Blue-and-white porcelain: cross-cultural exchange and design innovation between China and Europe

Cogent Arts & Humanities

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/oaah20

Blue-and-white porcelain: cross-cultural exchange and design innovation between China and Europe

Meizi Gu, Anita Fang Chen & Rita Almeida Filipe

To cite this article: Meizi Gu, Anita Fang Chen & Rita Almeida Filipe (2025) Blue-and-white porcelain: cross-cultural exchange and design innovation between China and Europe, Cogent Arts & Humanities, 12:1, 2483584, DOI: 10.1080/23311983.2025.2483584

To link to this article: https://doi.org/10.1080/23311983.2025.2483584

COGENT ARTS & HUMANITIES
2025, VOL. 12, NO. 1, 2483584
https://doi.org/10.1080/23311983.2025.2483584

VISUAL & PERFORMING ARTS | RESEARCH ARTICLE

OPEN ACCESS Check for updates

Blue-and-white porcelain: cross-cultural exchange and design innovation between China and Europe

Meizi Gu[a], Anita Fang Chen[b] and Rita Almeida Filipe[a]

[a]Department of Design, Lisbon School of Architecture, University of Lisbon, Lisbon, Portugal; [b]Department of Interaction Design, Chalmers University of Technology, Gothenburg, Sweden

ABSTRACT

This study investigates the evolution of blue-and-white porcelain (BWP) as a vital medium of cultural exchange between China and Europe, focusing on its adaptation in Islamic regions, Portugal, and the Netherlands. Through an interdisciplinary approach that integrates art history, cultural theory, and material studies, the research examines the enduring influence of BWP on design aesthetics and practices over centuries. The study traces the historical development of BWP, underscoring its role in blending Eastern and Western design principles and its continued relevance as a source of inspiration for contemporary design. By framing BWP as more than a historical artefact, this research positions it as a lasting symbol of global cultural dialogue, capable of ongoing reinterpretation within modern design contexts.

ARTICLE HISTORY
Received 19 March 2024
Revised 28 January 2025
Accepted 19 March 2025

KEYWORDS
Blue-and-white porcelain; cross-cultural exchange; design aesthetics; cultural dialogue; cultural hybridity

SUBJECTS
Asian Studies; Visual Communication; Sustainable Development; Culture & Development; Visual Arts; Art & Visual Culture; Design; History; Cultural Studies

Introduction

In an era of increasing cultural convergence, this research investigates the intricate and enduring dialogue between Chinese and European design, focusing on BWP as a central case study. As an art form with a history spanning over a millennium, BWP has long served as a pivotal medium for cross-cultural exchange.

Historically, BWP transitioned from an exotic Eastern luxury to a deeply embedded element of European artistic and cultural traditions. Its unique aesthetic profoundly influenced European design, enriching its visual language and shaping artistic sensibilities across time. S Extensive scholarship has documented BWP's integration into European art, demonstrating its role as both a catalyst and a reflection of the complex interplay between Eastern and Western influences. These exchanges have played a crucial role in shaping design and aesthetic trends, reflecting broader processes of cultural exchange and artistic hybridity.

Despite this rich historiography, a critical gap persists in applying the historical narrative of BWP to inform contemporary and future design innovation. Present-day adaptations often oscillate between nostalgic homage and direct replication, revealing a missed opportunity to translate the intricate dynamics of historical cultural exchanges into frameworks that inspire new creative practices. Addressing this gap, the study poses the central research question:

> "*How can the historical narrative of blue-and-white design be leveraged to inspire and enrich its contemporary and future applications*?"

To explore this, the research first re-examines key historical developments of BWP through a contemporary lens, focusing on geographic, material, and trade contexts and collecting practices that influenced its diffusion and adaptation in Europe. This analysis sheds new light on the processes of cultural dialogue

CONTACT Meizi Gu lovinmeizi@gmail.com; meizigu@edu.ulisboa.pt Department of Design, Lisbon School of Architecture, University of Lisbon, 1349-063 Lisbon, Portugal

between China and Europe and uncovers how BWP evolved as both a material and conceptual artefact. Building on these insights, the study proposes innovative approaches for integrating blue-and-white elements into contemporary design while fostering creativity that transcends mimicry—ensuring the enduring relevance of this historical art form in modern and future design contexts.

Study methodology

This research employs an interdisciplinary methodology, combining art history, archaeology, and material science with cultural theory to explore BWP. Data collection is grounded in an extensive literature review, encompassing historical analyses, cultural studies, and design theory, complemented by a focused examination of museum artifacts.

Homi Bhabha's theory of hybridity serves as the primary theoretical framework, enabling a nuanced analysis of cross-cultural exchanges between China and Europe. This approach allows the study to contextualise BWP as a medium of cultural interaction and artistic innovation, revealing the complexities of its integration into divergent artistic traditions.

The research is conducted in two phases. The first phase traces the historical development of BWP, emphasising key moments of cultural exchange and transformation that shaped its evolution. The second phase explores the contemporary relevance of blue-and-white design principles, projecting how its core aesthetic and symbolic elements can inform modern and future design practices. By combining historical inquiry with forward-looking design applications, this methodology provides a comprehensive and dynamic perspective on BWP's lasting global influence.

Through this integrated approach, the study directly addresses the research question, offering a framework for understanding both the historical significance and the ongoing potential of BWP within global design discourse.

Historical context and evolution of BWP

Phase 1

BWP holds a significant place in Chinese ceramics and global design history. Its origins date back to the Tang dynasty (618–907 CE), achieving artistic refinement during the Yuan (1279–1368 CE) and Ming (1368–1644 CE) dynasties. Defined by its striking blue patterns on a pristine white porcelain base, BWP owes its iconic appearance to using cobalt oxide as a pigment. Dynamic trade networks and cultural and technological exchanges between China and the Middle East shaped the evolution of this porcelain. These early interactions established BWP as a lasting symbol of cross-cultural influence and innovation.

The following timeline presents key milestones in the historical development of BWP. It traced its journey from its origins during the Tang dynasty through its periods of decline, culminating in its revival and flourishing during the Yuan dynasty. This summary offers a clear and concise overview of the porcelain's formative stages.

Time period	Event/development	Description	Impact
Late Tang Dynasty (circa 618–907 CE)	Perfection of translucent white porcelain in northern China	The production technology for translucent white porcelain reached its pinnacle during the late Tang dynasty, as demonstrated by white porcelain fragments excavated from the Huangye and Baihe kilns. This achievement was primarily driven by advancements in high-temperature kiln techniques, allowing firing temperatures to exceed 1250 °C (Li et al., 2017).	Persian observers praised Chinese craftsmanship as "unparalleled" (Ahmed, 2021). Chinese white porcelain gained widespread global acclaim and became a fundamental element of ceramic art traditions worldwide.
Late Tang Dynasty (Late 618–907 CE)	China's Openness and Its Impact on Sino-Persian Trade Relations	China's era of openness, marked by extensive international trade and active cultural exchanges, resulted in significant interactions and formal diplomatic ties with Persia (Xiong, 1990). The growing presence of Persian and Islamic traders within China facilitated a dynamic exchange of goods and technologies, including the introduction of cobalt oxide, a key ingredient for blue glaze (Zhang & Cowell, 1989).	Persian merchants' introduction of cobalt blue glaze played a pivotal role in the early development of BWP. This cross-cultural exchange advanced Chinese ceramic techniques and laid the foundation for one of the most significant artistic and economic phenomena in global ceramic history.

Time period	Event/development	Description	Impact
8th Century CE	The influence of Persian cobalt on Chinese BWP production expands in the Yuan dynasty.	In the 8th century, cobalt blue glazing became prominent in Islamic pottery, and concurrently, Chinese white porcelain began to adopt cobalt blue glaze (Wen, 2012). According to Kaczmarczyk and Hedges (1983), the Kashan region in Persia was a key source of cobalt until the late Middle Ages.	The introduction of cobalt blue glaze facilitated the emergence of BWP and played a vital role in the cultural integration between China and Persia.
Circa 830 CE°	Batu Hitam Shipwreck and the Early Export Specimens of BWP	The Batu Hitam shipwreck, discovered in 1998 off the coast of Belitung Island, sank around 830 CE. It contained over 67,000 ceramic items, predominantly Chinese artifacts intended for the Persian Gulf. Among these were three intact BWP plates (Figures 1–3), considered some of the earliest known examples (Hsieh, 2002; Qi, 2017).	This shipwreck provided vital evidence for the study of early BWP, highlighting both the demand for Chinese ceramics in Middle Eastern markets and their influence on global ceramic trade patterns.
Late Tang Dynasty (907 CE)	The decline in BWP production	After the fall of the Tang Dynasty, the closure of the Huangye kiln marked a sharp decline in the production of BWP. Archaeological evidence indicates that BWP failed to achieve widespread adoption during this period. Instead, it entered a prolonged phase of stagnation, with production reaching its lowest levels (Li et al., 2017).	The shutdown of the Huangye kiln directly disrupted BWP production, significantly affecting the trajectory of the ceramics industry during this era.
Song Dynasty (960–1279 CE)	The Transformation of Chinese Aesthetics: Celadon and Monochrome Glazes	During the Song Dynasty, aesthetic preferences shifted towards the use of monochrome glazes and intricate carving techniques, with a particular emphasis on celadon ware. This transition marked a movement away from the vibrant and diverse aesthetic expressions of the Tang Dynasty towards a more restrained and refined sophistication that characterised Song Dynasty culture (Fu, 1977).	The Song Dynasty's emphasis on ceramic aesthetics, notably monochrome glazes and celadon ware, resulted in a significant decline in the production and prominence of BWP. The focus shifted from bold and vivid designs to more subdued and naturalistic forms, reflecting the evolving artistic sensibilities of the time.
Yuan Dynasty (1271 CE)	The revival of BWP, driven by Kublai Khan's conquests and expanded trade	Kublai Khan, founder of the Yuan Dynasty, extended his empire to Persia and Central Asia. The expansion of Silk Road trade routes facilitated the reintroduction of Persian cobalt pigment—a key material for BWP production. Furthermore, blending Mongol-Islamic aesthetics with shared demands for trade goods stimulated domestic and international markets for BWP (Chaffee, 2013; Xu, 2012).	The revival of BWP during the Yuan Dynasty provided a foundation for its enduring significance in Chinese ceramics. Enhanced trade routes and access to Persian cobalt pigment positioned BWP as a major export commodity, profoundly influencing global ceramics and ensuring its widespread demand for centuries.

