

A Case Study of Sino-French Art Exchange in the Late 17th Century: A Comparison of Dome and Caisson Ceiling

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Abstract. In the 17th and 18th centuries, the Opening of the New Sea-route sparked a surge of Sino-Western fever in Europe, leading to close exchanges of Chinese and Western art and culture. Traces of mutual influence can be found in painting, decoration, furniture, and patterns. This article compares the seemingly similar caisson ceiling of the Wanchun Pavilion in China and the dome of the Invalides Church in France to further explore the possibility of mutual architectural borrowing between China and the West during this unique era based on the theory of cross-cultural communication. While the novelty of exotic styles can be particularly captivating, the exchange and collision of Eastern and Western cultures at this time was not about plagiarism, but rather mutual inspiration, learning from each other's strengths while incorporating their own unique characteristics, thus forming new artistic thoughts.

Keywords: Chinoiserie, dome, caisson ceiling, communication

1. Introduction

When it comes to French architecture, which style fascinates you the most? For me, the Baroque and Rococo periods are the most appealing. In the exquisite and luxurious Palace of Versailles, I was immediately captivated by the objects of Chinese features. When I learned more about this special period of Chinoiserie, I realized that Chinese characteristics can be found in European paintings, decorations, culture, etc. However, art is not just imitation. The exchange and collision of Eastern and Western cultures is not plagiarism, but mutual inspiration. Learn the principles and artistic ideas, integrate the characteristics of one's own nation, and thus form a new artistic style.

During the 17th and 18th centuries, Chinese style interior design swept across Europe at lightning speed. The influence of Chinese culture on European art was first reflected in the field of arts and crafts. As early as the reign of Louis XIV, he ordered the construction of the famous Trianon Palace in the Palace of Versailles to display his porcelain collection. Despite the significant progress made in painting and silk products of the chinoiserie, a critical gap exists in our understanding of the communication between eastern and western architectures. Motivated by this aim, I will exam the Chinese caisson ceiling and France's dome in depth. A thorough understanding of these architectures is pivotal in shaping effective strategies for cultural communication of art.

Cross-cultural communication theory was first introduced by the American anthropologist Edward T. Hall in the 1950s. His book, *The Silent Language*, established the basic framework of this field. The theory considers cultural exchange as a two-way process. This process involves not only acceptance, transformation and integration, but also conflict at times. Cultural differences do not

appear only in language. Architecture, art, etiquette, and clothing also function as important media of cross-cultural communication.

We will examine the historical context and social life of the time, drawing on theories of cross-cultural exchange, to understand why two seemingly similar dome-shaped structures emerged in the East and West at a time when transportation was far less advanced than it is today. Then, by analyzing the structures, interior decoration, and similar national strengths, we discover similarities between the two. Differences in architectural function, building materials, religious beliefs, and culture highlight the complexity of cultural exchange.

2. Color system

Before direct trade between France and China, French royalty and scholars learned about China through books like *Matteo Ricci's Letters on China* and *Notes on China*. In 1685, Louis XIV, seeking to enhance France's international influence in mathematics and astronomy, dispatched five Jesuit missionaries to China, led by Joachim Bouvet (1656–1730). He hoped to gain the trust of the Qing rulers and further expand Sino-French trade.

As Sino-French trade grew increasingly close, the two countries exchanged and learned from each other in art and culture, thus ushering in an era of Sino-French enthusiasm in France. During this period, Chinese features can be found in French paintings, decorations, furniture, and patterns. The dome of the Invalides (see figure 1), built between 1679 and 1706, and the caisson ceiling of the Wanchun Pavilion (see figure 2), built in the Imperial Garden in 1536 (the 15th year of the Jiajing reign of the Ming Dynasty), share some similarities in structure, form, decoration, and construction. This corresponds to the cultural input link in the theory of cross-cultural communication, which promoted trade between the two countries through missionary diplomacy. Chinese decorative patterns, porcelain, lacquerware, and silk fabrics began to enter the European market, and Chinese cultural ideas, philosophical ideas, and aesthetic ideas also entered the Western field of vision through the biographies of missionaries.



