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Cross-Cultural Encounters: Religious Motifs in Lattimo Glass from China to Italy

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Abstract: This paper focuses on lattimo glass, also known as milk glass, and analyzes the influence of Chinese porcelain on its creation in Venice through the study of its transmission path and revival. It also explores the role of religion in the glass trade between China and Italy from the fifteenth to the eighteenth centuries, with a particular focus on religious iconography. By relying on previous research on the religious iconography of glass during this period and analyzing precious glass objects, this paper aims to examine the brief popularity and decline of lattimo glass as an imitation of Chinese Ming porcelain in the fifteenth to sixteenth centuries, as well as the significance and impact of religious iconography on lattimo glass during the eighteenth century. The paper approaches the process of the introduction of Chinese aesthetics in Europe during this period from three angles: the origin of lattimo glass, the cross-media imitation and innovation of Chinese religious iconography, and cultural interaction. This process highlights the crucial role of influential religious imagery in the formation of cross-cultural communication.

Keywords: lattimo glass; cross-cultural design; Venice; porcelain; Chinoiserie

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1. Introduction

The production of lattimo glass, also known as porcellana or milk glass, in Venice during the fifteenth to eighteenth centuries is an intriguing subject that reflects the cross-cultural encounters between China and Italy. The term "lattimo" is of Italian origin, and Luigi Zecchin has traced its use back to the 14th century in the Latinized form "attimum" in his research (Zecchin 1963). The compositional ingredients of "attimum" were essentially the same as those of "lattimo". It was achieved by incorporating tin oxide crystals (cassiterite) to render the glass opaque or milky white (Verità 2021). While organizing visual materials on lattimo glass, it was observed that the decorative patterns of lattimo exhibit exotic characteristics.

To achieve this research objective, the paper adopts a multidisciplinary approach that incorporates historical analysis, art object analysis, comparative studies, and cross-cultural investigations. In previous studies, the interaction of Chinese and Italian glass has sparked much discussion. Firstly, there is much research on the people who contributed to this exchange of glass in a specific period, such as improvements to lattimo by Angelo Barovier in 1450 (Dorigato 1993; Francis 2008; Koleini et al. 2019; Zecchin 2020), and the use of glass within royal houses, both Eastern and Western, as a diplomatic gift (Curtis 2017, p. 14; Sun et al. 1997, vol. 1, p. 1261). Secondly, the significance of religious factors in cross-cultural contexts has been highlighted (Boyer and Ramble 2001). Thirdly, there was keen interest among academics in how the eighteenth-century re-innovation of lattimo glass in Venice (Haden 1976) challenged conventional glassmaking techniques and influenced the development of Chinese porcelain (Wood 1999). The reasons behind this cross-cultural design phenomenon relate to Chinese emperors (Hardie 2000), trade exchanges (Koleini et al.

2019), glass markets, and technological progress (Ricciardi et al. 2009). Additionally, the comparative study of porcelain and glass is also noteworthy (Burty 1869; Knothe 2010). A comparative study between porcelain and glass highlights the distinctive features and potential connections between these two mediums (Zhang 1730, pp. 139–47). Scholar Yang has studied Western influences on Qing glass in China in the eighteenth century (Yang 1983), the interaction of Eastern and Western porcelain and glass culture, and the chemical composition of Qing Dynasty glass (Yang 1990). In addition, other scholars have also addressed the dissemination of Western artifacts to China (Qisheng and Fengwen 1999), the incorporation of Western elements (Lu 2012) and influences (Curtis 1993) in Chinoiserie porcelain, and the adoption of Chinoiserie art styles (Impey 1977). However, the religious implications of lattimo glass in cross-cultural design, particularly its imitation of Chinese porcelain from the mid-15th century to the 18th century in China, have received little attention from the academic community.

This study involves a comprehensive investigation of cultural encounters and the circulation of goods, individuals, and information. It analyzes conventional printed sources, such as early travel writing from Western ministers, as well as collections of glass from museums. Data from these moderately well-known sources are supplemented with cross-cultural materials accumulated from the lattimo glass created by the Miotti family in Venice from the fifteenth to the eighteenth century, and the few eighteenth-century Chinese chronicles containing descriptions of glass products utilized for exchange and cross-cultural trade with locals in China. This special collection sheds light on the relations between early Italian crafts and the cross-cultural design of China. In a bigger sense, it is conducive to better communication between the two societies.

Therefore, this paper aims to explore the influence of Chinese porcelain on the creation and development of lattimo glass, particularly focusing on the role of religious motifs in the glass trade between these two regions. Firstly, it examines the dissemination routes and revival of lattimo glass, along with the influence of Chinese porcelain on the creation and development of Venetian glass, with a specific emphasis on the role of religious motifs in the glass trade between these regions. Secondly, it investigates the imitation and innovation of religious iconography in lattimo glass, particularly during the mid-15th century to the early 16th century, reflecting Italy's interest in and emulation of Chinese porcelain through its religious decorative patterns. Lastly, this study examines the relationship between religious imagery on 18th-century Venetian glass and glassware from the Qing Dynasty in China. This study, employing a multidisciplinary approach and utilizing diverse sources, contributes to a comprehensive understanding of the cross-cultural dynamics and visual significance of religious motifs in lattimo glass as decorative elements.

2. Imitation of Chinese Porcelain: Historical Interactions of Lattimo Glass

Glass patterns, as a 'recognizable system of knowledge' (Pevsner 1964, p. 79), are craft objects influenced by different regional religions, cultures, and aesthetics in specific eras. The analysis of religious patterns in lattimo glass from a cross-cultural perspective is a revalidation of aesthetic capabilities in different regions and an effective means to examine the changes in artisanal aesthetics (Janson 1977). There is no doubt that cultural exchange between Italy and China is a highly complex issue. Glass, as a material and one of the most diverse mediums in terms of design methods and craftsmanship, vividly illustrates the role of religion in cross-cultural artistic aesthetic transformations during specific periods.

Specifically, the history of glass reflects its cross-cultural significance. Glass formed a long-distance exchange network culture as early as 1400–1100 BCE in the Mediterranean and the Nordic Bronze Age. Since the thirteenth century (Dwairy 2015, p. 73), Venice has been known worldwide for its ornate glasswork, with a multitude of glass-making factories gathered on Murano Island leading glass innovation and design. According to the latest explanation given by (Verità 2021), the applications of lattimo were relatively limited until the mid-fifteenth century as it was applied to enamels, mosaics tesserae, or blown glass. Subsequently, around 1450, the Murano glassmaker Angelo Barovier made

improvements to the design (Zecchin 1989). In the middle of the 15th century, the brothers Jacobo and Bono d'Angelo became the first producers of lattimo glass (Mentasti 1982, p. 50).