The Tang Dynasty shipwreck *Batu Hitam*, which sailed from China to the Middle East around 830 AD, was salvaged near Belitung, Indonesia, between 1998 and 1999. Among the numerous artifacts recovered, three BWP specimens (Figures 1–3) have become vital physical evidence in the study of Tang Dynasty BWP. Recent research by Xiang (2016) and Chen and Zeng (2024) on the porcelain recovered from the *Batu Hitam* shipwreck has offered new insights into developing and disseminating Tang Dynasty BWP.

Xiang (2016) identified porcelain pieces with inscriptions reading "盈[1](Ying)" and "进奉[2](Jin Feng)" among the recovered items, highlighting their close connection to the Tang Dynasty imperial court. These pieces, produced either by official kilns or folk kilns under official direction, were supplied to the court through systems of local tribute and offerings. The study of their origins has revealed the intricate trade and cultural networks of the Tang Dynasty, with the imperial court playing a central role in facilitating cultural exchange and material circulation. The distribution of porcelain inscribed with "盈" and "进奉" reflects the complexity of these networks and suggests that Tang Dynasty BWP might have travelled along similar routes. These findings offer valuable insights into the early production environment and trade routes that contributed to disseminating Tang Dynasty BWP.

From a broader perspective on Tang Dynasty ceramic culture, Tang Dynasty BWP is a notable example of adaptation to foreign influences. The research by Chen and Zeng (2024) on the polychrome porcelain of the Changsha Kiln from the *Batu Hitam* shipwreck reveals that the Changsha Kiln incorporated foreign decorative elements, such as geometric and animal patterns, which are comparable to those found on the three BWP specimens from the wreck. This reflects a broader trend of cultural integration in Tang

Figure 1. Salvaged Tang dynasty BWP dish with cobalt pigment diffusion. Batu Hitam shipwreck.

Figure 2. Salvaged Tang dynasty BWP dish showing an undegraded glaze surface. Batu Hitam shipwreck.

Figure 3. Salvaged Tang dynasty BWP dish exhibiting localised glaze loss. Batu Hitam shipwreck.

ceramic production and highlights BWP as a significant manifestation of the Tang Dynasty's openness to foreign cultures.

Focusing specifically on the three BWP specimens, these early examples of Tang Dynasty BWP feature cobalt-blue decorations on a white porcelain base, including lozenge-shaped and date-palm-leaf patterns. These designs differ markedly from traditional Tang Dynasty ceramic motifs. Feng (1994), a scholar of ancient Chinese ceramics, noted that such patterns were relatively rare in China during this period but bore a strong resemblance to plant motifs in Islamic art, underscoring the influence of Persian culture. As date palm trees were uncommon in Tang China, and these patterns frequently appear in 9th-century Mesopotamian ceramics (Xiong, 1990, p. 407), it can be inferred that the motifs likely originated from the Persian ceramic tradition. These studies suggest that the production of these Tang Dynasty BWP, along with other porcelain from the ship, was shaped by the exact mechanisms of trade and cultural exchange.

The discovery of Tang dynasty BWP from the *Batu Hitam* shipwreck revealed the in-depth cultural exchange between China and Persia. Chinese artisans incorporated Persian decorative patterns and cobalt-blue pigments into locally produced white porcelain, creating a distinctive and innovative art form. This cross-cultural interaction was evident in producing BWP and other ceramics. While BWP did not achieve mainstream popularity during the Tang dynasty, it laid the groundwork for the later development of BWP. It showcased the ability of Chinese artisans to assimilate and transform foreign cultural elements, driving innovation in Chinese ceramic craftsmanship by integrating external influences.

From a historical perspective, the early cross-cultural integration of BWP served as a blueprint for its subsequent evolution. Over time, this integration became increasingly pronounced, enabling BWP to evolve gradually into a highly versatile and adaptable art form.

Phase 2

Bhabha (1994) theory of hybridity provides a valuable framework for analysing diverse cultural phenomena. This theory asserts that culture is neither fixed nor immutable. Instead, hybrid cultural forms and identities emerge through the dynamic processes of contact, conflict, and integration between different cultural elements facilitated by selective cultural assimilation. It also exposes the mechanisms of cultural evolution shaped by power dynamics. This theoretical lens is particularly significant for understanding the development of Yuan Dynasty BWP, a distinctive cultural artefact.

During the Yuan Dynasty, a unique historical context fostered the development of BWP. While the Mongol invasion caused some disruption to the ceramic industry in certain regions, the ensuing period of relative peace facilitated the expansion of a vast market for Chinese porcelain exports. According to *Chuo Geng Lu* (Retirement to the Countryside) by Tao Zongyi, a Yuan Dynasty scholar, white was associated with dignity and auspiciousness in the cultural customs of the time (Ren & Wei, 2002, p. 149). This concept was highly esteemed by the Yuan elite, leading to the promotion of white porcelain production in the Jingdezhen kilns. Simultaneously, to cater to the preferences of Middle Eastern markets, Jingdezhen artisans began incorporating imported Persian cobalt into their designs. This innovation played a pivotal role in the international commercial success of BWP (MacGregor, 2016, pp. 389–393). Although Persian influence significantly shaped the colour palette of BWP, it evolved into a hallmark of Chinese ceramic artistry.

The compositional design of Yuan Dynasty BWP is celebrated for its intricate complexity. Distinguished by multi-layered designs, meticulous layouts, and densely ornamented patterns, these works exemplify a high level of craftsmanship (Feng, 1982, p. 340). Notable physical evidence of such artistry is preserved in the Turkish Topkapi Palace Museum (Figure 4). Chinese ceramic artisans skillfully incorporated geometric patterns from Islamic art, integrating the *"geometric precepts intrinsic to the Islamic tradition"* with the *"free-flowing spatial organisation that typifies Chinese tradition"*, creating innovative designs and artistic expressions (Finlay, 2010, p. 140). Significantly, while adopting elements of Islamic geometric art, Chinese artisans did not strictly adhere to its established cultural or aesthetic norms; instead, they asserted their creative autonomy, blending external influences with indigenous artistic principles.

Since the 7th century AD, decorative design has played a pivotal role in the visual arts of Muslim societies. The Islamic doctrine's prohibition of representational imagery (Qin, 1999, p. 306) prompted Muslim artisans to navigate the tension between creative expression and doctrinal restrictions. This led to the development of an artistic style that blends abstraction with representational elements. In *The Formation of Islamic Art* (1987), Oleg Grabar highlighted the dual role of Islamic decorative art: to fulfil an aesthetic purpose while conveying profound symbolic meanings (Qin, 1999, pp. 327–328). The core themes of Islamic decorative art consist of calligraphy, stylised floral motifs, and geometric patterns (Bonner, 2017, p. 1). Its design principles are characterised by symmetry, intricate plant-based ornamentation, and rhythmic geometric structures, as illustrated in Figures 5 and 6.

When these foreign artistic elements were integrated into the porcelain designs of Jingdezhen, Chinese artisans adapted them without rigidly adhering to Islamic aesthetic conventions. While preserving the fundamental characteristics of Islamic geometric art, they incorporated traditional Chinese aesthetic sensibilities. This synthesis expanded their creative possibilities, culminating in an innovative and distinctive artistic style.

Figure 4. Blue-and-white Chinese plate. Double phoenix motif, Yuan Dynasty. Topkapi Palace, Turkey.

Figure 5. Islamic art plate, glass. (ca.1350–1357). Metropolitan Museum of art.

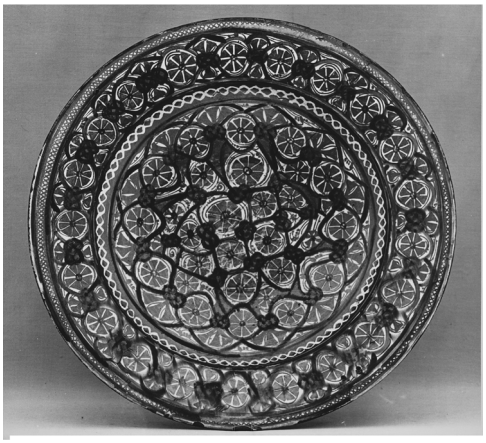

Figure 6. Islamic art plate, earthenware (early 15th century). Metropolitan Museum of art.

The development of Yuan Dynasty BWP was not an isolated cultural phenomenon but firmly rooted in the traditions of Chinese ceramic craftsmanship. During the transitional period between the Song and Yuan Dynasties, many skilled artisans from the Jizhou Kiln migrated to Jingdezhen, bringing advanced porcelain-making techniques, the expertise of applying base glazes, and the sophisticated artistry of ink-wash painting. The underglaze brown decoration motifs and compositional layouts characteristic of the Jizhou Kiln became significant sources of inspiration and adaptation for Yuan Dynasty BWP (Xiao, 2022).

Figure 7. Blue-and-white Octagonal Pear-shaped Vase with Flaring Lip and Two Lions Playing Balls, Yuan Dynasty. Hebei Museum. Photographed by the author.

The Jizhou Kiln was celebrated for its simple yet naturalistic designs and rich repertoire of folk-inspired motifs. Common patterns included flowers, plants, birds in flight, and animal imagery, all imbued with auspicious symbolism reflecting folk traditions. Yuan Dynasty BWP adopted many of these animal and plant themes, often centring the prominent motifs within a centralised composition, complemented by delicate additional decorative elements along the periphery. This distinctive "open" layout heightened the aesthetic appeal of the porcelain, emphasising elegance and balance in its overall visual effect. The result highlights how Chinese artisans, in shaping a unique aesthetic identity for Yuan BWP, fully utilised indigenous cultural traditions while seamlessly integrating foreign influences.