Figure 1. The interior of the dome (vertical view) with its two superimposed painted domes [1]



Figure 2. The coiled dragon at the center of the Wanchun Pavilion caisson ceiling [2]

2.1. Gold: the royal family's unique choice

Louis XIV consistently adhered to the principle of the divine right of kings throughout his reign. During that time, he continuously strengthened centralization, using various measures to establish France as the dominant power in Europe. He centralized the entire French bureaucracy around his palace, Versailles, in an effort to further strengthen the king's military and financial power.

The same was true of Kangxi. He reigned for 61 years, the longest in Chinese history. In the early years of his reign, despite dire domestic and international tensions, he persisted in deploying large-scale military forces to ensure the integrity and unity of the country. Politically, Kangxi, like Louis XIV, strengthened centralization of power. To unite more powerful forces to his advantage, he implemented benevolent policies. At the same time, he also took steps to recuperate and develop the economy after the war. The two emperors had very similar experiences in their youth. Therefore, after the opening of the new sea route, they exchanged letters with the help of missionaries such as Jean-Baptiste du Chauvin. Louis XIV once wrote to Emperor Kangxi about his life [3].

Gold became an exclusive color of the royal family during the Tang Dynasty, where it symbolized imperial authority. While in the Baroque period, gold carried a sense of mystery and solemnity. Architects often used it in royal and religious buildings to express the supremacy of monarchy and the uniqueness of religion. The gilded dome of the Invalides Church functions as both ornament and symbol. It represents royal authority and divine power [4]. Furthermore, Louis XIV was known as the "Sun King." He adopted this title after portraying the sun god Apollo in a court ballet. The gold color of the dome, therefore has political meaning which reinforces the image of the French monarch as a radiant and supreme ruler.

2.2. Other color with cultural meaning

In the caisson ceiling, the supporting structure between the windows is red, while the outer surface of the phoenix pattern is entirely green, as are the "Xuan zi" structure (see figure 3) and other decorative structures. Red and green are very common colors in ancient Chinese architecture. Daoist notion that "Purple *qi* comes from the east"¹, implying that auspicious air-cosmic energy comes from the east. Moreover, *Wuxing* is associated with five colors and orientations: red represents fire corresponding to the south; green represents wood corresponding to the east; black represents water corresponding to the north; white represents gold corresponding to the west, and yellow represents earth corresponding to the center [5].

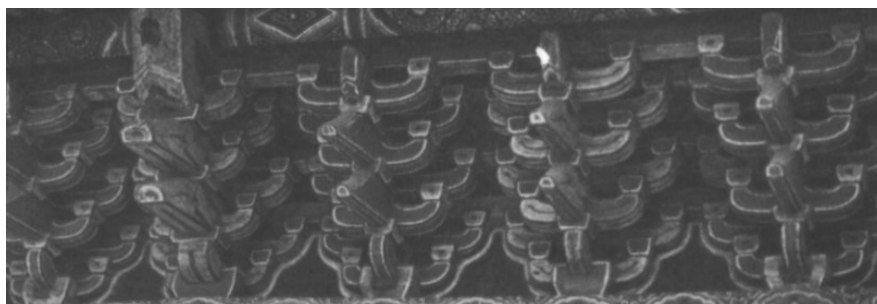


Figure 3. External eaves spiral painting, from *Qing-style Construction Rules* (No. 65) [6]

In China, red has long been regarded as an auspicious color. People associated it with good fortune and positive energy. In feudal society, the ruling class extensively employed red in royal architecture and temples as a visual symbol of supreme authority and noble status. Builders painted pillars and beams red to ward off evil and to ensure peace. However, green carries a different meaning. On the one hand, it represents wood in traditional Chinese cosmology; on the other hand, Chinese architecture relies heavily on wooden structures. As a result, green suggests harmony with nature. It creates a calm and tranquil atmosphere for the viewer.

The spatial band of the dome is rendered in white and the supporting structures and the decorative areas between the windows also follow this color scheme. In Western tradition, church domes are

¹ "Purple *qi* comes from the east " in chinese is 紫气东来.

regarded as sacred and timeless forms. They function as visual symbols of heaven and signify holiness and purity. The reflection of light across the white surfaces strengthens this symbolic meaning while the open and luminous space reinforces a sense of transcendence. As a result, worshippers experience the church as mysterious and sacred. This visual effect also intensifies the solemn atmosphere of religious rituals.