In addition, during this period, the Chinoiserie style, representing the influence of Chinese aesthetics, permeated into Europe, sparking a craze for its unique characteristics. For instance, Chinese porcelain gained immense popularity among European nobility. The popularity of Chinese porcelain in Europe during that time can be attributed to two main factors. Firstly, Europe had not yet mastered the key techniques required to produce such ceramics. Secondly, Europeans found the exotic aesthetic style of Chinese porcelain intriguing. The decorative patterns, colors, and shapes of Chinese porcelain were significant components of the distinctive Eastern style. Within the decorative patterns of Chinese porcelain, various symbols with Eastern religious significance were incorporated, which later became defining features of the Chinese aesthetic. These symbols were widely embraced throughout Europe.

Therefore, under the influence of this Chinoiserie style, lattimo glass gradually adopted its distinct opaque white appearance, with its production techniques gradually evolving towards those employed in Chinese porcelain. The lattimo glass was employed in the production of opulent blown glassware embellished with gilding and enamel (Clarke 1974). From the end of the fifteenth to the beginning of the sixteenth century, the number of records of lattimo glass grew: a vague record of "uno marsoretto de lactimo schietto" from 1496 (Levi 1895, p. 21), the lattimo work by Giovanni di Giorgio Ballarin in 1511 (Levi 1895, p. 28), a list of lattimo glass made by Ballarin in 1512 (Levi 1895, pp. 47–48), etc. Therefore, researchers can find that the manufacture of lattimo glass, gold decorations, and enamel objects reached a new height in the sixteenth century (Jo Wheeler 2010). In the sixteenth century, glass was adopted as an exquisite utensil that could be given as gifts by royal families in both the East and West. This practice facilitated the exchange of glass recipes and decorative patterns. However, the later collapse of the Republic of Venice in 1797 caused even greater difficulties for Murano's glass manufacturing industry (Alaoui et al. 2007), whereupon lattimo glass gradually became a rare item. Later, lattimo glassmaking was taken over by the Miotti and Bertolini families (Charleston 1990), who had been active in the eighteenth century. In the eighteenth and nineteenth centuries, as a result of the exchange between the East and West, the production of lattimo glass was influenced by Chinese porcelain, leading to its resurgence in popularity (Fuga 2006). This revival brought about advancements in technology and the emergence of new style patterns, making a remarkable impact on the history of cross-cultural design. Design culture and its historical significance were interpreted as innovative and cross-cultural entities, with their distinctive features transmitted through material objects such as lattimo glass.

Specifically, regarding the patterns of lattimo glass as a cross-cultural material medium, its interaction with motifs containing religious elements is primarily influenced by trade factors. The trade between the East and West can be traced back to the sixth century, when 38 Chinese potters sold their products to Japan, South Korea, and Southeast Asia together with tea and spices (Gleeson 1998) before the Chinese Ming Dynasty (1368–1644) further expanded on the maritime trade exchanges of the Yuan Dynasty (1271–1368) and began to produce Chinese export porcelain for the European market (Smith 2003). After this long period of cross-cultural artistic and technical exchange, Chinese porcelain entered European countries such as Italy as a commodity (Whitehouse 1972). One of the earliest records of Chinese porcelain owned by Venetians is a bochal de porzelane (bowl of porcelain) listed as belonging to the painter Jacobello del Fiore in 1439 (Alaoui et al. 2007, p. 265). Records also survive (Wilhelm 1879, vol. II, p. 230) of 30 pieces of Ming porcelain owned by Doge Francesco Foscarini in 1442. Therefore, from the mid-fifteenth century, lattimo glass opened the prologue to the interaction between China and Italy.

In the 16th century, Chinese porcelain sparked a Chinoiserie aesthetic trend in Europe. The exquisite craftsmanship of Ming Dynasty porcelain garnered great admiration from the European nobility (Chen 1964). When Chinese porcelain became available in European shops in 1580 (Hyde 1994, p. 49), it was regarded as a rare and precious luxury

item. The Medici family (1549–1609) in Italy collected a large amount of Chinese porcelain and gave it to the Dresden court as a precious gift (Eva Ströber 2006). Moreover, the French royal family, Spanish aristocrats, and several titled Europeans at that time began acquiring Chinese porcelain as a symbol of status and wealth (Lane 1961). Meanwhile, court members and wealthy businessmen encouraged Italian glass manufacturers to trade in Europe in the sixteenth century. The presence of Chinese porcelain in Venice encouraged the development of lattimo. Many Venetian glass families such as the Fratelli Toso, Salviati, and Miotti families began to show technological innovations in glassmaking, and Venice became a major European market at the beginning of the sixteenth century. Venetian glassware and maiolica began to imitate Chinoiserie styles in order to meet the needs of the market. In the early sixteenth century, Venice created Venetian alla porcellana majolica to imitate Chinese blue-and-white porcelain, which was bought by the Nuremberg and Augsburg families (Bortolotto 1981, p. 64), while Andreas Imhof commissioned Venetian alla porcellana majolica for his wedding (Lessmann 2004, pp. 236–64). More and more orders from Europe for Chinese porcelain were made during the sixteenth century, which made it appear even more rare and valuable. In addition, as a transit point for trade between the East and West, Venice began to imitate Chinese porcelain frequently, from maiolica to glass. Therefore, this love of Chinese porcelain and trade policies that encouraged innovation indirectly affected the imitation of Ming porcelain in lattimo glass. Then, as a substitute for Ming porcelain, lattimo glass began to appear as dinner utensils or gifts (Curtis 2017, p. 15). Cross-cultural creation is the process by which artists understand and recreate a specific artistic style in a specific social context, and this kind of innovation in glassware, incorporating different cultural backgrounds, is a reflection of the gradual independence of design from arts and crafts.