The Yuan Dynasty "Blue-and-White Octagonal Pear-shaped Vase with Flaring Lip and Two Lions Playing Balls" (Figure 7), housed in the Hebei Museum, exemplifies the cultural hybridity of its time. This type of porcelain shape, known as "Yu Hu Chun", first emerged during the transitional period between the late Song Dynasty and the early Yuan Dynasty. The name derives from a wine type, with the advent of distilled liquor prompting the replacement of traditional wine bowls and pots by more specialised vessels. These vases served multiple purposes, functioning as containers, tributes, and decorative items (Chen, 2018).

The central motif on the vase depicts two lions playing with a ball, a symbol of joy and the prosperity of descendants in Chinese culture (Fu, 2008). The neck and base are adorned with symmetrical and rhythmic geometric patterns, including lotus petals, plantain leaves, and key-fret designs. This juxtaposition of Chinese auspicious imagery with Islamic geometric motifs vividly illustrates the innovative creativity of Yuan Dynasty artisans within a context of cultural exchange.

This integration aligns with Homi K. Bhabha's concept of the "third space", wherein disparate cultural forms intersect to create something novel. The geometric patterns on the neck and base retain the formal beauty of Islamic artistic traditions, while the central motif of the lions reflects the Chinese cultural emphasis on auspicious symbolism. Merging these distinct elements produces a unique cultural significance and forges a distinctive aesthetic identity, showcasing the dynamic and creative synthesis emblematic of Bhabha's "third space".

According to Chen (2010), the artistic achievements of the Yuan Dynasty BWP can be attributed to several factors, with the active involvement of Chinese craftsmen playing a pivotal role. During the early Yuan Dynasty, the Mongol rulers abolished the imperial examination system and the imperial painting academy for the Han people. Consequently, many Han literati, deprived of traditional promotion pathways, turned to folk craftsmanship (Zhou, 2016). With their profound cultural attainments, these literati infused a wealth of visual and cultural elements into Yuan Dynasty BWP, imbuing it with a distinctive artistic expression.

Figure 8. David Vases (1351AD), from Yushan County, Jingdezhen made. British Museum.

A notable example is the "David Vases" in the British Museum's collection (Figure 8). Their shape is inspired by traditional Chinese bronzes, showcasing a respect for and continuation of tradition. The decorative elements on the vase are intricate and symmetrical, featuring underglaze blue-painted patterns imbued with auspicious and religious significance, such as four-clawed dragons and cloud motifs (Feng, 2004). Additional patterns, including peonies, plantain leaves, phoenixes, and scrolling grass designs on the neck and base of the vase, reflect the enduring preference for symbolic elements in traditional Chinese aesthetics (Feng, 2001, p. 453). These features highlight the adherence to and inheritance of traditional cultural values by literati artisans.

The vase's geometric proportions and pattern layout exhibit a high degree of regularity and symmetry in terms of structural and decorative arrangement. The repetition of motifs, such as cloud patterns and scrolling grass designs, creates a rhythmic and extended aesthetic reminiscent of Islamic art. This demonstrates the synthesis of multiple cultural influences within the creative process of literati-artisans while also embodying the "ambivalence" inherent in cultural hybridity. The artisans balanced adherence to local cultural traditions by incorporating foreign artistic elements. While addressing external demands, they simultaneously preserved and expressed their cultural identity.

Narrative-themed porcelain represents a distinctive and significant category within Yuan Dynasty ceramics. During the Mongol rule, martial values dominated societal norms, and there was widespread enthusiasm for recounting and disseminating tales of heroism. This cultural milieu provided fertile ground for the flourishing of narrative-themed porcelain that celebrated national heroes. As Feng (1982, p. 351) observed, porcelain adorned with narrative motifs reached its zenith of cultural prominence during the Yuan Dynasty.

Take the "Yuchi Gong Saves His Sovereign with a Single Whip" themed jar (Figure 9) as an example. Unearthed in Hengxian, Guangxi, this artefact is currently housed in the Nanning Museum, while a similar piece is part of the collection at the Museum of Fine Arts in Boston, USA. This jar masterfully portrays the historical event in which Yuchi Gong saved Emperor Taizong of the Tang Dynasty with a single whip. The central narrative scene is rendered with exceptional skill and meticulous attention to detail, vividly presenting the characters and events to the viewer (Figure 9.1).

In terms of overall composition, the scrolling peony patterns adorning the jar's top and neck harmonise with the repeated lotus-petal motif at its base, creating a visually balanced and layered design. The craftsmanship is remarkably delicate, showcasing the artisans' technical expertise and aesthetic sensibilities.

According to Jia and Li (2023), the creation of porcelain depicting historical themes during the Yuan Dynasty was closely intertwined with the literati class's desire to express their thoughts and emotions. The depiction of human figures on BWP adhered strictly to the narrative conventions of traditional

Figure 9. Blue-and-White Narrative Jar, "Yuchi Gong Saves His Sovereign with a Single Whip", Yuan Dynasty. Nanning Museum.

Figure 9.1. "Yuchi Gong Saves His Sovereign with a Single Whip (尉遲恭單鞭救主)", an overall narrative painting expanded.

Chinese painting. Elements such as the characters' postures, expressions, proportions, and spatial relationships were meticulously executed, reflecting deep-rooted local cultural traditions and a profound artistic heritage.

At the same time, the decorative elements of these porcelains show clear influences from Islamic geometric art. For instance, the repeated lotus-petal patterns at the base of the designs illustrate the skilful integration and transformation of Islamic geometric motifs into a distinctly Chinese artistic context, thoughtfully adapted to suit local aesthetic sensibilities. This synthesis highlights the extent of cultural exchange and fusion during the Yuan Dynasty while also serving as a subtle expression of cultural resistance.

Through this unique hybridity, Chinese artisans demonstrated the resilience and creativity of their cultural identity, establishing an aesthetic that preserved Chinese individuality while engaging with foreign influences. This approach safeguarded against cultural homogenisation and enhanced the vitality and global impact of Chinese ceramics in cross-cultural exchanges.

During Mongol rule, the fusion of Islamic cobalt technology with Chinese porcelain craftsmanship catalysed the maturation of BWP. Viewed through Homi Bhabha's theoretical lens of hybridity, this fusion reflects intricate power dynamics. Dong (2007) highlights the profound influence of Islamic culture on the Mongol ruling class, who not only amassed a vast collection of exquisite Islamic artworks but also actively embraced Islamic culture, art, and technological innovations. This cultural exchange positioned Chinese artisans in a context of asymmetric power dynamics. However, by employing strategies of hybridity, these artisans adeptly navigated cultural negotiations, ultimately producing the distinctive BWP of the Yuan Dynasty—a masterpiece that stands as a testament to cultural synthesis and a significant milestone in the history of world ceramics. Furthermore, this unique artistic achievement transcended regional boundaries, exerting a lasting influence on the global stage through cross-cultural trade.

Endowed with unique artistic charm and rich cultural connotations, BWP from the Yuan Dynasty emerged as a highly significant commodity in cross-cultural trade, leaving a profound and lasting impact on the evolution of global art, design, and technology. This influence is particularly evident in the realms of trade and technological exchange. Juan et al. (2007), employing energy-dispersive X-ray fluorescence

(EDXRF) spectroscopy, analysed underglaze spots on Chinese BWP from the Yuan Dynasty (AD 1271–1368) and early Ming Dynasty (AD 1368–1398). Their research identified iron oxide crystallites in the underglaze pigments, revealing that the cobalt used for production was imported from Persian mines. This finding provides indirect evidence of active trade and technological collaboration between China and Persia during this period. Similarly, Perna et al. (2024) utilised Scanning Electron Microscopy–Energy Dispersive X-ray Spectroscopy (SEM-EDS) and Total Reflection X-ray Fluorescence (TXRF) to investigate pottery fragments from the Durrës amphitheatre. Their analysis demonstrated that the glaze on these fragments bore remarkable similarities to that of the Kashan and Qamsar regions in Iran, further corroborating the extensive trade routes linking Yuan Dynasty BWP with the broader Eurasian trade network.

In addition to fostering technological exchange, this trade also contributed to disseminating and synthesising artistic aesthetics. Casolino et al. (2024) analysed ceramic samples from the Durrës amphitheatre, which were initially misattributed to Chinese porcelain due to their close resemblance. Advanced analytical techniques, including Optical Microscopy (OPTECH), SEM-EDS, TXRF, and Powder X-ray Diffraction (XRD), revealed that while the cobalt/arsenic blue glaze on these pieces was influenced by Chinese ceramic technology, the samples were locally produced in the Kashan and Qamsar regions of Iran in the 12th century. Their composition and manufacturing techniques aligned with local Iranian traditions, suggesting that these ceramic items were not direct imports but imitations inspired by Chinese BWP aesthetics. This highlights the far-reaching aesthetic influence of Yuan Dynasty BWP, reflecting its role as a model for innovation and its capacity to inspire cultural integration across regions. Furthermore, the Casolino et al. study confirmed Durrës' historical role as a prominent trade hub, maintaining strong connections with Iran, Syria, and Venice. This underscores the pivotal role of the Yuan Dynasty BWP in facilitating global trade networks and promoting cross-cultural exchange, ultimately shaping the development of artistic styles worldwide.

Phase 3

This phase focuses on how BWP transformed from an Oriental luxury item into a unique European art and culture element during its early European spread. It mainly explores the cultural integration phenomena it triggered and its innovative manifestations in artistic creation.

Wills et al. (2010), in *China and Maritime Europe*, mentioned that foundational interactions between Europe and China profoundly influenced the European elite's admiration for Chinese material culture, mainly porcelain, lacquerware, and silk, which were highly coveted export goods. Before the expansion of maritime trade, European access to porcelain was limited, primarily through diplomatic gifts or scarce overland trade routes. Chinese goods reached Europe via the Middle East and were distributed by Venetian merchants. BWP, with its pure white background and intricate blue designs, captivated European aristocracy, enhancing the material's near-mystical allure. De Waal (2017, p. iii) notes that medieval Florentines believed porcelain could detect and neutralise poisons, echoed in Italian religious paintings of the period. For instance, the Venetian oil painting *The Feast of the Gods* (1514) (Figure 10, Carswell, 1993) depicts a European rendition of what might have been Chinese BWP (Figure 10.1). This style is characteristic of Chinese Ming export porcelain, which found its way to regions such as Persia, Syria, and Egypt from the late 15th to early 16th centuries (Mack, 2001, pp.105–107) before reaching Venice.

