

The Development of Decorative Art in Lingnan House Garden in Macau — Taking Lingnan Oyster Shell Window and Manchuria Window as Examples

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Abstract—In today's society, along with the rapid development of economy and urbanization, the arrival of the new industrialization era and the era of big data, many traditional cultures have been affected, including intangible heritage and cultural sites. This paper analyzes the architectural art of the Mandarin's House, Casa Lou Kau Mansion and folk houses of Rua da Felicidade in Macau, analyzes the inheritance and development of the Lingnan Oyster Shell Window and Manchuria window in Macau, and summarizes the suggestions for the protection of urban heritage culture from the perspective of scholars.

Keywords—Lingnan house garden; Lingnan oyster shell window; Mandarin's House; Manchuria window

I. INTRODUCTION

Macau, located on the west bank of the Pearl River Delta, is the southern part of Lingnan culture. There are not many existing Chinese-style houses. The famous ones are Casa Lou Kau Mansion and Mandarin's House. They all have the distinctive expression of the Lingnan Garden genre, and they also have the western style of the Portuguese colonial era is unique in its artistic style.

At the same time, Mandarin's House and Casa Lou Kau Mansion is also part of the eight former buildings that make up the 22 buildings in The Historic Centre of Macau (Macau Historic Buildings). It is also the largest residential complex in Macau and it was included in the World Cultural Heritage List by UNESCO in 2005. The unique Lingnan architectural decoration art preserved by Mandarin's House and Casa Lou Kau Mansion are the few cases in which Macau is studied.

Through the analysis of historical documents and records of field visits, this survey aims to compare and analyze the inheritance and development of the Lingnan architectural decoration art in Mandarin's House and Casa Lou Kau Mansion by analyzing the historical origins, architectural art and current situation of Macau Mandarin's House. In summarizing its spatial layout, talking about the current status of repair and maintenance and future prospects, it has led to the thinking of the protection of historical and cultural heritage, and at the same time stimulated the public's

attention to the few well-preserved Lingnan house garden in Hong Kong and Macau.

II. LINGNAN OYSTER SHELL WINDOW

A. The Origin of the Lingnan Oyster Shell Window

Oyster shell window (as shown in "Fig. 1"), also known as Clam shell window, is a kind of window made by grinding the shell of shellfish such as Clam shell to make it thin and bright in ancient Chinese folk, it is a sort of glass substitute. That is, people processed oyster shells into thin slices and woven bamboo into windows to let in light, so it is also known as oyster shell windows. "Mr. Dongye" fifth of Xu Dishan: "A crippled oyster shell window was supported by a bamboo pole covered with mud." According to historical records, oyster shell window appeared in the Southern Song Dynasty and reached its peak in the Ming and Qing Dynasties.

Although China has a long history of oyster cultivation, it is not easy to taste oysters in inland areas due to the inconvenient transportation in ancient times. Therefore, large families along the coast not only can easily taste oysters, but also decorated their houses with shells, which gradually became a low-key and luxury "flaunt wealth" symbol.



Fig. 1. Lingnan oyster shell window (photo by the author).

B. Overview of the Process of the Lingnan Oyster Shell Window

Oyster shell window is a window made of Marine shellfish shell which is polished into translucent thin slices

and embedded in the wooden frame. It can refract colorful brilliance under the light, and also has the function of warm in winter and cool in summer, the translucent feature also reduces damage caused by direct sunlight from the outdoors into indoor furniture. Therefore, it is mostly used in Lingnan house garden, which is a traditional architectural decoration with regional cultural characteristics in the coastal area of Lingnan area.

Of course, the oyster shell window production process is relatively complex, generally speaking, it can be divided into six procedures:

Process 1: ageing. That is, choose the high-quality Marine Clam shell (oyster shell and other shellfish), storage for a year, aging to remove taste.

Process 2: cleaning. That is, the shell is soaked in water and cleaned repeatedly with a wire brush. It can not only wash the mud and sand on the surface of Li shell, but also brush away the over-aged material on the surface of Li shell and brush it thin.

Process 3: side scrap. That is cutting out a rectangular or square and other different shapes of Clam shell pieces according to the size of the window lattice.

Process 4: split shells. Before installing the oyster shell into the window frame, it is necessary to check the thickness of the Clam shell. If the Clam shell is a little thick, split it thin with a knife (the thinner, the better of the light).

Process 5: washing. That is, put the pieces of Clam shell on the grinding wheel and polish them uniformly. Grind the uneven places on the surface of the Clam shell, so as to get the same thickness.