During the 17th century, the decorative patterns of glassware produced in Venice featured a significant presence of designs incorporating religious elements or Chinese-inspired styles, primarily influenced by the aesthetic styles of the Meissen porcelain factory and Sèvres porcelain factory. During this period, some factories in Europe gradually mastered the crucial recipe for producing porcelain and began imitating Chinese porcelain. These renowned ceramic factories enjoyed a prestigious reputation in the field of ceramic manufacturing. On the one hand, both the Meissen and Sèvres factories were inclined to incorporate religious elements, such as mythological figures and scenes from Apollo mythology, into their decorative patterns. On the other hand, these factories mass-produced Chinese-inspired porcelain or glassware, imitating Chinese ceramics in terms of decoration and technical aspects. Many of their designs incorporated elements of Chinese culture, such as flowers, birds, and figures. The aesthetic styles and techniques employed by these ceramic factories greatly influenced the emergence of religious-themed patterns in Venetian glassware, resulting in a closer resemblance between Venetian glassware and ceramic products in terms of decoration and artistic expression. Lattimo glass, as a synthesis of technology and cross-cultural art, embodies both Eastern aesthetic significance and technical expertise. Through technical emulation of decorative patterns found in Eastern art, lattimo glass demonstrates a pure acknowledgement of Chinese aesthetics. These Chinese-inspired decorative patterns often carry religious connotations in China and serve as material manifestations of the dissemination of Chinese religious elements in Europe. During this period, China was primarily influenced by Taoism and Buddhism, which frequently resulted in the presence of symbolic motifs such as birds and lotus flowers in porcelain decorations, representing purity, auspiciousness, and religious symbolism. From a cross-cultural perspective, Chinese porcelain emerged as a luxury commodity in the European market, which facilitated the imitation of Chinese porcelain by lattimo glass at the level of commercial trade (Tonini 2007). In this process of imitation, the religious elements present in Chinese porcelain were also emulated in lattimo glass. This imitation primarily served aesthetic purposes rather than religious intentions. The diversity of artistic aesthetics evoked European appreciation for exotic religious aesthetics and subsequently con-

tributed to the incorporation of Chinese religious elements in the decorative patterns of lattimo glass.

The revelation of Chinese components in lattimo glass drove a movement away from an emphasis on production towards a concern with exchange interaction, from considering the role of objects inside individual societies towards a consideration of their development between societies. The link between the image of the artifact and the objective bio-psycho-social layer is two-way (Dwairy 2015, p. 73). As lattimo glass crosses social boundaries, it is coordinated into new collections, adjusted to specific settings, and altered by those who use them, reflecting how traded objects are appropriated things. Cross-cultural design interaction is not a single historical issue but the coming together of a specific era, market, aesthetic, culture, and design style.

3. Mimicry and Innovation: Depicting Religious Motifs in Lattimo Glass

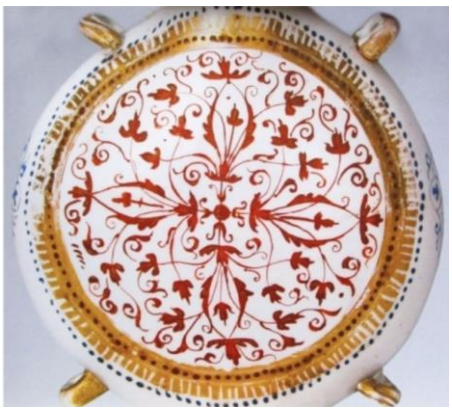
Lattimo glass starts to imitate the religious patterns of Eastern porcelain in a Europeanized fashion. It is an interesting phenomenon to imitate through different materials. Despite the evident differences between Eastern and Western religions at the time, religious motifs served as exotic decorative elements that were widely disseminated in cross-cultural contexts through the medium of color and pattern. This cross-cultural interaction greatly influenced the aesthetic tendencies of European craftsmen, who were deeply inspired by Chinese decorative styles.

Chinoiserie porcelain represented exotic social artifacts, acquired through trade and brought from distant lands by European voyagers. During the historical interactions of lattimo glass as an imitation of Chinese porcelain, the popularity of Ming porcelain, especially blue-and-white porcelain, grew rapidly in Europe. Portuguese traders were among the first to introduce these exquisite porcelain wares from China to various parts of Europe in the early sixteenth century, and later, the Dutch further expanded East-West trade from 1602. The allure of Chinese aesthetics and cultural features, combined with the curiosity of European aristocrats and collectors, gradually led to the rise of the Chinoiserie style in the eighteenth century (Honour 1962, p. 83). In the 18th century, the exoticism of Chinese aesthetics and cultural features had a profound impact on the aesthetic preferences of Europe through the extensive export of items such as ceramics, silk, and wall hangings, leading to a heightened interest in exotic styles (Porter 2010, p. 35).

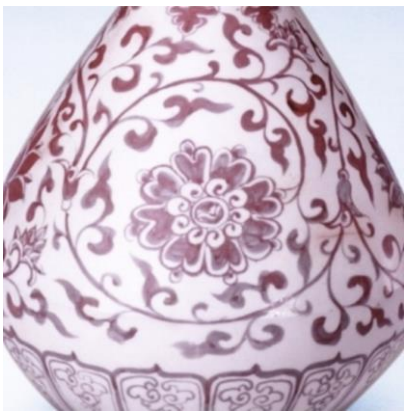
Specifically, there exists a certain relationship between the innovation of religious motifs in lattimo glass and Chinese religious culture (Curtis 2017, p. 16). During the Yuan, Ming, and Qing dynasties (1271–1912), Chinese porcelain decoration was popular, using colored motifs on white porcelain bodies (Su 2005). The colored motifs of that period included blue and white underglaze (*you xia qing hua* 釉下青花), red underglaze (*you li hong* 釉裏紅), and contrasting colors (*dou cai* 鬥彩). Kublai Khan, the khagan of the Yuan Dynasty, especially liked red, white, and cyan colors, and a large number of white porcelains have been found in the remains of kiln sites from the Yuan Dynasty. The recipe for white porcelain includes 0.1% lead oxide (PbO) and 26.46% aluminum oxide (Al_2O_3) in its glaze (Zhao 1986). According to (Zhao 1986), this is a kind of white porcelain similar to glass, called white-colored glaze (*liu li* 琉璃) during the Yuan Dynasty. During the Yuan Dynasty, the rulers of the Mongol Empire embraced Tibetan Buddhism as their religion, and the preference of Emperor Kublai Khan for red, white, and blue colors was influenced by religious factors. In Tibetan Buddhism, the color white symbolizes purity, clarity, and flawlessness, representing compassion and wisdom in Buddhist beliefs. The color blue symbolizes the power, steadfastness, and tranquility of Buddhism. According to Buddhist doctrines, red signifies the wisdom and strength of the Buddha, as well as the compassion and motivation inherent in the Buddhist faith. Therefore, under the influence of his religious beliefs, Emperor Kublai Khan tended to favor red, white, and blue colors, applying them in art, court decorations, and religious rituals. This preference also reflected the close connection and cultural exchange between the Mongol Empire and Tibetan Buddhism at that time. With the beginning of overseas trade in the Yuan Dynasty, Jingde Town (*jingdezhen* 景德鎮)