The circular dome structure symbolizes perfection and heaven. The dome therefore holds a central place in church architecture. The white decorative areas between the windows reflect sunlight, and the interior space becomes brighter and more refined. This light appears almost divine in character. Consequently, worshippers may feel that God's presence reaches each individual. The church thus functions as a sacred space for understanding the truth of the Gospel. In Christian belief, the church is the place closest to God. It represents God's glory and Christ's temple and also serves as a visual anticipation of heaven. For this reason, sacred colors such as white and gold are considered most appropriate.

In terms of architectural color, both buildings feature gold. While the meanings they convey vary, both are fundamentally connected to imperial power and symbolism. Furthermore, in terms of other color schemes, white in dome symbolizes purity and holiness, while red and green also hold special meanings in Chinese architecture. These colors each possess regional characteristics and unique symbolic meanings. In this regard, in terms of color choice, the two buildings share certain similarities.

Edward T. Hall proposed the concepts of high-context culture and low-context culture [7]. For example, Chinese architecture relies on symbols, metaphors, and symbolic systems, making it a high-context culture. European countries, on the other hand, tend to use geometric structures, rational order, and logical expression, making them low-context cultures. Hofstede proposed that cultural differences can be analyzed through dimensions such as "power distance," "uncertainty avoidance," and "collectivism." [8] Chinese architecture, with its strict spatial layout and clear axes, symbolizes centralization and social harmony. French Baroque architecture, through its dome-shaped structure, creates visual order, emphasizing the concept of divine right of kings. In this regard, while the two differ in architectural form, they both use architectural form to reinforce social power structures and spiritual beliefs. This is a typical phenomenon of "functional equivalence but formal heterogeneity" in cross-cultural communication.

3. Light and its psychological effects

In cross-cultural communication, architecture not only carries the dissemination of form and style, but also conveys the "worldview model" of different civilizations. Even in two completely different countries, their outstanding architecture shares many similarities. The Wanchun Pavilion is a large, square-shaped pavilion with brackets, embodying the rounded top and square bottom. Ma argues that the lower eaves of the Wanchun Pavilion have three bays on each side, with a central porch... The porch and the lower eaves of the square pavilion are parallel and interlaced, with four groups of twelve wing corners rising outward [9]. These twelve wing corners correspond to the 12 windows in the caisson ceiling, allowing sunlight to illuminate the entire ceiling and add a sense of sacredness.

Although the dome of the French Invalides Church is not a structure with a round sky and a square earth, the architect also designed it into four equal parts according to the conditions of the building. Each part contains three windows and three ceiling paintings. "It consists essentially of four large elements and four smaller chapels encircling a relatively small central wall, the entrance to the former being twice as large as those to the latter... Hardouin Mansart made a twelve-part internal division, placed four piers on the four external axes and unified the whole with twelve ribs on the dome" [10].

These two buildings have four large elements, each element contains three other smaller elements, and are finally divided into 12 parts equally. This coincidence allows us to feel that even if beautiful things look diverse, we can still find similarities after careful examination.

Secondly, looking at the overall architectural layout, the Wanchun Pavilion's caisson ceiling is roughly composed of a central circular well, followed by a circle of double-bird patterns, and then 12 windows in the outer circle. The dome of the Invalides in France is similar: a large circular ceiling painting in the center, followed by 12 smaller ceiling paintings as decoration, and also 12 windows further out. Their architecture shares certain similarities, which to some extent suggests that the two buildings may have borrowed and learned from each other during the period of artistic creation in China.

In ancient China, the calendar divided the year into twelve months according to the phases of the moon. This system relied on the Twelve Earthly Branches. These branches expressed a cosmic order. In architectural decoration, the number twelve represented not only the full cycle of time, but also the harmony and perfection of heaven and earth. The caisson ceiling of the Wanchun Pavilion contains twelve windows (see figure 4). These windows form a circular arrangement, and the circle suggests the continuity of time. Light enters through the openings and moves across the interior. The repeated circular pattern creates a subtle sense of mystery. This effect evokes an image of heaven, thereby enhancing the aesthetic appeal of the pavilion, which once served the imperial family and the aristocracy.