Similarly, in Bellini's *Adoration of the Magi*, the Eastern king Caspar is intentionally depicted presenting a blue-and-white porcelain cup filled with gold coins to the infant Christ (Figure 11.1) (Carr, 1997), a detail that underscores the high regard for porcelain and its symbolic connection to divinity.

Associating BWP with the divine was not exclusive to Italian art. An example of this cultural exchange can be found in the Portuguese Renaissance painter Garcia Fernandes' *Anunciação* (Figure 12), which portrays the Angel Gabriel announcing the birth of Christ to the Virgin Mary. At the centre of the composition, a Ming dynasty BWP jar is prominently displayed (Shanghai Museum, n.d.), adorned with motifs of fish and aquatic plants and filled with lilies, a traditional symbol of the Virgin Mary's purity (Figure 12.1). Such motifs—fish and aquatic plants—were common decorative elements on Ming and Yuan porcelain (Figure 13). Introduced to Europe via maritime trade during the Age of Discovery, BWP frequently appeared in sacred scenes within Portuguese and other European artworks, reflecting the high value and symbolic significance it had acquired in European art.

Figure 10. Giovanni Bellini, (1514), the Feast of Gods.

Figure 10.1. Detail.

In contrast to the Middle East's straightforward imitation of Chinese BWP, Europe's approach during the Age of Exploration embraced cultural fusion and creative reinterpretation. Rather than merely replicating the visual elements of BWP, European artists integrated these motifs into their own artistic traditions, reimagining and transforming them. This fusion was not a superficial amalgamation but an innovative synthesis of Eastern and Western visual languages. The patterns and colours of the porcelain engaged dynamically with the techniques and expressive forms of oil painting, fostering new tensions and creative opportunities. This process resulted in artistic expressions that went beyond imitation, illustrating the mutual influence and transformation of Eastern and Western cultures. It enriched the expressive potential of European art and marked a new phase in East-West artistic exchange.

Phase 4

The study of heraldic porcelain exemplifies an extension of cultural fusion, presenting a more intricate hybrid form. In exploring its development, Bhabha (1994) concepts of the 'Third Space' and 'Postcolonial theory' provide valuable frameworks for analysing cultural interactions and power dynamics. The 'Third Space' framework emphasises the creation of new, hybrid cultural identities that emerge at the intersections of distinct cultures. Meanwhile, 'Postcolonial theory' examines the unequal power relations inherent in colonial contexts and their impact on cultural production and dissemination. Together, these perspectives facilitate a nuanced understanding of the East-West interactions and power structures underpinning heraldic porcelain's evolution.

Since the late 15th century, following Vasco da Gama's successful voyage to India in 1498, Portuguese navigators opened direct sea routes to India and China, making Portugal the first European nation to establish sustained contact with China. These maritime links enabled Portuguese merchants to encounter

Figure 11. Andrea Mantegna, (ca.1495–1505), Adoration of the Magi.

Figure 11.1. Detail.

Chinese BWP and introduce it to Europe. As pioneers in this cultural and commercial exchange, Portugal played a decisive role in the initial dissemination of BWP. This era of maritime exploration signified a turning point in East-West cultural interactions, reflected in Europe's adoption and adaptation of Chinese ceramic art.

King Manuel I of Portugal's extensive collection at Lisbon's Santos Palace,[3] showcased in Figure 14, exemplifies this growing European fascination with Eastern porcelain. Comprising 263 plates and 96 dishes, this collection was innovatively displayed on the palace's rooftops, elevating BWP from practical tableware into a symbol of aristocratic prestige and refined taste. This unique display method integrated Chinese porcelain into Portuguese architectural and symbolic practices, illustrating the monarch's role in promoting Eastern craftsmanship. Additionally, the royal tradition of presenting porcelain as diplomatic gifts to distinguished recipients (da Porcelana, 1999, p. 24) highlights how Portuguese nobility embraced Eastern art as part of their aesthetic and cultural practices, marking a significant milestone in the broader narrative of East-West cultural exchange.

The Portuguese enthusiasm for BWP—often termed a 'porcelain complex'—transformed this artefact into an emblem of decorative sophistication and cultural exchange during the Age of Exploration. Today, the ornamental use of ceramic plates in Portuguese homes is a testament to this legacy, demonstrating how early maritime interactions with China shaped enduring aesthetic preferences and fostered the integration of Eastern art into Western cultural traditions.

Among the diverse categories of Chinese porcelain exported to Europe, heraldic porcelain was a distinctive and prestigious genre. It served as a potent symbol of status and identity for European elites, including royalty, nobility, wealthy merchants, and religious institutions. Customised pieces featuring family crests, royal insignia, and religious emblems transcended their decorative function (Jin & Wu, 2006). They embodied the social standing, personal values, and heritage of their owners, often commissioned to celebrate individual achievements or preserve familial legacy.

Figure 12. Garcia Fernandes, (ca.1535–1540), Anunciação.

Figure 12.1. Detail.

The reign of King Manuel I of Portugal (1469–1521) marked a significant milestone in the evolution of heraldic porcelain, reflecting Portugal's ascent as a global maritime power. The establishment of extensive trade routes during this era facilitated the movement of goods and the exchange of artistic and cultural ideas on an unprecedented scale. Central to King Manuel I's identity was the armillary sphere, a

Figure 13. BWP Jar with patterns of fish, Ming Dynasty.

Figure 14. The pyramid ceiling of Santos Palace, Lisbon.

symbolic representation of celestial navigation and exploration, which became his personal emblem and a hallmark of Portugal's maritime ambitions (Aterini, 2022; Moseley, 1974; Vogel & Salzmann, 1995, Figure 15). This motif, accompanied by the inscription "In Deo Spero" ("Hope in God"), was incorporated into Chinese porcelain during the Jiajing period of the Ming Dynasty (1519–1521, Figure 16). These unique pieces blended Portuguese iconography with Chinese craftsmanship, exemplifying an artistic and cultural synergy. The prominent inclusion of King Manuel's heraldic badge not only celebrated his pivotal role in Portuguese maritime achievements but also symbolised the broader aspirations of the European elite. This fusion of Portuguese nautical imagery and Chinese artistry inspired a distinctive aesthetic dialogue and spurred widespread demand for personalised heraldic porcelain across Europe.

The narrative of the BWP teapot adorned with the Peixoto family coat of arms (Figure 17) reflects the aspirations of the Portuguese elite and nobility in pursuing heraldic porcelain. Sino-Portuguese trade during this era faced significant challenges, mainly due to China's stringent trade embargoes from 1522 to 1577. Antonio Peixoto, a Portuguese nobleman and explorer, exemplifies the struggles of this period. In 1542, Peixoto's fleet, barred from entering Guangzhou (廣州) due to the embargo, was forced to seek alternative trading hubs, ultimately turning to Quanzhou (泉州). The embargo severely restricted legal commerce, prompting a transition to illicit trade, including smuggling, to sustain exchanges. These arduous maritime endeavours and the accompanying difficulties in trade significantly increased the value of imported goods. Consequently, items such as this heraldic teapot experienced a dramatic rise in worth—reportedly increasing tenfold—upon their arrival in Europe. They evolved into symbols of wealth and prestige, highly coveted by the European elite (Liefkes & Young, 2008, pp. 68–69; Lu, 2012, p. 83).

Figure 15. King Manuel I of Portugal and his heraldic badge—the armillary sphere. Sources: (Sacro Bosco 1516).

Figure 16. Heraldic porcelain decorated armillary sphere. ca.1519–1521.

The burgeoning demand for Chinese porcelain among Europe's aristocracy drove Portuguese efforts to establish formal trade relations with China. The leasing of Macau in 1557 (Huang, 2015) marked a pivotal moment, transforming the region into a vital hub for the porcelain trade. By 1620, significant quantities of Chinese porcelain were documented as exports from Macau (da Porcelana, 1999, p. 127). This period also witnessed a substantial influx of Spanish silver into China, linking Chinese porcelain production to the global silver trade.

Building on Portugal's successes, Spain established the Manila Galleon route to exchange Mexican silver for Asian luxury goods, including Chinese BWP (Liu, 2023). King Philip II of Spain, noted for his

Figure 17. Ewer with the crest of Peixoto family, ca.1522–1566, Jingdezhen produced.

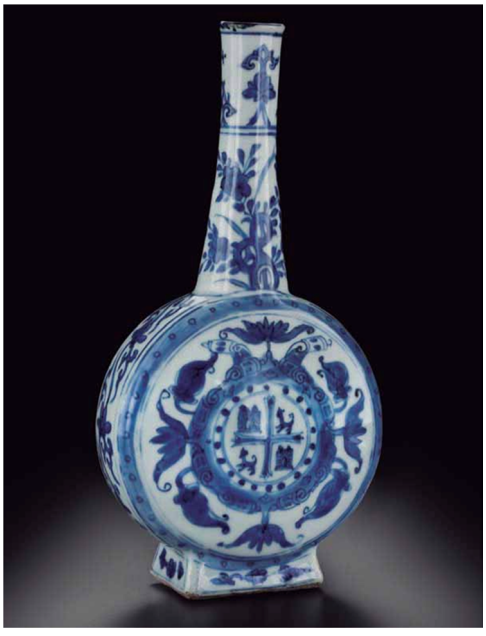

Figure 18. Blue-and-white with the arms of Castile and Léon, ca.1573–1620, Jingdezhen produced.

involvement in the global silver trade, assembled a remarkable collection of Chinese porcelain. Among these was a notable blue-and-white pilgrim flask bearing the Spanish royal coat of arms for Castile and León (Figure 18), described by Krahe (2016). The coat of arms mirrored motifs found on Spanish silver coins (Figure 19) minted during Philip II's reign, symbolising his authority and Catholic identity. By commissioning such heraldic porcelain, Philip II integrated his royal insignia with Chinese luxury craftsmanship, highlighting the symbolic and economic ties between Spanish wealth and Chinese artistry while cementing his legacy within a global context.