kilns began to produce porcelain for export to meet European demand (Wang 1981). The religious aesthetic of the Yuan Dynasty was also conveyed to Europe as a symbolic vehicle through the exportation of porcelain. After that, with the frequent trade during the Ming Dynasty, white porcelain with Chinoiserie aesthetics was continuously exported to Europe and other places. The Chinese-style religious aesthetic style persists. According to records, the number of pieces of Chinese porcelain trafficked by the Dutch East India Company alone reached about 150,000 between 1602 and 1682 (Chen 1997). Therefore, the effect of imitating white porcelain with lattimo glass may have a certain connection with China's preference for white porcelain, meaning Eastern and Western motifs begin to appear exotic.

The connection between the different materials can be found by comparing (Figure 1) the Chinoiserie motifs of lattimo glass in the early sixteenth century with red underglaze (*you li hong* 釉裏紅) porcelain from the Ming Dynasty.



(**A-1**)



(**A-2**)

Figure 1. Comparison of lattimo glass and red underglaze (you li hong) porcelain: (**A-1**) Small Vase with a Scene of Apollo and Cyparissus' Story (1500–1510), No.F. 468, Italy, Murano, lattimo glass, H.20 cm, the State Hermitage Museum, courtesy of the State Hermitage Museum; (**A-2**) red underglaze spring vase with lotus pattern jade pot (you li hong chan zhi lian wen yu hu chun ping) (1368), Ming dynasty, China, red underglaze porcelain, H.32.5 cm. the Palace Museum, courtesy of the Palace Museum.

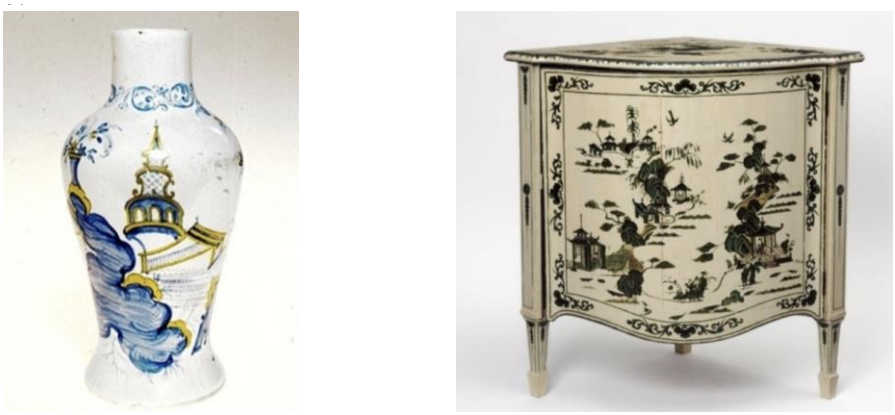
The lattimo pilgrim flask (A-1 in Figure 1) has completely different motifs on the front and back, with the obverse depicting the story of Apollo and Cyparissus. The lattimo pilgrim flask is a typical glass vessel that combines Chinese Buddhist ideas with ancient Greek religious concepts in Europe. According to (Clarke 1974), the motif on the obverse is very similar to a print by Benedetto Montagna (1480–1541) in Italy. The motif of Apollo and Cyparissus on the lattimo pilgrim flask emphasizes the themes of love, loss, and the transformative power of gods in Greek mythology. Furthermore, the motif on the reverse side (A-2 in Figure 1) bears a closer resemblance to an extended representation of Chinese Buddhist motifs. The flowers and leaves of the lattimo motif are decorated with red enamel instead of the blue and white of the porcelain often found in the East–West trade. This imitation of red enamel connects it to red underglaze (*you li hong* 釉裏紅) porcelain.

The red underglaze (*you li hong* 釉裏紅) porcelain was invented during the Yuan dynasty, and this style was further developed during the Hongwu (洪武) period (1368–1398) of the Ming Dynasty, with motifs including tangled lotus, tangled peony, grass, and leaves. Due to its auspicious religious connotations and its embodiment of the material dissemination of Tibetan Buddhism in China, as well as its cultural significance related to gold and wealth, red underglaze porcelain (*you li hong* 釉裏紅) gained significant popularity in the region. The A-2 in Figure 1 shows red underglaze (*you li hong* 釉裏紅) porcelain (Ming Dynasty) from the Palace Museum. The part shown in A-2 is dominated by a lotus motif with twisted branches and a supplementary curly grass motif. The motif of the tangled lo-

tus appeared after Buddhism was introduced to China (Guo and Ding 1998, pp. 7–8), and the juxtaposition of lotus petals forming a larger lotus has special religious significance. The intertwined vine and lotus motif, also known as the interlocking vine lotus pattern, is a combination of the interlocking vine motif and the lotus motif. It incorporates both the interlocking vine pattern and the lotus flower design. This motif is characterized by intertwining plant branches and leaves along with the graceful depiction of lotus flowers. The combination of these two elements represents the intertwining of wisdom and purity in Buddhist symbolism. It serves as a visual representation of the harmonious coexistence of wisdom and purity within Buddhist philosophy. The curly grass extends left and right or up and down in a wavy form, and (Guan 1992, p. 40) believes that the curly grass motif may have evolved from the combination of the cloud and honeysuckle motifs. Furthermore, the development of the honeysuckle motif was influenced by the acanthus ornament motif (Riegl 1992). The overall composition is symmetrical and neat. This kind of composition (seen in A-2), with a flower in the middle surrounded by leaf or flower patterns, is a typical composition in China. The entwined plant roots are like flowing curves, making the motif appear more dynamic. The interlocking vine motif, commonly known as the "endless knot", holds significant meaning in Buddhism. It symbolizes the boundless wisdom of Buddhism and the widespread propagation of the Dharma. The interlocking vine pattern is composed of intertwined plant branches and leaves, creating a continuous texture and pattern. The infinite loop and interplay in this design represent the concept of egolessness and the boundless nature of existence in Buddhist doctrine. The interlocking vine motif is also regarded as a symbol of auspiciousness, prosperity, and vitality, reflecting the concepts of harmony, continuity, and balance in Buddhism. This motif frequently appears in Buddhist art and architecture, such as murals, sculptures, Buddhist scriptures, and pedestal designs, adding aesthetic value and religious significance to Buddhist temples and places of worship.