Process 6: polishing. That is, after polishing, put Clam shell on the polishing machine for fine processing, so that each piece of Clam shell can achieve thin, flat, light effect.

According to statistics conducted by the staff of Guangdong Yuyin Garden, 106 seashells are needed to complete an oyster shell window. And every window can be seen as a whole, if one of the shells is damaged, the whole window needs to be removed and reinstalled. However, because the process of oyster shell window is very tedious, there is no artisan who specializes in making oyster shell window, the material of oyster shell window has not been reproduced, and it has gradually disappeared from the stage of history.

In terms of the whole Guangdong area, oyster shell window is still preserved in the four famous gardens (Journal of Guangzhou Yuyin Garden, Liang garden in Foshan, Qinghui garden in Foshan and Dongguan Ke yuan) of Guangdong in the Qing dynasty. In Hong Kong and Macau, it is preserved only in the Mandarin's House and second floor of the folk houses of Rua da Felicidade in Macau.

It has not only become the "rare" decoration of the architectural art in Lingnan house gardens, but also become the indispensable cultural memory of The Times in Lingnan culture.

C. Application of the Lingnan Oyster Shell Window in Macau

1) *Mandarin's house*: Mandarin's House is one of the few Lingnan mansions in Macau and one of the buildings that make up the historic district of Macau (see "Fig. 2"), a world cultural heritage site.

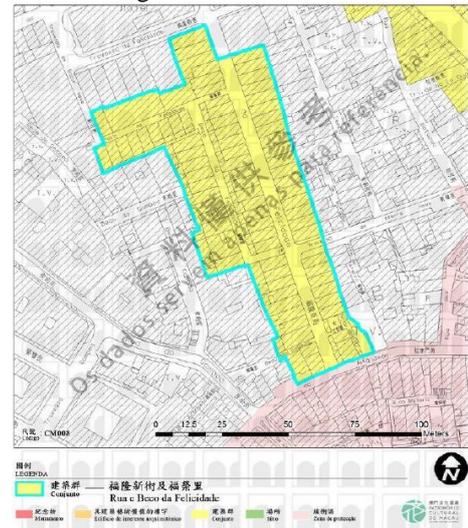


Fig. 2. Location of Mandarin's House (photo by the Macau Cultural Heritage Website <http://www.culturalheritage.mo/gb/detail/98/1>).

Lingnan oyster shell window is the most beautiful decoration in the Yu Qing Mansion and Ji Shan Mansion with the typical Lingnan characteristics. Lingnan oyster shell window is a translucent sheet of Marine shellfish shells, which is inlaid into the wooden frame on the windows. Under the sun, it will reflect the colorful lights. Besides, it is warm in winter and cool in summer, since the characteristics of the translucent can reduce the damage of the furniture that caused by the direct sunlight.

Therefore, it is commonly used in the household of the Lingnan area and it is a traditional architectural decoration with regional cultural characteristics. However, since the making method of the Lingnan oyster shell window is endangered, its materials are hard to find, and the manufacturing process is relatively complex, the Lingnan oyster shell window inside the house looks old and dark, and some of parts are still stained and weathered (see "Fig. 3" and "Fig. 4").



Fig. 3. Lingnan oyster shell window of the Mandarin's House. (photo by the author).



Fig. 4. Lingnan oyster shell window of the Mandarin's House (photo by the author).

2) *Casa Lou Kau Mansion (No. 7 residence of Hall lane)*: Another Chinese building of the world heritage site in the historic district of Macau — Casa Lou Kau Mansion (see "Fig. 5"), has preserved the four oyster shell windows on the external facade. The Casa Lou Kau Mansion is the former residence of the famous Macau businessman and "first-generation gambling king" Lu Huashao (Lu Jiu) family, it was built in the 15th year of Guangxu Emperor of the Qing Dynasty (1889). At that time, Lu Huashao, one of the richest men in the world, also used an oyster shell window with an octagonal pattern on the western facade of his former residence as part of the architectural decoration (see "Fig. 6", "Fig. 7" and "Fig. 8").



Fig. 5. Location of Casa Lou Kau Mansion (photo by the Macau Cultural Heritage Website <http://www.culturalheritage.mo/gb/detail/hrtID66>).



Fig. 6. West elevation of Casa Lou Kau Mansion (photo by the Macau Cultural Heritage Website <http://www.culturalheritage.mo/gb/detail/hrtID66>).