Figure 4. The twelve windows of the Wanchun Pavilion caisson [11]

What's more, Buddhism also teaches the "Twelve Links of Dependent Origination." This doctrine stresses the endless chain of cause and effect. Architectural design often reflects this idea through circular and concentric layouts. The central space symbolizes liberation and the attainment of nirvana. The surrounding windows represent the stages of samsara. The division of the structure into twelve equal sections corresponds to each link in the causal chain, and the architectural form gives the teaching a clear spatial order.

4. The symbolic meaning of the image

4.1. Dragon and emperor power

Zhou found that the ancients believed that the dragon possessed the ability to ascend to heaven and descend into the abyss, summon wind and rain [12]. It possesses an omnipotent power and represents a certain supernatural power. Within the Forbidden City, the dragon has long been a symbol of the emperor and a symbol of his power. The dragon at the center of the Wanchun Pavilion's caisson ceiling is small but majestic. Its eyes piercing, horns erect, whiskers swirling in the air, body intertwined and coiled, creating a formidable presence and adding to the overall majestic presence of the relief.

When light shines through the windows onto the center, the golden color of the dragon's eyes appears particularly dazzling, making the entire relief look lifelike. The emperor's unwavering

majesty is heightened by the light, and the golden color imbues the light's arrival with a sense of sacredness. This sense of sacredness stems not only from the complex craftsmanship of the architecture itself, but also from the symbolic significance of the dragon, a totemic symbol unique to the Chinese nation.

4.2. Christ and political representation

In an effort to promote Catholic compassion and attract more men to the military, in 1670, he commissioned the construction of a building specifically for veterans and those disabled by the war. The centerpiece of the dome was created by Charles de la Fosse between 1702 and 1705. The entire ceiling painting is circular with a background of a clear blue sky and white clouds, giving the work a sense of being close to the heavens. The theme of each painting (see figure 5) is Saint Louis presenting his victory over his enemies to Christ. According to the Web Gallery of Art, this is "a theme which combines Louis XIV's new religious enthusiasm with the veneration for his great ancestor, who is depicted in royal robes and in the likeness of the donor. La Fosse has based his design on Correggio, but he has greatly lightened his model by putting all the figures near the edge of the circle and so leaving the middle of the field for the open sky" [13].



Figure 5. St Louis Presenting to Christ the Sword [14]

Louis XIV drew on France's Christian tradition to associate himself closely with Christ. This strategy narrowed the distance between royal authority and the people thus allowing the king to govern more effectively. The approach also expressed his respect for his ancestors. It encouraged the public to view him as compassionate and righteous. The murals commissioned by Louis XIV reflected his political and religious intentions. La Fosse emphasized France's military victories and praised the courage of its soldiers. Yet his goal extended beyond the celebration of war. He used symbolic imagery to link Saint Louis, Christ, and Jesus with the French monarchy.

Whether it's the caisson ceiling of China's Wanchun Pavilion or the dome of France's Les Invalides, while the central ceilings of these buildings depict different themes, both are connected to the identities of their respective nations and nationalities, and each bears its own political purpose and governing philosophy. The Chinese dragon element is meant to express the emperor's supremacy and majesty. The French Christian element better integrates religious belief with state governance, using religion to draw closer to the people. While the Chinese caisson ceiling and the French dome may not be directly related in appearance, their artistic concepts and creative objectives share similarities. From the perspective of cross-cultural communication theory, the difference between these two architectural forms reflects the differences in cultural encoding and decoding: different cultures "translate" world order, power structures and spiritual beliefs into visible symbolic systems through architecture.

5. Building material and pattern

The Wanchun Pavilion's caisson ceiling features a multi-layered wooden frame structure. The ingenious ancient Chinese utilized rivers to transport timber, saving manpower and resources. Furthermore, wood doesn't require advanced tools for felling and processing. Secondly, wood is used to construct beams, brackets, and other structural elements. These are essential load-bearing components in traditional Chinese caissons. Wood is typically a durable hardwood, lightweight, and easy to process. Thirdly, China has long used tenon-and-mortise joints (see figure 6). This structure is removable, making it quick to replace damaged items or rebuild, making it highly sustainable. Taoist philosophy advocates conforming to nature and achieving harmony between man and nature. All things in nature are alive, and even in architecture, care must be taken not to harm nature but to coexist harmoniously with it.