Comparing A-1 and A-2, the A-1 bottle features Italian woodcut-themed stories on one side of the body, with Chinese-style religious patterns on the back (as shown in the picture). It is evident that the design of the pattern on the back of A-1 clearly imitates the decorative elements and style of A-2. This observation highlights the influence of religion in cross-cultural art. Religion transforms into an aesthetic symbol with decorative appeal, which is imitated by Italian artisans. Looking at the composition, A-1 also uses the curve of the tangled branches of the curly grass motif to connect the elements. However, the difference is that A-1 does not use a composition with a main flower in the center of the curly grass pattern, but adopts a more regular cross-shaped composition, producing a more geometric visual effect. On the two sides of the bottle of A-1, the front shows a story similar to the theme of Italian woodcuts, and the back is a Chinoiserie religious motif. It shows that although the glass manufacturers in Venice imitated the Chinoiserie style, they still added innovation to the process. The imitation and innovation of Chinese religious styles are not only evident in lattimo glass but also in contemporary home decor patterns of the same period. For example, the Comer Cupboard (A-4 in Figure 2) exemplifies this fusion of Chinese religious style within the context of European-style furniture. While maintaining the overall European furniture design, the decorative patterns on the Comer Cupboard exhibit a distinct Chinese religious aesthetic. The pattern on A-4 demonstrates the influence of Chinese Taoist religious philosophy in both composition and content. The composition emulates the scattered perspective found in traditional Chinese landscape paintings, while the decorative elements primarily feature landscapes and pavilions, capturing a sense of aesthetic beauty that reflects the implicit expression of harmony and integration between humans and nature in Chinese Taoist thought. In addition, the color of the A1 is based on red underglaze porcelain (*you li hong* 釉里红), with blue dots and gilded light around a central motif. Blue and white is the predominant color combination in European imitations of Chinese-style patterns. For example, in A-3 of Figure 2, some Chinese-inspired works also incorporate red or gold, creating a color combination of blue, white, red, and gold. This color pattern is associated with the Eastern religious aesthetic on one hand, and

with the artistic style of Imari porcelain exported from Japan to Europe on the other hand (Yuan 2005). This imitation of porcelain by glass not only reflects the transfer of technique but also has a visual exoticism. As a special material with decorative meaning, glassware was passing through a unique period in both Italy and China at that time. Design is a constantly changing activity, and from the perspective of the lattimo glass, the transfer of technology through different materials shows that design has become an independent art.



(**A-3**) (**A-4**)

Figure 2. Contrast of scattered perspectives by Chinoiserie motifs: (**A-3**) Vaso (18th century), Bertolini or Miotti Family, Cl. VI n. 01598, Italy, Venice, lattimo glass, Museo del Vetro di Murano, courtesy of Museo del Vetro di Murano; (**A-4**) Comer Cupboard (1768–1778), Thomas Chippendale, W.24:1,2-1917. London, pine, Victoria and Albert Museum, courtesy of Victoria and Albert Museum, https://collections.vam.ac.uk/item/073631/comer-cupboard-chippendale-thomas-sr/. (accessed on 11 January 2023).

The design of glass vessels, under the influence of regional cultures in China, Italy, and other areas, reflects the role of inclusive innovation in themes, patterns, forms, and formulas. Glass artisans work not according to a fixed set of principles and rules, but rather create new themes, glass formulas, and pattern decorations throughout their careers to cater to market aesthetics. One important factor that contributes to the decorative differences in lattimo glass patterns is the influence of religious ideology. Based on the long-term influence of different religious thoughts, lattimo exhibits certain variations in Italy and China.

4. Cross-Cultural Exotics: Lattimo Glass and Chinese Glass in the 18th Century

Additionally, when we switch our perspective to China, we discover an interesting phenomenon: the influences and changes in glassmaking were mutual. While Chinoiserie was gaining popularity in Europe, Venetian glassmaking technology also spread to China, thereby influencing the development of Chinese glass, particularly during the eighteenth century (Zhang 1730, pp. 139–47). The production of Venetian glass is related to the close contact between the Chinese emperor and Western missionaries (Yang 1998). The technology of Venetian glass, particularly lattimo glass, influenced the innovation of Qing opaque white glass during the eighteenth century in the Qing Dynasty in China, incorporating certain Chinese elements. This part will further explore the mutual religious motifs between China and Italy, and even within the broader European context, from the perspective of lattimo glass. This influence is reciprocal, rather than unidirectional.

4.1. The Qing Dynasty's Reinvention of Italian Glass Recipes and Patterns

The prevalence of glass in the Chinese region was also influenced by East–West trade. The spread of glass to China has a history of 2500 years, with glass having other localized names in ancient China, such as *liao qi* (料器) or *liu li* (琉璃). During the Han Dynasty (in 8 CE), Roman glass appeared in China. According to archaeological discoveries when

the Jian-Yao-Miao Tombs of the Emperors were excavated in China, the objects discovered not only included Western glass bowls but also objects of cultural significance to the West. These objects proved that glassware was already an important trade item on the Maritime Silk Road as early as 266 CE. With frequent trade between the East and West, glass, as a trade item of cross-regional cultural exchange, became one of the chief items of East–West maritime trade alongside porcelain, tea, and spices during 1127–1279 (Fairbank and Goldman 1998, p. 92; Minkov and Hofstede 2012).