The rise and popularity of heraldic porcelain reflect a complex interplay of East-West cultural exchange, identity construction, and power dynamics. The European aristocracy's demand for Chinese porcelain

Figure 19. Spanish Dollar (silver coin), c. 1538–1566.

adorned with family crests or royal insignia was not merely an expression of luxury consumption; it constituted a deliberate use of material and visual symbols to assert and display their social status and cultural capital. This phenomenon aligns with postmodern theories, particularly Bhabha (1994) analysis of how power discourse shapes subjectivity—how power constructs individual and collective identities through the deployment of cultural symbols and practices. The crests on heraldic porcelain serve as material evidence of this discourse, blending European symbols of authority with the refined craftsmanship of Chinese artisans to produce a unique example of "cultural translation".

This "translation" is neither a simple act of replication nor a one-sided imitation; rather, it represents a dynamic process involving power, cultural diversity, material exchange, and transformation—all of which occur within what Homi Bhabha terms the "Third Space". This space disrupts binary oppositions between East and West, instead emphasising the hybrid and innovative cultural forms that arise through such interactions. The production of heraldic porcelain exemplifies this hybridity: European aristocrats commissioned these works, projecting their symbols of power and identity onto the porcelain medium, while the artistry of Chinese craftsmen—potentially influenced by Islamic artistic traditions—was instrumental in shaping the final product. The result was not a unidirectional assertion of European influence but a multifaceted interaction and mutual shaping process, reflecting the nuanced hybridity that characterises this mode of cultural exchange.

Furthermore, we argue that the trading history of heraldic porcelain embodies the intricate and asymmetrical power dynamics between East and West. As demonstrated in our analysis, Portugal and Spain, leveraging control over maritime trade routes, dominated the circulation and valuation of Chinese porcelain. By incorporating their cultural symbols into the designs, they asserted hegemonic power—a process reflective of postcolonial power structures. However, heraldic porcelain's rise and widespread appeal challenge linear historical narratives, instead revealing a temporally complex and nonlinear progression of cultural exchange. This development was not a unilateral Eurocentric process but arose from the interaction of multifaceted factors, including Chinese artisanship, European demand, and global trade networks. Recognising the agency of Chinese artisans and their design contributions disrupts the notion of one-sided dominance, highlighting the mutual influences at play.

Phase 5

By the late 16th century, European demand for Chinese BWP had increased significantly. Portugal, leveraging its trading post in Macau and establishing the Manila Galleon route in 1571, held a dominant position in porcelain imports. The Manila Galleon connected Asia with the Americas, enabling Spain to participate in porcelain trade through its trans-Pacific routes. However, the establishment of the Dutch East India Company (VOC) in 1602 marked a pivotal shift. The VOC quickly overtook Portuguese and Spanish dominance in Asian trade, becoming the leading force in the porcelain market. By the early 17th

century, the Dutch, utilizing their extensive global trade networks and direct control over key Asian routes, began importing vast quantities of BWP from China to meet growing European demand (Borschberg, 2004).

In a letter dated 1616, Jan Pieterszoon Coen, Governor-General of the Dutch East Indies, noted that Chinese artisans were producing porcelain specifically for export to Europe (Volker, 1954, p. 27). These exports were often customized to European tastes, featuring simpler designs, though many retained traditional Chinese motifs such as flowers, landscapes, dragons, and phoenixes. This porcelain was designed to accommodate mass production and endure long-distance transport, showcasing the adaptability of Chinese artisans to European market preferences (Wu, 2019). Through this strategy of tailored production, approximately three million pieces of BWP were exported from Jingdezhen to Europe between 1604 and 1657. This export surge transformed porcelain from an exclusive luxury item reserved for the aristocracy into a widely accessible decorative art form enjoyed by the emerging European middle class. The trade, orchestrated by the Dutch East India Company (VOC), represented a significant shift in the accessibility and cultural significance of porcelain in Europe, establishing it as a staple of European domestic and social life.

Pijl-Ketel (1982) argues that 17th-century Dutch still-life paintings reveal the profound influence of BWP on Dutch social customs and lifestyles. During this period, porcelain became a prominent feature of European daily life, symbolising wealth and cultural exchange. Willem Kalf, renowned for his opulent still-life compositions, prominently featured BWP alongside silverware and exotic fruits, as seen in *Still Life with a Ming Bowl* (Figure 20). This painting exemplifies the affluence of the Dutch Golden Age and the far-reaching global trade networks that introduced such luxury items to Europe. Similarly, Johannes Vermeer's *Girl Reading a Letter at an Open Window* (Figure 21; Figure 21.1) incorporates BWP into a domestic scene, reflecting its growing presence in middle-class households. These artworks depict aspects of daily life and underscore the cultural and economic significance of BWP in Dutch society, symbolising prosperity and global interconnectedness.

Homi Bhabha's theoretical framework in *The Location of Culture* (1994)—particularly his concepts of 'mimicry,' 'hybridity,' and the interplay between 'marginality' and 'centrality'—offers valuable insights into the evolution of Delftware. It illuminates how Delftware transitioned from imitating Chinese BWP to developing a distinctive European style. Moreover, this framework provides a basis for analysing potential future trajectories in cultural hybridity.

During the late Ming dynasty (16th–17th centuries), political turmoil and maritime embargoes severely disrupted the export of BWP from China, causing a shortage in the European market. In response, European artisans sought alternatives, particularly in the Netherlands. By the mid-17th century, potters in Delft began imitating Chinese BWP, carefully replicating its shapes and decorative motifs (Odell, 2018;

Figure 20. Kalf. W. (ca. 1656–1659). Still Life with a Ming Bowl.

Figure 21. Vermeer, J. (ca.1657). Girl Reading a Letter at an Open Window.

Figure 21.1. Detail.

Xin, 2011). However, the absence of essential materials like kaolin meant that Dutch imitations, crafted from tin-glazed earthenware, were less durable than Chinese porcelain. Between 1630 and 1670, Dutch artisans, supported by the Dutch East India Company (VOC), imported high-quality white glazes and cobalt blue pigments from China, which allowed for significant improvements. Over time, they not only reproduced Chinese designs but also developed Delft Blue—a distinctive European style tailored to the tastes of the local market (Van Emden, 1917). While Dutch potteries could not match the hardness or translucency of Chinese porcelain, Delft Blue became widely popular, meeting European demand with its recognisable blue-and-white aesthetic.

The disruption of the Chinese porcelain trade spurred significant advancements in porcelain manufacturing techniques in France and Saxony during the late 17th and early 18th centuries. In France, artisans developed soft-paste porcelain as a practical alternative to Chinese hard-paste porcelain despite its comparatively lower durability and reliance on a substitute for high-quality kaolin. Meanwhile, the Meissen factory in Saxony made a breakthrough in 1710 by successfully producing hard-paste porcelain, closely emulating the Chinese original (Wu, 2021). These innovations addressed key challenges European ceramics manufacturers face, including the scarcity of raw materials and the complexities of high-temperature firing techniques.

Although other European countries achieved significant advancements in porcelain production, Delftware is relevant to this paper due to its distinctive evolution. Initially, Delft potters closely replicated the techniques of Chinese BWP to satisfy European market demands. However, as competing European ceramic industries advanced, Delft artisans adopted a more innovative approach, incorporating Dutch cultural elements and artistic traditions into their designs. This transition marked the development of a unique European style. Despite these changes, Delftware retained the hallmark aesthetic of Chinese BWP—its iconic white background adorned with blue motifs. This enduring feature sustained a connection to Eastern artistic traditions while establishing Delftware as a distinctive cultural expression within Europe.

Delftware, mainly home decor and craft items (as illustrated in Figures 22 and 23) alongside tiles, embodies a rich local cultural aesthetic. These products, which were never produced in Jingdezhen, gave Delftware a distinctive competitive advantage over traditional BWP. The extensive export of Delftware further facilitated its dissemination across Europe, solidifying its influence. Renowned Delft ceramic masters, such as Albrecht de Keiser, Van Steen, and Rudolphus van Varick, gained acclaim for their exceptional ability to depict large-scale landscapes and genre scenes on tiles (Figure 24). These creations went beyond household applications, serving as architectural decorations and becoming integral elements of Dutch urban design (Moore, 1909, pp. 12–13).

The influence of Delft blue tiles extends well beyond the 17th and 18th centuries, holding a significant place in contemporary art and architecture. Many buildings in the Netherlands still feature blue-and-white tiles from these earlier periods, showcasing their enduring legacy. In 1999, the Royal Delft Pottery factory created a remarkable adaptation of Rembrandt's masterpiece, *The Night Watch*, as a tile painting composed of 480 hand-painted tiles (Figure 25). This work pays homage to Rembrandt's iconic painting, a symbol of the Dutch Golden Age, and exemplifies the fusion of Delft blue ceramic artistry with Dutch artistic achievements. This synthesis reflects a revival of 17th-century Dutch painting and ceramic traditions within a modern context. Additionally, the traditional blue-and-white aesthetic continues to be incorporated into contemporary architectural designs, underscoring Delftware's lasting influence on Dutch decorative arts. By seamlessly blending historical heritage with modern innovation, Delft ceramics remain a profound cultural touchstone in contemporary society.

We present a refined analysis of Delftware's evolution from imitation to innovation:

- Marginality and Centrality: Mimicry under Power Imbalance:

Delftware initially held a marginal status as it emerged by imitating Chinese BWP. To address the high European demand for BWP, Delft potters adopted mimicry as a key strategy. This was not a simple replication but a complex and strategically contradictory act shaped by the monopolistic power of the Dutch East India Company (VOC) and the resulting asymmetrical power dynamics. Bhabha's concept of "mimicry" is particularly relevant: mimicry functions as both compliance with

Figure 22. Uknown. (ca. 1690–1700). Altar candlestick made of faience. Bruikleen van Museum Catharijneconvent.