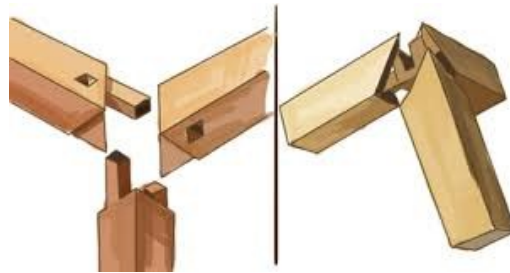


Figure 6. Tenon-and-mortise joint [15]

The walls and columns of France's Invalides are constructed of stone, while the framework supporting the dome's interior is constructed of wood. The outer dome is constructed of oak trusses, covered with lead sheets and gilded, creating the famous "Golden Dome." This double-layered dome design, with a wooden outer layer and a stone inner layer, reduces weight and increases stability.

Some say that Chinese stone buildings are for the deceased, while Western stone palaces are for the gods. This view has some truth to it. Chinese wooden architecture emphasizes harmony with the natural environment, adapting to nature and pursuing sustainable development. Western stone architecture, on the other hand, relies on high walls, largely isolating humans from direct contact with nature. Instead, windows are used to allow light in, hoping that people will find salvation in the light that streams into the church. This, in itself, is somewhat misplaced.

The building materials of the two domes are slightly different, and the patterns used to decorate the buildings also differ from each other. The Wanchun Pavilion's caisson ceiling features a green branch carved from black grass with forked corners and gold-carved black phoenixes (see figure 7). As early as ancient mythology, the phoenix was considered a beautiful and mysterious bird, possessing clairvoyant powers, understanding the universe, humans, and gods, and possessing magical abilities [10]. Like the dragon, the phoenix symbolized the supremacy of imperial power.



Figure 7. Wanchun caisson ceiling of green-branch carving with forked corners and gold-carved black phoenixes [16]

The dome of the Invalides in France also has 12 ceiling paintings. Although each painting depicts a different subject, they can still be seen as a decorative pattern used to highlight the theme. There are five golden reliefs between every two apostle ceiling paintings, making the entire dome look more sacred and inviolable.

Judging from the decorations of the two buildings, although the patterns and contents are not exactly the same, they are both related to the culture and religion of their own country and nation. They are both intended to set off the most central main building part to deepen its connotation and strengthen the main theme. As the theory of cross-cultural communication tells us, cultural exchange has its own special complexity. Cultural interaction makes art look brand new and generates new vitality.

6. Inspiration and reflection

In today's society, with the continuous advancement of science and technology, more and more skyscrapers are rising in cities, many of which are monotonous and identical. It often feels like cities are essentially the same: massive concrete monstrosities, devoid of their uniqueness and cultural identity. The pursuit of economic development has led to a neglect of the in-depth exploration and preservation of local culture. This not only threatens to rob urban residents of their sense of belonging and diminish their enjoyment of life, but also undermines the inheritance and development of culture, leading to cultural poverty.

In China, many cities have constructed modern versions of ancient city structures to enhance their cultural heritage. These buildings are deliberately artificial, with designers failing to consider their adaptability to the city and their relationship to the surrounding natural environment. They just simply copying and imitating. The result is a massive investment of manpower and financial resources in the construction of a nebulous architecture. Many projects have been driven from the outset by commercialization, gradually dehumanizing cities and architecture.

The dome of the Invalides church in France is a product of the chinoiserie era in Europe. While its architecture may have drawn inspiration from Chinese architecture, it didn't completely copy it. Instead, it extracted its essence and cleverly incorporated it into its own design. While actively absorbing foreign cultures, it also kept its own culture in mind, continuously developing it and organically integrating local culture with the world.

Furthermore, Fei Xiaotong once said, "Each one appreciates its own beauty, each appreciates the beauty of others, and all beauty is shared, leading to universal peace." When constructing architecture, we must not only maintain our own national identity but also engage in exchanges and mutual learning with other people around the world, learning from their strengths. Furthermore, we must not ignore the bond between humans and nature. Protecting nature is protecting ourselves. We must not only consider the harmony between architecture and nature, but also, whenever possible, select sustainable materials to maintain ecological balance.