In 1602, the Dutch East India Company (Vereenigte Oost-Indische Compagnie, or VOC for short) was founded, quickly seizing the Portuguese trade market in East Asia and beginning to monopolize international trade. In the seventeenth century, China's Ming and Qing dynasties opened trading ports and Western missionaries went to China to preach. European Jesuits began to come to China in the second half of the sixteenth century, with missionaries like Matteo Ricci, Tang Ruowang, Kilian Stumpf, and others bringing a large amount of European scientific and technological knowledge to China and enjoying close contact with the Qing emperors. In the Qing Dynasty, Bai Jin, a Jesuit priest in China, asked for advice from the European Christian church on how to make glass products. Glass, as an imported product from Europe, was greatly admired by the emperors of the Qing Dynasty. Therefore, in 1696, missionary Kilian Stumpf, who was born in Forsberg, Germany, assisted in setting up a glass factory (called the glass factory of the hall of mental cultivation manufacturing office: *yang xin dian bo li chang* 養心殿玻璃廠) in China to teach the Chinese craftsmen various glassmaking techniques (Heping 2008). Stumpf also brought the formula for raw materials and firing technology for porcelain to Vienna, Venice, and other places in Europe. The glass technique introduced to China by Stumpf also originated in Venice. The development of China's glass manufacturing industry reached its peak in the Qing Dynasty, and the glass body painted enamel lotus and longevity patterns snuff bottle in Figure 3 (5.2 cm high and 4 cm wide) is the embodiment of the integration of the Eastern and Western aesthetic interests of the Qing Dynasty and Italian Renaissance respectively, through the adoption of the technique of applying gold enamel to white glass snuff bottles.

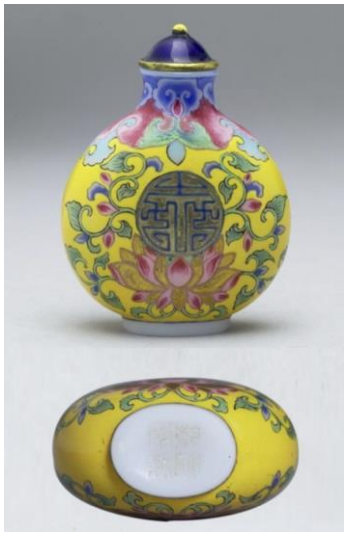


Figure 3. Glass snuff bottle decorated with lotus blossoms and the "myriad" "longevity" characters in painted enamels (boli tai hua fa lang lian hua shou wen bi yan hu), Qianlong reign (1735–1796), Qing dynasty, glass, the National Palace Museum, courtesy of the Taipei National Palace Museum, https://digitalarchive.npm.gov.tw/Antique/Content?uid=53664&Dept=U. (accessed on 15 January 2023).

From the eighteenth to the nineteenth century, through trade between China and Italy, many Western missionaries went to China to preach, thereby also spreading glass

technology to China. In the eighteenth century, the glass industry in China prospered under the influence of Western missionaries as the Qing Dynasty established cross-cultural exchanges through religious communication and trade. In 1720, the Emperor of China received Pope Clement XI's Venetian glass as a gift (Zecchin 2009). From then, the Qing emperor's personal aesthetic tendencies were continuously integrated into the glass products, which meant the glass products presented a Kangxi-style aesthetic tendency different from the Western style during the 18th and 19th centuries. The glass of this period is basic but with an elaborate appearance and intricate shading and patterning. According to the statistics of the Qing Dynasty's construction office, Emperor Kangxi sent 136 glass vases made in Beijing and many other pieces of glassware to the Pope and European emperors as presents (M.S.S 1721). It can be seen that Emperor Kangxi was fond of the glassware made in China, and innovations in glassware from the Venetian style were integrated into Chinese glassmaking.

As can be seen by examining the composition (Table 1) of Ming porcelain (Xiong et al. 2014), lattimo glass (Verità 2021), and Qing opaque white glass (Yang 1990), the recipe of lattimo glass is more similar to that of Qing opaque white glass in China. Lattimo glass from Murano is mainly a soda-lime-silica glass or lead-silica glass. Soda-lime-silica glass is mainly composed of sodium (Na_2O), calcium (CaO), and silicon dioxide (SiO_2), and the SiO_2 content in opaque glass is higher than that in lattimo glass. Considering that the chemical properties of SiO_2 are very stable, Qing opaque white glass was stronger and more resistant to corrosion. Moreover, tin oxide (SnO_2) accounts for 15% of lattimo glass, while there is no SnO_2 in Qing opaque white glass. SnO_2 is commonly used to make lattimo so that it would look like porcelain (Verita and Biron 2015). However, in Qing opaque white glass, arsenic trioxide (As_2O_3) plays a significant role in opaqueness. The recipe of Qing opaque white glass was an improved version of the Western glass recipe, according to records (Yang 1983), taught by the Western missionaries Ji Wen 紀文 (Gabriel-Leonard de Brossard) and Tang Zhizhong 湯執中 (Pierre l'Incarville). Nevertheless, there exist discernible disparities in the composition between lattimo glass and opaque white glass produced during the Qing Dynasty, casting doubts on whether there was any semblance of imitation in the reciprocal exchange of techniques. Nonetheless, a plethora of similarities can be observed in the texture, color, and pattern of the glass.

Table 1. Mean chemical composition comparison (wt %).

Dating	16th Century	16th Century	18th Century
	Ming Porcelain	**Lattimo**	**Qing Opaque white Glass**
SiO_2	71.18	49.0	64.91
Al_2O_3	15.22	1.0	0.54
Na_2O	2.70	16.5	3.90
K_2O	5.28	2.2	15.34
MgO	0.60	0.8	0.13
CaO	2.36	2.3	2.03
Cl	\	0.65	\
TiO_2	0.09	0.03	\
Fe_2O_3	1.17	0.25	0.11
MnO	0.10	0.05	\
SnO_2	\	15.0	\
As_2O_3	\	\	2.28
PbO	\	12.0	4.57
B_2O_3	\	\	2.59