Figure 23. van Eenhoorn, L. (ca. 1690–ca. 1720). Delftware tulip vase. Rijksmuseum.

Figure 24. Aelmis, J. (ca. 1760–1780). Large-scale ceramic tile. Rijksmuseum.

Figure 25. Royal Delft Factory. (1999). Rembrandt's The Night Watch adapted as Delft tile painting [Photograph]. Photograph by René Dinkel.

and potential resistance to the dominant culture, where its inherent "incompleteness" exposes the vulnerabilities of the central authority's power. While reflecting marginality, this incompleteness simultaneously empowered Delft potters with opportunities for resistance and the reconstruction of a unique cultural identity.

Strategic mimicry was evident in multiple forms, including the VOC's control over market demand and resource access. Delft potters navigated the challenges of catering to European aesthetic preferences while preserving their artistic identity. This tension led to the production of an incomplete yet innovative style, which ultimately laid the groundwork for Delftware's distinctive evolution.

- Hybridity and Innovation: The Convergence of Local and Global:

Delftware's success stemmed not from an exact replication of Chinese BWP but from its ability to integrate local cultural themes and preferences, resulting in the distinctive "Delft Blue". This exemplifies Bhabha's theory of "hybridity", wherein cultural fusion leads to innovation. "Delft Blue" preserved the core aesthetic of a "white background with blue patterns" while localising patterns and forms. This approach honoured the source culture while catering to European markets. The selective absorption and transformation process showcased creative reinterpretation, combining two distinct cultural elements into something unique. This was not a simple layering of influences but a deliberate act of cultural hybrid, meeting global market demands while fostering local cultural innovation.

- Prospects: Ongoing Cultural Hybridity and its Challenges:

Delftware's success and sustained influence on contemporary architecture and art provide significant insights into cultural hybridity. "Mimicry" is expected to evolve into a more sophisticated and strategic process, with marginal cultures actively engaging in the global cultural dialogue. This shift will see "hybridity" becoming a mainstream phenomenon, dissolving cultural boundaries and enabling dynamic recombinations of artistic elements to generate novel cultural meanings and values.

The case of Delftware illustrates how marginal cultures can establish a distinct cultural identity through deliberate "mimicry" and transformative "hybridity", ensuring their continued impact on future cultural innovation. Such cultural integration will further the evolution of human civilisation. However, addressing the accompanying challenges, such as managing cultural differences and conflicts effectively, is crucial to ensure the sustainability of this hybridity-driven progress.

Phase 6

An in-depth exploration of the enduring influence of BWP on the history of European art inevitably highlights Portugal as a pivotal cultural nexus. Since the 16th century, Portugal's extensive trade relations with the East have profoundly shaped its artistic landscape, exemplified by the blue-and-white tile murals known as "Azulejos". These murals, adorning iconic buildings such as the Carmo Church in Porto (Figure 26), emerged as a celebrated narrative art form in Portugal during the 16th and 17th centuries. By the 18th century, "Azulejos" had become a defining symbol of Portuguese cultural heritage (Ventura Teixeira, 2020).

Initially, the colour palette of Portuguese tiles ("Azulejos") included blue, yellow, green, and white. Still, during the 16th century, a profound shift occurred as the blue-and-white theme rose to prominence. This transformation was inspired by Portugal's enthusiastic assimilation of Chinese BWP and was further influenced by Dutch Delft tiles. This transition encapsulates Portugal's cultural openness and deep engagement with the Far East, with the widespread adoption of blue-and-white designs embodying the fusion of Eastern and Western aesthetics.

Figure 26. Exterior view of Igreja do Carmo, Porto.

Figure 27. The Cloisters at Porto Cathedral.

"Azulejos" became pervasive across Portugal, especially in royal palaces, religious edifices, and private residences. As Gelin (2021) observes, "Azulejos" transcend the boundaries of decorative art or painting; they represent a monumental form of spatial art that seamlessly bridges these two domains. Whether embellishing the facades of churches or concealed within interior spaces (Figure 27), "Azulejos" demonstrate remarkable adaptability to their architectural environments.

Originating in Moorish culture, Azulejos were initially inspired by Byzantine and Roman mosaic art (Mitchell, 2017), later evolving through the Italian Renaissance to incorporate richer narrative and decorative elements. As a result, Azulejos emerged as a quintessential example of multicultural artistic fusion. Their transformation into a uniquely Portuguese and globally revered narrative art form was particularly accelerated by their extensive application in city architecture following the 1755 Lisbon earthquake.

In the wake of this disaster, Azulejos became profound symbols of cultural expression, serving as a medium to portray Portuguese society's collective trauma and resilience. They transcended their traditional ornamental purpose, telling powerful stories of loss, recovery, and hope, thereby establishing themselves as a significant narrative art form (Gelin, 2021). Their widespread integration into urban architecture, including prominent public and religious buildings, marked a pivotal moment when Azulejos was recognised as an independent and autonomous art form. This evolution highlights the capacity of art to chronicle societal change and preserve cultural identity, with the distinctive blue-and-white motif becoming an enduring hallmark of Portuguese artistic heritage.

Johannes Itten's colour theory (1973) underscores the emotional and psychological potency of colour combinations in art, particularly their expressive and symbolic impact. The influence of BWP on European art and design reveals a progression from a niche medium to a central element in European aesthetics. Despite changes in design, the blue-and-white colour palette's enduring appeal reflects its profound emotional and cultural significance. This timeless motif, embodying the synthesis of Eastern and Western artistic traditions, positions blue-and-white as a cornerstone in the cross-cultural artistic dialogue between China and Europe.

Discussion

To address the research question, *"How can the historical narrative of blue-and-white design be leveraged to inspire and enrich its contemporary and future applications?"* BWP has been selected as the central focus of this study. Recognising its importance in tracing the evolution of global design and fostering cultural exchanges, our examination highlights the interaction between Chinese and Western design influences. We have categorised this evolution into six phases based on the specific periods in which these phenomena emerged. These phenomena' periods, locations, and historical contexts critically shape the outcomes of our investigation into blue-and-white cultural design.

Our analysis of these historical developments consistently employs Homi Bhabha's theoretical framework, with its core concepts guiding our research findings. Together, these findings comprehensively address our research question as follows:

Finding 1: Stability and innovation of the core design gene in cross-cultural interaction

During the first and second phases, the interaction between BWP and Persian and Islamic cultures transformed it into a hybrid art form, demonstrating the complex dynamics of cross-cultural exchange. BWP incorporated Persian decorative patterns, such as rhombus and date palm leaf patterns, which were rare in traditional Chinese ceramics but prevalent in Islamic art. Additionally, adopting Islamic cobalt blue pigment significantly altered its aesthetic expression. However, despite these adaptations, the core design gene of BWP's signature blue-and-white composition remained remarkably stable throughout its subsequent evolution.

Based on Homi Bhabha's hybridity theory, this study introduces the concept of "cultural gene recombination of blue – and – white porcelain" to further explore the adaptability and resilience of BWP's core design gene in cross-cultural contexts. This stability can be attributed to two factors: its inherent visual appeal and profound cultural symbolism. The blue-and-white colour scheme has considerable aesthetic value and resonates deeply with the historical cultures of both China and the West. This intrinsic stability has made BWP a universal visual language, enabling it to spread globally.

Crucially, this stability also lays the foundation for continuous innovation. While assimilating foreign elements, BWP has always maintained its core design characteristics, allowing it to adapt seamlessly to various cultural contexts. This adaptability provides valuable lessons for contemporary designers:

1. **Preservation of Core Cultural Elements:** In cross-cultural design projects, identifying and preserving the fundamental design genes of cultural products is of great significance. This approach ensures that the design outcomes are both innovative and culturally meaningful. For example, modern product designers can draw inspiration from BWP's iconic blue-and-white colour scheme to create household appliances embody cultural heritage while balancing functionality and contemporary aesthetics.
2. **Open Integration of Cross-Cultural Influences:** The "cultural gene recombination of blue – and – white porcelain" concept encourages designers to adopt an inclusive attitude towards diverse cultural influences. As BWP integrated Persian and Islamic elements, contemporary designers can also blend elements from different cultures. For instance, in the fashion industry, combining traditional Chinese patterns with modern Western design principles can create unique styles that appeal to a global audience. The historical example of BWP shows that careful cultural gene recombination can promote innovation and enrich global cultural exchange and development.

Finding 2: Symbolic translation and Re-creation in power structures

During the third and fourth phases, BWP underwent a significant evolution within the European artistic context, reflecting the intricate process of design-creation driven by cross-cultural interactions. The integration of BWP into European aristocratic culture was particularly remarkable. By incorporating heraldic patterns, BWP was transformed from a utilitarian object into a symbolic medium of political and social authority. This transformation was not a simple act of cultural imitation but a profound translation of power symbols across cultural boundaries. While maintaining its visual coherence and cultural heritage, BWP acquired new political and social meanings.

Heraldic motifs in BWP exemplify its core design elements' adaptability, which were re-interpreted to symbolize aristocratic power. In Homi Bhabha's concept of the "third space", different cultures collided and merged, giving rise to new cultural identities and power dynamics. The aesthetic foundation of BWP, initially shaped by Persian and Islamic artistic influences, was further re-defined through its integration with European aristocratic symbols. This process was not a mechanical combination but a meticulous reconciliation of Eastern artistic traditions with Western expressions of power, with full respect for the unique cultural attributes of both traditions.

From a historical perspective, this phenomenon highlights the expansion of cultural recombination in multiple dimensions. The early exchange between BWP and Persian-Islamic cultures mainly focused on the hybridization of technology and aesthetics, while its integration into European aristocratic culture extended this recombination to the symbolic and political domains. This evolution has enriched the cultural significance of BWP and established it as an essential bridge connecting the cultures and politics of the East and the West. The continuous process of cultural recombination across historical periods, cultural boundaries, and power structures demonstrates the remarkable resilience and innovative potential inherent in BWP design.

