430 to 1487. In this sense, there was a long gap in the trade of Chinese blue and white porcelain products from 1352 to 1487 (Brown 2009: 69-70).

A quite similar pattern in South Iran has been set out by the Williamson Collection. In this regard, a significant trough can be seen in the period from 1368 to 1430, particularly for Longquan celadon wares. Based on observations of the Williamson Collection, very small quantities of Chinese blue and white porcelain were being traded in the period of the Yuan dynasty, while it was totally absent in the early Ming period (Period 2). Interestingly, however, a further drop cannot be seen in Period 3. In particular, Longquan celadon wares that can be dated to around the middle of the 15th century were still in trade to a certain degree. For the blue and white porcelain sherds from the Williamson Collection in Period 3, they have generally been dated to after 1500, or the reign of the Ming emperor Zhengde (1505 to 1521). An imperial quality sherd can be dated precisely to this period. After this, blue and white porcelain wares experienced an increase in numbers during Period 4. It may be fair to suggest that Period 2 witnessed a great depression of Chinese ceramic trade in South Iran, mainly due to the ‘sea ban’ policy of Ming China, but Chinese ceramic have been trade without a clear gap. Furthermore, although it looks as if there was an increasing number of Chinese ceramic imports in Period 3, a significant gap was probably occurring during this era, from about the mid- to late 15th century. During this gap, the Longquan celadon trade came to an end and Chinese blue and white porcelain gradually started to dominate from the 16th century onwards.

**Conclusion and Further Perspectives**

This paper initially discussed the Chinese ceramic materials in the Williamson Collection that were uncovered from South Iran during the period from the late 13th to the mid-17th centuries, in terms of the lack of trade in Chinese ceramics in the Indian Ocean. It can be seen that, firstly, from 1368 to 1430, there was a clear trough in relation to Chinese ceramic trade. This sharp decline may have been caused by the ‘sea ban’ policy in the early Ming dynasty. As Deng argues, although Zheng He’s voyages to the Indian Ocean marked one of the most ambitious displays of Chinese maritime power, they did not result in even minor improvements of trade between Ming China and the Indian Ocean. In fact, this period represented a step backward in comparison with trade patterns in the Song and Yuan period (approximately from the 11th to the 14th centuries) (Deng 1995: 19). The Chinese ceramic materials from South Iran can therefore be understood as an archaeological echo.
Second, as mentioned above, the general historical pattern shows that a global ‘Great Depression’ was occurring in the mid-15th century (Atwell 2002). Intensive droughts, floods, plagues and famines terrorised China for many decades after the 1430s (Twitchett and Grimm 1988: 310; Sato 1993: 246-48). The manufacturing industries in South China were in steep decline until the late 15th century, when they gradually recovered (Atwell 2002). Based on the observation of Chinese ceramic finds from South Iran, it can be seen that the Chinese ceramic trade experienced a gap in the middle of the 15th century, during the period of the global ‘Great Depression’. This was also the period experiencing a shift of Chinese ceramic trade from celadon wares to blue and white porcelain.

It should be noted that the Williamson Collection has clear limitations because it is a collection by surface survey rather than archaeological excavation. Therefore, the dating of Chinese ceramic materials in this collection generally has to be based on a naked-eye examination, which may cause problems in distinguishing the original manufacturing kilns and identifying coarse quality ceramic sherds. The next step of this research aims to introduce scientific tests for Chinese ceramic sherds and provide an accurate pattern for dating and identification outcomes.

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