Meanwhile, with the ever-closer contacts between Western missionaries and the Qing Dynasty, the development of glass also reached its peak during the Qing Dynasty (1636–1912) as missionaries brought Western painting techniques to China. In addition to Western imports, local production of glass also existed in China. During the Qing Dynasty period, the glass industry flourished in Boshan, located in Shandong Province, and Guang-

zhou, located in Guangdong Province (Gan 2021, p. 106; Gong and de Divitiis 2023). Emperor Kangxi (1662–1722) was renowned for his fondness for glass (Yang 1983), and he had a penchant for incorporating exotic elements into the decorative patterns of glass to enhance its creativity. During the reign of Emperor Yongzheng (雍正) of the Qing Dynasty (1722–1735), Jesuit painter Niccolo Tomacelli, at the emperor's request, participated in the design of enamel products at the royal glass factory (Curtis et al. 2004, p. 56). Earlier, Italian missionary Lang Shining (1688–1766) combined the aesthetic tastes of China and Italy in his painting, offering fellow missionary Tomacelli advice regarding painting in enamel. Indeed, the concept of perspective in Western painting began to appear on the motifs of glass snuff bottles (Figure 4) during the Qing Dynasty. Specifically, as depicted in Figure 4, while the visual effects of Chinese ink painting are still preserved in style, the composition manifests a sense of depth through the placement of the vase and rock. Contrary to the scattered-point perspective commonly adopted in Chinese ink painting, a focal-point perspective is evident in the snuff bottle, resulting in a perceptible depth of field. During the Qing dynasty in China, Jesuit missionaries introduced Western painting techniques to Chinese artisans, which led to the development of a unique Chinese style of glass painting. The Chinese artisans blended Western and Chinese aesthetics in their glasswork, creating a style that was distinctly their own. This is the embodiment of the exotic style of Qing Dynasty glass. Venetian glass was adopted in China mainly with the intention to learn the recipes and glass enamel decoration techniques involved, but the glassmaking also diversified into imitation of exotic motifs, glass shapes, and recipes from other countries. Owing to the different cultural backgrounds and religious beliefs in Italy and China, China innovated new shapes and patterns based on learning Venetian glass technology, thereby creating a new integration of cross-cultural artistic styles. The aesthetic value became something of value to many people. The amalgamation of Eastern and Western artistic styles is exemplified through the production of diminutive glassware that carries significant connotations. Cross-cultural design not only shaped the values and aesthetic trends held by artisans but also shaped consumers' perceptions of their interaction with the surrounding world.

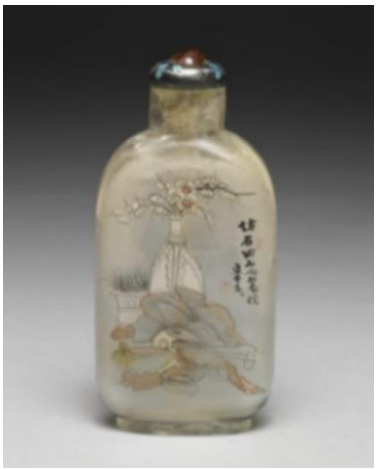


Figure 4. Glass inside-painted snuff bottle with angling decoration (bo li nei hui chui diao tu bi yan hu), Qing dynasty (1644–1911), glass, the National Palace Museum, courtesy of the Taipei National Palace Museum, https://digitalarchive.npm.gov.tw/Antique/Content?uid=63662&Dept=U. (accessed on 15 January 2023).

Therefore, this shows that the influence of the Chinoiserie style was two-way and interactive and was not limited to a single material. On one hand, this interaction resulted in lattimo glass imitating and innovating upon the religious patterns found on Chinese-style porcelain. On the other hand, Chinese glass materials and patterns were influenced by European glassware.

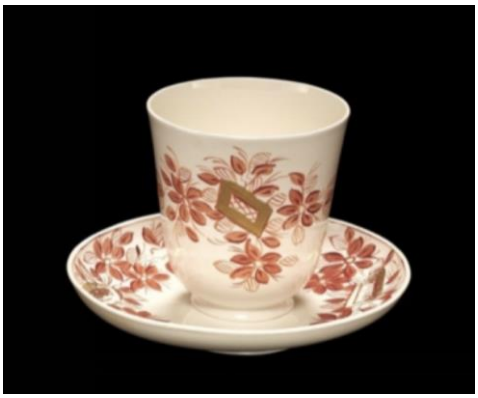
4.2. The Renaissance of Lattimo Glass and Its Contrasts with Qing Dynasty Glass

In the Middle Ages, Venice, as an important trading port connecting Europe and the Far East, facilitated trade between China and Italy. Lattimo glass, after being strictly controlled by the Venetian government from the 16th century onwards, regained popularity only in the 18th century. In the 18th century, Italian glass manufacturers' attempts and innovations in glass formulations also began to gradually influence glass manufacturing in China, providing Chinese glassmakers with more technological possibilities. Lattimo glass epitomized the exchanges between China and Italy, bestowing prestige upon its owners as it traversed cross-cultural networks. The continuous changes and innovations in lattimo glass, as well as the exploration of glass materials, testify to the historical experiences of cross-cultural exchange and cross-language communication.

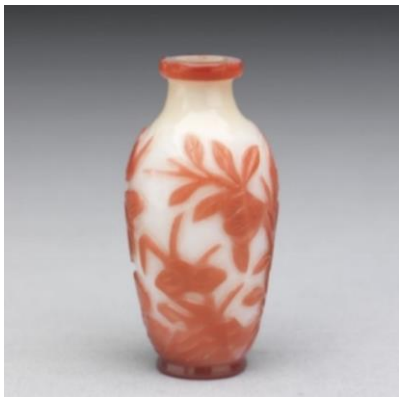
In the 18th century, in addition to the influence of European glass technology on the aesthetic style of Chinese glass, Chinese styles once again influenced the revival of 18th-century lattimo glass. As mentioned earlier, lattimo glass experienced a revival in the 18th century after being suppressed by the Venetian government. During this period of revival in the 18th century, as trade between China and Europe became increasingly frequent, lattimo glass of this era gradually exhibited an aesthetic inclination towards a fusion of Chinese and European styles. We will find that both lattimo glass and Qing red-on-white glass in the eighteenth century (Figure 5) reflect the Chinoiserie style. Although both A-5 and A-6 are classic underglazed (*you li hong* 釉里红) plant motifs, A-6 begins to show the effect of Western three-dimensional influence, while A-5 has a more Chinese ink-painting flavor. Then, with the popularity of Chinese porcelain in Europe and the continually innovative spirit of craftsmen, the early Meissen factory produced imitations of Chinese porcelain (Litchfield 1879). Meanwhile, the Miotti and Bertolini families in Venice began to try cross-material glass creation, specializing in lattimo glassware and cleverly integrating the Western white opaque glass and Chinoiserie elements. Moreover, in 1739, brothers Gio Andrea and Pietro Bertolini acquired the exclusive rights for the production of lattimo glass with gold decorations (Zecchin 2014), and the Miotti family, with a factory on the island of Murano, enjoyed a reputation as remarkable glassmakers with extensive ability in lattimo glass (Charleston 1990). Most of their glassware carried a logo on the bottom for identification, and they excelled in lattimo glassware painted in red monochrome, again in imitation of Chinese porcelain, as shown in Figure 6. This indicates that in the 18th century, the influence of exotic religious factors gradually began to diminish. The aesthetic differences brought about by different religious beliefs started to transform into a symbolized aesthetic consciousness, becoming a decorative medium for expressing the exotic charm of glass. During this period, glass practitioners in China and Italy started to reconfigure foreign religious patterns by combining their own aesthetic preferences and religious beliefs. This led to the emergence of innovative fusion characteristics in the decorative patterns of glass. The cross-cultural dissemination of glass recipes and the re-innovation by local glass craftsmen revitalized this heritage.