Fig. 7. Appearance of Casa Lou Kau Mansion (photo by the Macau Cultural Heritage Website <http://www.culturalheritage.mo/gb/detail/hrtID66>).

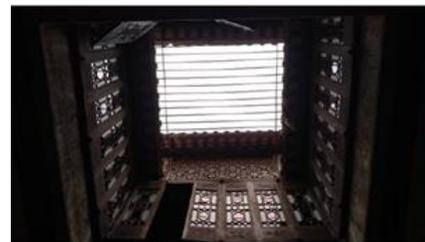


Fig. 8. Lingnan oyster shell window of Casa Lou Kau Mansion. (photo by the author).

3) *Folk houses of Rua da Felicidade*: Rua da Felicidade, an ancient street in the central district of the Macau peninsula, was once the commercial hub of Macau (see "Fig. 9"). During the Tongzhi period of the Qing dynasty (1862-1874), a businessmen with Fujian membership bought the area, by land reclamation and shop building, there were many prostitute houses and tobacco houses, besides bank, wine shop, store and theatre, which formed the former "red light district" in Macau. After Macau and Portuguese government banned prostitution at the beginning of the 20th century, the Macau government implemented the "city improvement plan", which listed the old buildings in this area as key cultural relics and allocated a large amount of money to rebuild them. The original architectural style of the whole street, such as the bright red canopy, windows and doors with flower, has been preserved, and it has become the most walkable street in Macau, where gathers a lot of restaurant, and presents another scene. Today, Rua da Felicidade is one of the cleanest streets in Macau, and has become the prosperous catering business district of Macau.

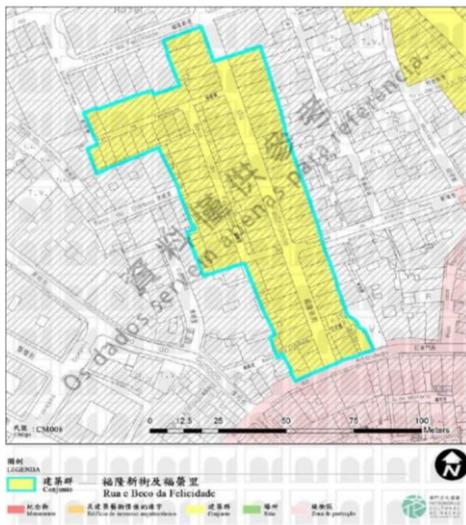


Fig. 9. Location of Folk houses of Rua da Felicidade (photo by the Macau Cultural Heritage <http://www.culturalheritage.mo/gb/detail/90/1>).



Fig. 10. Folk houses of Rua da Felicidade (photo by the author).

Most of the residential buildings in Rua da Felicidade are two-story buildings with similar appearance, with grey walls and red windows, shops on the lower level and residential buildings on the upper level (see "Fig. 10"). All of them are in the form of pitched roof, reflecting the characteristics of Chinese architecture in the 19th century. The windows on the second floor are decorated with oyster shell windows (see "Fig. 11"), with the design of octagonal gold plate.



Fig. 11. Lingnan oyster shell window of Folk houses of Rua da Felicidade (photo by the author).

III. MANCHURIA WINDOW

A. The Origin of Manchuria Window

Manchuria window is windows made of traditional wood frame setting with colored glass etch. Colored glass etch is a practical handicraft combining Chinese and western cultures. It adopts imported glass materials for etching, grinding or

sandblasting. With traditional theme as content, it has the colors such as red, yellow, blue, green, violet, gold, and adds different shape design, which makes the window elegant and beautiful. Later, due to the lack of raw materials and other reasons, this handicraft gradually disappeared.

After 1840, Guangzhou (see "Fig. 12"), as an important treaty port in China at that time, was inhabited by foreign businessmen on Riverside road; and colorful glass was indispensable in western architecture. In dealing with foreigners, Manchurian or businessman found that this kind of colorful glass was very beautiful; therefore, they wanted to improve it into their own high-grade decoration.

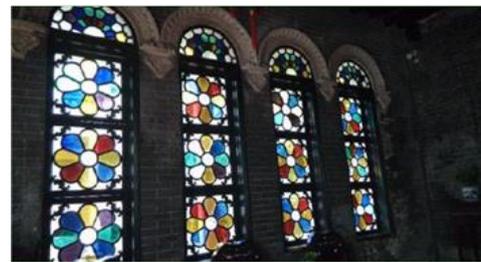


Fig. 12. Manchuria window of Guangzhou Yuyin Garden (photo by the author).