- Unique Implications for Contemporary Design
- **The Remolding of Power and Cultural Symbols:** Contemporary designers can draw on the transformation of symbolic meanings of BWP in power structures and consider how to endow ordinary elements with new social and cultural values in modern design.
- **The Expansion of the Depth of Cultural Integration:** The case of the integration of BWP and European aristocratic culture inspires designers that when integrating multiple cultures, they should not merely stop at the splicing of surface elements but dig deep into the core connotations of different cultures to achieve a more in-depth integration. For example, in interior design, the profound integration of Eastern Zen culture and Western minimalism in terms of spatial layout, color matching, and material selection can create a unique spatial atmosphere.

Finding 3: Cultural fusion and the infinite evolutionary potential in future design

Building on the first two findings, Finding 3 examines the long-term influence and prospects of BWP. In earlier phases, the core design gene of BWP demonstrated both innovation and stability during cross-cultural interactions (Finding 1), while its symbolic meaning was redefined within power structures (Finding 2).

In the fifth and sixth phases, the historical trajectory of BWP, shaped by cultural gene recombination, highlights its enduring adaptability and appeal in diverse cultural contexts. European appropriation and reinterpretation of BWP, as seen in the development of Delftware and Azulejos, exemplify cultural gene recombination. These processes integrated and transformed BWP's core design elements within new cultural frameworks.

The iconic blue-and-white aesthetic of BWP, sustained through various cultural adaptations outlined in Finding 1, persisted under the influence of regional cultures, resulting in hybrid art forms resonating with European artistic, social, and architectural traditions. This fusion of Eastern and Western artistic traditions provides a model for future design practices. The concept of cultural gene recombination offers a valuable lens for understanding the modern adaptation of traditional designs. The integration observed in Delftware and Portuguese Azulejos demonstrates the transcendence of BWP's symbolic and aesthetic elements across time and space, enriching the cultural gene pool and inspiring contemporary and future design innovations.

BWP's ability to adapt and merge with local cultural elements underscores the versatility of its core design principles, such as its balance of colour and form, which have wide-ranging applications in fields like architecture, visual communication, and product design. Itten's colour theory further explains the emotional resonance of BWP's blue-and-white palette, a defining feature of its cultural symbolism, emphasising its potential to establish emotional and psychological connections in future design contexts. By drawing on BWP's historical development, designers can combine tradition with innovation, ensuring this timeless aesthetic continues to evolve while retaining its cultural significance.

In conclusion, BWP's cross-cultural development underscores the importance of cultural gene recombination in design. The stability of its core design gene (Finding 1), its symbolic transformation within power structures (Finding 2), and its evolution through cultural fusion (Finding 3) provide valuable insights for contemporary design. These findings deepen our understanding of BWP's historical development and offer practical guidance for advancing cross-cultural design innovation in the future.

Concluding vision for future application of blue-and-white design

BWP's historical journey has indisputably proven its timeless aesthetic allure and extraordinary cultural adaptability. Over centuries, the blue-on-white composition, BWP's core design gene, has not only withstood the test of time but also thrived in constant innovation, remaining relevant across diverse cultural settings.

Our research reveals that, under the influence of cultural gene recombination, this core design gene has continuously evolved, adapting to different cultural environments while steadfastly preserving its unique identity. This unique characteristic of BWP holds significant implications for future design applications.

Looking ahead, BWP's rich legacy can be considered a precious resource for contemporary and future designers. Its remarkable ability to blend with local artistic and social contexts paves the way for novel design concepts seamlessly integrating tradition and modernity.

Moreover, the rapid progress in material science offers new perspectives for studying BWP. Non-invasive analytical techniques, in particular, allow us to explore the material culture of BWP in greater depth. Understanding its material origins, trade routes, and compositional details can enhance our historical understanding of BWP and uncover hidden design potential. These insights can be translated into innovative design solutions, further enriching the application of BWP in future design projects.

In summary, as BWP continues to inspire new creative interpretations, its role in future design is to bridge the gap between historical depth and creative innovation. By drawing on its profound cultural heritage and entirely using modern technological tools, designers can ensure that BWP maintains its historical significance and emerges as a dynamic and influential force in the global design arena, constantly evolving and adapting to meet the ever-changing demands of the design world.

Study limitations

The study is circumscribed by the accessibility of historical data, mainly from museum artifacts that might embody selective viewpoints. Moreover, the available contextual information restricts the interpretation of these artifacts. Although Bhabha's hybridity theory provides a robust framework for analyzing cross-cultural exchange, it may not comprehensively encompass all aspects of the intricate interactions underlying BWP's evolution. These limitations underscore further interdisciplinary research's need to enhance the understanding of BWP's role in cultural dialogue and design evolution.

Notes

1. "盈", which is believed by many scholars in the academic field to refer to the "Baibao Daying Treasury" in the Tang Dynasty. Porcelain items inscribed with "Ying" were most likely tributes presented to the royal court and stored in this treasury.
2. "进奉" refers to the extra tributes presented by senior central and local bureaucrats to the emperor beyond the regular levy scope.
3. The Santos Palace in Lisbon, now the French Embassy, is also known as Palácio dos Marqueses de Abrantes.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

No specific grant from public, commercial, or not-for-profit funding agencies supported this work.

About the author

Meizi Gu is a PhD candidate in Design at the University of Lisbon, supervised by Professor Anita Fang Chen (Chalmers) and Prof. Maria Joao Neto (ULisboa). Her research focuses on the intersection of cultural heritage, design, and cross-cultural exchange, specifically examining the influence of blue-and-white porcelain (BWP) on contemporary design practices. Her PhD thesis, Echoes of Blue and White: The Design Development of Eastern and Western Countries, from Past to the Future, explores how traditional blue-and-white porcelain serves as a bridge between Chinese and Western cultures, offering insights into its adaptation for modern creative industries. This research not only highlights the historical and aesthetic significance of BWP but also aims to redefine its role in future design innovation, contributing to the sustainable development of cultural heritage. The study presented in this paper ties directly to her broader research on the transformative potential of traditional art in global design dialogues.

ORCID

Meizi Gu http://orcid.org/0000-0001-8193-9068

References

Ahmed, G. K. (2021). The Silk Road Cultural Belt: China-Arab Cultural Exchange and Mutual Learning from the Tang to Yuan Dynasties (Wang, G., Trans.). West Asia and Africa (06), pp 3-27+156.

Aterini, B. (2022). The armillary sphere: A representation of the celestial sphere and knowledge symbol. In: Ceccarelli, M., López-García, R. (Eds.), *Explorations in the history and heritage of machines and mechanisms. HMM 2022. History of mechanism and machine science* (vol. 40). Springer. https://doi.org/10.1007/978-3-030-98499-1_27

Bhabha, H. K. (1994). *The location of culture*. Routledge.

Bonner, J. (2017). *Islamic geometric patterns: Their historical development and traditional methods of construction*. Springer.

Borschberg, P. (2004). The Santa Catarina incident of 1603: Dutch freebooting, the Portuguese Estado da Índia and Intra-Asian trade at the dawn of the 17th century. *Revista de Cultura*, *3*(11), 12–25. https://edocs.icm.gov.mo/rc/RC11I12.pdf

da Porcelana, C. (1999). Dinastias Ming e Qing (The Porcelain route, Ming and Qing Dynasties). Fundação Oriente.

Carr, D. W. (1997). Andrea Mantegna: the Adoration of the Magi. Los Angeles: The J. Paul Getty Museum.

Carswell, J. (1993). "The Feast of the Gods" the porcelain trade between China, Istanbul and Venice. *Asian Affairs*, *24*(2), 180–185. https://doi.org/10.1080/714857116

Casolino, C., Falcone, F., Perna, M. G., Metalla, E., Rosatelli, G., Stoppa, F., & Antonelli, S. (2024). Exploring Durrës between East and West: Discovery of a protostonepaste—archaeological context and archaeometric analysis. *Heritage Science*, *12*(1), 84. https://doi.org/10.1186/s40494-024-01200-w

Chaffee, J. (2013). Cultural transmission by sea: Maritime trade routes in Yuan China. In Eurasian Influences on Yuan China (pp. 41–59). ISEAS–Yusof Ishak Institute.

Chen, J. (2010). 元青花艺术成就原因探索研究[F.T. Exploration of the causes of the artistic achievements of Yuan blue and white porcelain. 文艺争鸣[Literary Debates],(5),80-83.

Chen, J. (2018). The philosophy of material conservation in Song and Yuan dynasty ceramic packaging: A case study of Meiping and Yuhuchun vases. *China Ceramics*, *54*(2), 70–74. https://doi.org/10.16521/j.cnki.issn.1001-9642.2018.02.012

Chen, N., & Zeng, B. (2024). 唐代长沙窑彩瓷艺术风格及其形成原因探析——以"黑石号"沉船出水瓷器为例 [Analysis of the artistic style and formation causes of colored porcelains from Changsha Kiln in the Tang Dynasty: Taking the Porcelains Unearthed from the Batu Hitam Shipwreck as Examples]. *Research of Chinese Fine Arts*, *2024*(2), 103–113.

De Waal, E. (2017). The White Road: Journey into an obsession (Liang. Q, Trans.). Guangxi Normal University Press.

Dong, B. (2007). A brief discussion on the influence of Islamic culture on the arts and crafts of the Yuan Dynasty. *Journal of Soochow University (Engineering Science Edition)*, (5), 4–6.

Feng, X. (1994). 青花瓷的起源與發展 (F.T. The Origins and Development of BWP). *Palace Museum Journal*, *2*(02), 29–39+97. https://doi.org/10.16319/j.cnki.0452-7402.1994.02.005

Feng, X. (2001). 中國陶瓷*Chinese ceramics*. 上海古籍出版社Shanghai Chinese Classic Publishing House.

Feng, X. (2004). 元代瓷器上的龙文装饰(上) [Dragon decorations on Yuan dynasty porcelain (Part I)]. *Art Market*, *2004*(05), 66–68.

Feng, X. (1982). *Chinese Ceramic Society (Chinese Edition). History of Chinese ceramics*. Cultural Relics Publishing House.

Finlay, R. (2010). *The pilgrim art: Cultures of porcelain in world history*. University of California Press.