The characteristics of the traditional Chinoiserie style are rooted in Eastern religious traditions such as Buddhism or Taoism, emphasizing inclusive and implicit pattern backgrounds. In contrast, European glass manufacturing patterns primarily focus on the objects themselves and the portrayal of mythological figures or scenes. In the face of such cultural differences, it is likely that the interactions among traders, technical personnel, and missionaries maintained and innovatively reinterpreted these cross-cultural aesthetic orientations, thus giving rise to new creations. Cross-regional trade was a bridge for glassware to stimulate interactions between China and Italy. Chinese porcelain, introduced through trade, influenced the creation of Venetian Murano glassware. Qing dynasty glass did not merely copy the typical colors and decorations of Venetian glass but modified functions, materials, and designs to meet Chinese needs and aesthetic preferences. Chinese glass craftsmen assimilated Western glass manufacturing and molding technologies, combining them with traditional methods, forms, decorations, and styles. They retained the technical advantages of Western glass while introducing distinctly Chinese features, re-

sulting in a series of exotic glass products. The invention and appearance of Chinese glass during the Qing dynasty and lattimo glass in Italy transcended the meaning of trade itself, becoming bridges of knowledge and technology for cross-cultural communication, artistic creativity, and practicality. This kind of cross-cultural design training allowed Chinese and Italian craftsmen to conceive of interesting combinations, through which the emblematic function was expressed in forms and decorations that imitated the Chinese style or white porcelain effect. The cultivation of a heightened awareness of painting and art may have played a crucial role in facilitating cross-cultural exchanges between China and Italy. This exchange, in turn, has extended into cross-cultural design, giving rise to new glass artifacts based on the religious beliefs and cultural aesthetics of each respective country.



(**A-5**)



(**A-6**)

Figure 5. Contrast of motifs between lattimo glass and Qing glass in the 18th century: (**A-5**) Teacup and Saucer, Vezzi, Francesco Maker, no.79.3.287, 1720–1724, Italy, Venice, lattimo glass, Corning Museum of Glass, courtesy of Corning Museum of Glass, www.cmog.org; (**A-6**) Red-on-white glass overlay snuff bottle with a floral design (bai tao hong bo li hua hui bi yan hu), Qianlong reign (1735–1796), Qing dynasty, glass, the National Palace Museum, courtesy of the Taipei National Palace Museum, https://digitalarchive.npm.gov.tw/Antique/Content?uid=69028&Dept=U. (accessed on 15 January 2023).

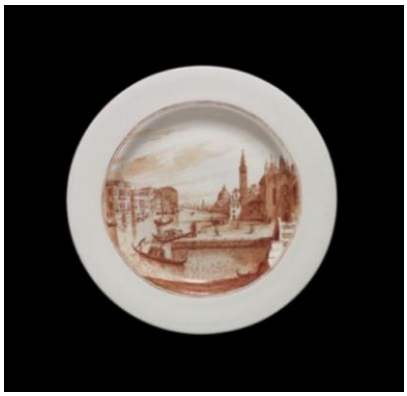


Figure 6. Plate, Miotti Family, no. 79.3.332, 1741, Italy, Venice, lattimo glass, Corning Museum of Glass, courtesy of Corning Museum of Glass, www.cmog.org. (accessed on 16 January 2023).

After going through a phase of purely imitating religious motifs from Chinese porcelain, lattimo glass gradually began to find its own style. The patterns of lattimo glass gradually evolved into a harmonious development that combined European and Chinese styles. Although it may appear as a concentrated manifestation of two distinct religious cultures on the same vessel, it primarily emphasizes aesthetic elements. The Rites Controversy fostered cautious attitudes towards the transmission of different religions across regions.

However, religious motifs gradually integrated into foreign contexts through the deepening of cross-regional trade, becoming visual elements of exotic styles.

5. Conclusions

In summary, this paper has examined the interaction between Chinese and Italian glass art design, considering the incorporation of design issues and religious factors to provide a comprehensive perspective on cross-cultural artistic interactions from the 15th to the 18th centuries. Through close maritime trade links, the exchange of glass and ceramic technologies between China and Italy facilitated the creation and dissemination of lattimo glass from this period. By examining the religious motifs present in lattimo glass, it becomes apparent that the Rites Controversy imposed limitations on the mutual influence of Eastern and Western religions. However, the frequent exchange of trade between the East and West led to a complex intermingling of Chinese-style religious elements with Italian religious elements. This intricate fusion resulted in different religious traditions from various countries gradually taking the form of graphic elements, thereby developing into a unique exotic aesthetic style. The dissemination of these religious motifs primarily occurred under the influence of aesthetic factors, allowing religious patterns to be presented on vessels as part of decorative aesthetics. As a result, it garnered appreciation from diverse religious and cultural communities. With the fusion of culture, art, and practical technology, glassware underwent innovative redevelopments over time. By serving as a carrier of two heterogeneous cultures, lattimo glass fostered a cross-cultural contact relationship between the arts of China and Italy.

This study demonstrates the adaptability of cross-cultural design in lattimo glass, harmonizing with the local religious beliefs, aesthetics, and practicalities of China and Italy. Essentially, the developmental process of lattimo glass represents the direct material embodiment of the aesthetic patterns, craftsmanship, and design intentions of glass vessels with Chinese-style religious aesthetics. Like other exotic materials in Europe, lattimo glass in Venice garnered cross-cultural esteem as an appropriated exotic object. The transformation of glass from a precious gift to a commodity for cross-cultural exchange between China and Italy highlights the aesthetic differences and novel pursuits of craftsmen from both cultures.

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