These colorful glass were imported from France, Belgium and other places in Europe, and the price was quite expensive. After the introduction of colorful glass into China, through the improvement of artists in Guangzhou, it has become a unique art form with both Chinese and western flavors, and the design that the first carve makes was western fancy design such as Daisy, lily and so on. Later, by using different concentrations of acid solution with different corrosion time for multiple corrosion treatment, it can be made by meticulous brushwork, freehand brushwork and other techniques of Chinese painting.

Since these glasses were colored with various oxide colorants or metallic colloid colorants such as gold and silver, they were mostly hand-blown, but it had a longer shelf life, and even after half a century, the color remained the same. It was originally bought by Manchurian, and the rich people thought it was beautiful to have Manchuria Windows. It is reported that the families with Manchuria windows at that time were either rich or expensive, Manchuria window was not placed casually in the building, because of its expensive, and it was generally placed in the reception room, important hall and other places.

B. The Development and Inheritance of Manchuria Window in Macau

There are few extant examples of Manchuria windows in Macau; only the Casa Lou Kau Mansion is well preserved (see "Fig. 13"). The colorful glass is embedded in wooden window frames, often in a diamond pattern, with the implication of smooth and steady, and the continuous diamond pattern means continuous. It can be seen that the owners of the garden also gave their future generations a better vision (see "Fig. 14" to "Fig. 18").



Fig. 13. Manchuria window of Casa Lou Kau Mansion (photo by the author).



Fig. 14. Manchuria window of Casa Lou Kau Mansion (photo by the author).



Fig. 15. Manchuria window of Casa Lou Kau Mansion (photo by the author).



Fig. 16. Manchuria window of Casa Lou Kau Mansion (photo by the author).



Fig. 17. Manchuria window of Casa Lou Kau Mansion (photo by the author).



Fig. 18. Manchuria window of Casa Lou Kau Mansion (photo by the author).

IV. CONCLUSION

Mandarin's House, Casa Lou Kau Mansion and folk houses of Rua da Felicidade are among the few Chinese-style houses with the value of "urban heritage" in Macau. They provide examples of "precious" in the study of Lingnan gardens or Lingnan architecture styles, especially the spatial layout of the garden and the architectural art style, which are highly similar to the Lingnan buildings in Guangdong. At the same time, they are full of Western characteristics influenced by colonial culture in Macau. They can be used as an example of the architectural art of the Lingnan-style Macau genre. The historical changes it carries can also be used as an example to study the urban culture of Macau.

For some parts or space in the damaged traditional houses in Macau, scholars can carry out the digital inheritance of historical materials and the restoration of cultural relics through literature and techniques of artisans. In addition to this, related museums can try their best to collect and sort out relevant materials to avoid such cultural fault. Under certain conditions, with the help of VR, Sketch up and Lumion, they can also build a simulated 3d model, so as to show the spatial layout and architectural composition of the garden more intuitively.

For a scholar who is still studying in school, the original construction background and the evolution of styles under the influence of Portuguese colonization could be explored in the few existing Lingnan Chinese style house. The historical influence on Lingnan architecture system can be elaborated, which will provide a reference for future scholars.

For students in higher education institutions, they should cherish the historical and cultural heritage of Chinese landscape. Besides, students need to propagandize the modern Lingnan architectural layout, style of art and culture, for example, through the field investigation of the historical garden and the practical teaching in colleges and universities, they can carry out relevant practical teaching activities, photography competitions, special exhibitions, lectures and workshops derived from the garden (Such as the production experience of paper-cut , bonsai, miniature gray model decoration), through which let more people know the historical changes and unique artistic features through the practice. On the other hand, people can carry out the in-depth study or participate in the practice activity of the management institutions of existing modern and contemporary private garden in Macau through multimedia

teaching mode and the teaching of urban planning, architecture, landscape architecture, history and literature.

Last but not least, the government can increase protection for the remaining Lingnan house garden, strengthen the management, and increase the capital input of the renovation and environment control; for example, the government can try to use the form of training to gather some Lingnan Oyster Shell Window, Manchuria window craftsmen for long-term architectural preservation and learning exchanges. It can also host some activities to arouse the public awareness of the protection of the historical Lingnan architectural culture and promote their participation of the protection activity. At the same time, visitors can start from the trivial things around them while visiting historical sites and experiencing their cultural connotations, taking good care of cultural relics and doing their best to protect and inherit Lingnan private garden culture instead of damaging the hard-won sculptures and ornaments.

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