Fu, C. (2008). 清代双狮戏球栽绒毯 [Qing Dynasty double lions playing with a ball velvet carpet]. *Forbidden City*, (*08*), 74–75.

Fu, L. (1977). 漢唐史論集*(F.T. collected essays on the history of the Han and Tang Dynasties)*. Linking Publishing Company.
Gelin, S. (2021). Finding refuge in reason and religion: Understanding pombaline-era architecture and reform through 18th-century Azulejo. *Legacy*, *21*(1), 2.
Hall, S. (1996). Who needs 'identity'?. In S. Hall & P. du Gay (Eds.), *Questions of cultural identity* (pp. 1–17). Sage Publications.
Hsieh, M. (2002). A discussion of the Chinese Ceramics recovered from the wreck of the Batu Hitam. *Taida Journal of Art History*, *13*, 1–60+277. https://doi.org/10.6541/TJAH.2002.09.13.01
Hu, W., & Lei, Q. (1993). 广西横县出土元青花人物故事图罐(F.T. A blue and white figure jar from the Yuan Dynasty was discovered in Hengxian County, Guangxi). *Cultural Relics*, *1993*(11)90-91+103+93-94+106.
Huang, H. (2015). 汪柏私許葡人通市: Wang Bo allows Portuguese to have trade relations privately. *Academic Journal of One Country Two Systems*, *2015*(04), 187–192.
Itten, J. (1973). *The art of color*. Van Nostrand Reinhold.
Jia, Y., & Li, J. (2023). The artistic form principles of Yuan Dynasty blue and white porcelain—take Wei Chigong saving his master with a single whip as an example. *Journal of Social Science and Humanities*, *5*(1), 176–180. https://doi.org/10.53469/jssh.2023.5(01).35
Jin, G., & Wu, Z. (2006). Ming and Qing dynasty Chinese Porcelain in Portugal. *Palace Museum Journal*, *2006*(03), 98–112+159. https://doi.org/10.16319/j.cnki.0452-7402.2006.03.007
Juan, W., Leung, P. L., & Jiazhi, L. (2007). A study of the composition of Chinese Blue and White Porcelain. *Studies in Conservation*, *52*(3), 188–198. https://doi.org/10.1179/sic.2007.52.3.1888
Kaczmarczyk, A., & Hedges, R. E. M. (1983). *Ancient Egyptian Faience: An analytical survey of Egyptian Faience from Predynastic to Roman Times*. Aris & Phillips.
Krahe, C. (2016). Chinese porcelain in Habsburg Spain (pp. 38–273). *Centro de Estudios Europa Hispánica*. ISBN-13: 978–8415245513.
Li, W., Lu, X., Luo, H., Sun, X., Liu, L., Zhao, Z., & Guo, M. (2017). A landmark in the history of Chinese ceramics: The invention of BWP in the Tang dynasty (618–907 A.D.). *STAR: Science & Technology of Archaeological Research*, *3*(2), 358–365. https://doi.org/10.1080/20548923.2016.1272310
Liefkes, R., & Young, H. (2008). Masterpieces of world ceramics in the Victoria and Albert Museum (pp. 68–69). V&A Publishing.
Liu, X. (2023). Arguments by Spanish Merchants about the loss of silver to China around the 16th century. *Trends of Recent Researches on the History of China*, *2023*(05), 35–41.
Loureiro, R. (2013). Building an image of China in the sixteenth century. In T*he exotic is never at home*: The presence of China in the Portuguese Faience and Azulejo (17th-18th Centuries). Museu Nacional Do Azulejo.
Lu, Z. (2012). (ed.). *Passion for Porcelain: Masterpieces of ceramics from the British Museum and the Victoria and Albert Museum*. National Museum of China.
MacGregor, N. (2016). *A History of the World in 100 Objects*. (Yu, Y, Trans.), New Star Press.
Mack, R. E. (2001). *Bazaar to piazza: Islamic trade and Italian Art, 1300-1600 (1st US Edition 1st Printing)*. University of California Press.
Mitchell, R. (2017). Portuguese art: Portuguese azulejo. In E. D. Donne (Ed.), *Fine arts in Europe: The last 10 centuries* (pp. 341–360). Michelangelo Project/Pixel.
Moore, N. H. (1909). *Delftware-Dutch and English*. Hodder & Stoughton.
Moseley, W. W. (1974). "O Rei Do Mar": Portugal the sea, and Gil Vicente. *Luso-Brazilian Review*, *11*(1), 98–104. http://www.jstor.org/stable/3512656
Nianfeng, H. (2006). The cultural exchange of ceramics between the North and the South as seen through the porcelain of the Jizhou kilns. *Collectors*, *2006*(11), 13–16.
Odell, D. (2018). Delftware and the domestication of Chinese porcelain. *EurAsian Matters: China, Europe, and the Transcultural Object*, *1600–1800*, 175–202.
Perna, M. G., Falcone, F., Casolino, C., Metalla, E., Rosatelli, G., Antonelli, S., & Stoppa, F. (2024). Analysing the glaze of a medieval ceramic fragment from the Durres Amphitheater in Albania. *Heritage Science*, *12*(1), 82. https://doi.org/10.1186/s40494-024-01175-8
Pijl-Ketel, C. L. v d. (1982). *The Ceramic Load of the 'Witte Leeuw' (1613)*, Kist, J. B. (Coord.). (Ed.). Rijksmuseum.
Qi, D. (2017). Study on the salvaged antiques from the Batu Hitam Shipwreck. *Palace Museum Journal*, *2017*(03), 6–19+158. https://doi.org/10.16319/j.cnki.0452-7402.2017.03.001
Qin, H. (1999). 伊斯兰文明*Islamic civilization* (Chinese Edition). China Social Sciences Press.
Ren, M. G., & Wei, Q. M. (2002). 中外陶瓷邮票 *(Chinese and foreign ceramic stamps)*. Shaanxi Science and Technology Press.
Sacro Bosco, J., Münzer, J., & Campos, H. (Trans.). (1516). *Tractado da Spera do Mundo Tirada de Latim em Lingoagem Portugues. Évora: Germão Galharde. Biblioteca Pública de Évora, RES 0404*. Digital reproduction by Internet Archive (ark:/13960/s20v38kxfd5).
Shanghai Museum. (n.d). Fusion of China and the West: I. Chinese Porcelain in Oil Paintings. Accessed October 2, 2024. https://www.shanghaimuseum.net/mu/show/202205/28773ef2-a9d5-464f-a45d-ae4eb59e0bcf/chapter2-1.html
Van Emden, F. (1917). Delft tiles. *The Art World*, *2*(6), 555. https://doi.org/10.2307/25588112

Ventura Teixeira, C. (2020). A palimpsest of ornaments: The art of azulejo as a hybrid language. *Renaissance Studies*, *34*(4), 593–623. https://doi.org/10.1111/rest.12591

Vogel, K. A., & Salzmann, M. (1995). Armillarsphäre und Frühe Globen Vor 1492/armillary sphere and early globes before 1492. Der Globusfreund, 43/44, 31–54. http://www.jstor.org/stable/41622067

Volker, T. (1954). Porcelain and the Dutch East India Company: as recorded in the Dagh-registers of Batavia Castle, those of Hirado and Deshima and other contemporary papers 1602–1682. E.J. Brill eBooks. http://ci.nii.ac.jp/ncid/BA2699341X

Wan, M. (2003). 明代白银货币化的初步考察(F.T. preliminary examination of silver Monetization during the Ming Dynasty). *Researches in Chinese Economic History*, *2003*(02), 39–51.

Wan, M. (2004). Silver as currency in the Ming Dynasty: New perspective of the connection between China and the Rest of the World. *Hebei Academic Journal*, *2004*(03), 145–154.

Wen, R. (2012). *The cobalt blue pigment used on Islamic ceramics and Chinese BWPs* [Doctoral thesis, University of Oxford]. ISNI: 0000000379127938.

Wills, J., Jr, Cranmer-Byng, J., Peterson, Jr, W., & Witek, J. (2010). *China and Maritime Europe, 1500–1800: Trade, settlement, diplomacy, and missions*. Cambridge University Press.

Wu, R. (2019). Type and terminology of export porcelain in the late Ming dynasty. *Ceramic Studies*, *34*(1), 8–12. https://doi.org/10.16649/j.cnki.36-1136/tq.2019.01.004

Wu, R. (2021). Saxony court's Asian porcelain collection and European hard porcelain production. *Palace Museum Journal*, *2021*(11), 99–113 + 142 + 143.

Xiang, K. (2016). "黑石号"沉船中"盈"、"进奉"款瓷器来源途径考 [Research on the Source Routes of Porcelains with "Ying" and "Jinfeng" Inscriptions on the Batu Hitam Shipwreck]. *Archaeology and Cultural Relics*, *2016*(6), 47–55.

Xiao, J. (2022). The transmission of decorative motifs in the history of Chinese song and yuan ceramics technology—on the origin of decorative motifs on yuan blue and white porcelain. *Frontiers in Art Research*, *4*(13), 94–97. https://doi.org/10.25236/FAR.2022.041318

Xin, T. (2011). On Dutch East India Company and the development of Kraak Porcelain during the Late Ming and Early Qing. *China Ceramic*, *47*(09), 35–36 + 47.

Xiong, L. (1990). 中国陶瓷与中国文化Chinese Ceramics and Chinese Culture. Hangzhou:浙江美术学院出版社 (F.T. Zhejiang Academy of Fine Arts Press). ISBN: 9787810190725

Xu, M. (2012). 土耳其、伊朗馆藏元青花考察亲历记(增订本) Shanghai People's Press. ISBN: 978–7208106017

Zhang, F., & Cowell, M. (1989). The source of cobalt blue pigment in Ancient China. *Sciences of Conservation and Archaeology*, *1*(01), 23–27.

Zhou, C. (2016). 元代科举之罢与蒙汉观念之"冲突" [The abolition of imperial examinations in the Yuan Dynasty and the conflict between Mongolian and Han concepts]. *Journal of Anhui University (Philosophy and Social Sciences Edition)*, (6), 90–98. https://doi.org/10.13796/j.cnki.1001-5019.2016.06.011