The Wanchun Pavilion's caisson ceiling and the dome of the Invalides Church in France are both architectural treasures that shine brightly throughout history. Through the above analysis and comparison, we can conclude that the two structures share certain commonalities. Their greatness lies in the fact that when Chinese culture and art first entered the French consciousness, artists did not simply copy them. Instead, they embraced the strengths and advantages of other cultures, allowing the exchange and collision of Eastern and Western cultures to become mutually inspiring. Contemporary artists should also draw upon their own cultural heritage when creating art, avoiding the tendency for form to trump function and reducing architecture to mere visual goods. At the same time, they should prioritize the sustainability of artistic creation, embracing nature rather than opposing it, and striving to maintain harmony with nearby buildings and the urban environment. Only in this way can architecture truly become an organism that carries cultural memory and the spirit of

the times in the context of globalization and achieve a deep dialogue between tradition and modernity, East and West, thus allowing artistic value to continue to grow on the basis of respecting differences. The "fusion" of Chinese and Western architecture is not a simple imitation of form, but rather a process of "cultural reproduction" achieved through the interaction of aesthetics, politics, and knowledge. This interactive mechanism not only reflects the complexity of cross-cultural exchange, but also reveals the multiple functions of architecture as a symbol of power and identity.

References

- [1] Wikipedia. Hôtel des Invalides. Available at: https://fr.wikipedia.org/wiki/H%C3%B4tel_des_Invalides (accessed August 29, 2025).
- [2] Toutiao. The coiled dragon in the Wanchun Pavilion caisson ceiling. Available at: https://www.toutiao.com/article/7542530395548467753/?channel=&source=search_tab (accessed August 29, 2025).
- [3] Ji, R. "Kangxi Emperor and the Sun King Louis XIV: The Encounter of Chinese and French Cultures." *The National Palace Museum Monthly of Chinese Art*, no. 343 (2011): 31.
- [4] Musée de l'Armée. (n.d.). The dome church of Les Invalides [PDF]. Retrieved August 29, 2025, from https://www.musee-armee.fr/fileadmin/user_upload/Documents/Support-Visite-Fiches-Objets/Fiches-periode-louis-XIV/dome-presentation-GB.pdf (accessed August 29, 2025).
- [5] Zhang, L. "Cultural Symbols in Chinese Architecture." *Architecture and Design Review* 1, no. 1 (2019): 1-18.
- [6] Liang, S. *Qing-style Construction Rules*. Beijing: Tsinghua University Press, 2006.
- [7] Hall, E. T. *Beyond Culture*. New York: Anchor Books / Doubleday, 1976, pp. 91-102.
- [8] Hofstede, G. *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations across Nations*. 2nd ed. Thousand Oaks, CA: Sage Publications, 2001, Chapter 3, pp. 79-140.
- [9] Ma, B. *Traditional Chinese Architectural Carpentry Techniques*. 2nd ed. Beijing: Science Press, 2003, pp. 86, 256.
- [10] Braham, A. J. "L'Eglise du Dôme." *Journal of the Warburg and Courtauld Institutes* 23, nos. 3-4 (1960): 216-224. <https://doi.org/10.2307/750592>
- [11] Palace Museum. Wanchun Pavilion Panorama. Retrieved from https://pano.dpm.org.cn/#/panorama?panorama_id=63&scene_id=3348&scene_name=scene_3348_summer (accessed August 29, 2025).
- [12] Zhou, Q. *Divine Beasts in the Forbidden City*. Shanghai: Shanghai People's Publishing House, 2024, pp. 2-31.
- [13] Kren, E., & Marx, D. (Eds.). (n.d.). Web Gallery of Art. Retrieved September 11, 2025, from <https://www.wga.hu/index1.html> (accessed August 29, 2025).
- [14] Web Gallery of Art. St Louis Presenting to Christ the Sword. Available at: <https://www.wga.hu/support/viewer/z.html> (accessed August 29, 2025).
- [15] China Youth Network. Tenon-and-mortise joint. Available at: https://qnzs.youth.cn/tsxq/201809/t20180904_11716744.htm (accessed August 29, 2025).
- [16] Palace Museum. *Interior Decoration of the Forbidden City Architecture*. Beijing: Zijincheng Press, 2007.