

Environment·Feature·Culture—Inheritance and Innovation of Traditional Regional Architecture in Jiangnan—Take Suzhou Museum as an Example

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Abstract: The regional architecture of Jiangnan is a bright material and cultural treasure in China. The well-preserved traditional private gardens of Jiangnan and the low-slope buildings with whitewashed walls and tiles set the tone of the overall environment, which together constitute the traditional style of the whole old town of Suzhou. In the presence of the gradual expansion of the scale of modernized buildings, the disappearance of the regional characteristics of new buildings and the phenomenon of the convergence of styles, the Suzhou Museum designed by I.M. Pei has been able to perfectly integrate into the traditional architectural complex of the old city of Suzhou and maintain its own unique charm. Taking Suzhou Museum as an example, this paper starts from three perspectives of environment, feature and culture to study how architects inherit and innovate the traditional regional architecture of Jiangnan in the context of the new era, so as to achieve the effect of blending the old with the new and complementing each other.

Keywords: Jiangnan regional architecture, Suzhou Museum, Architectural design, Traditional culture, Modern architecture

1. Introduction

With the advancement of China's modernization in the new era, the comprehensive national power is increasing year by year, while the construction field is also undergoing radical changes. Entering the 21st century, the development of new structures and building mechanics has brought vigorous vitality to the progress of Chinese architecture. The architectural style of western countries has entered the period of post-modernist style, and the wind of internationalization, modernization, and energy-saving architectural trend has also blown into the country at the same time.

China is a vast country with different cultures, and the constructions in different regions have their own characteristics. However, the fusion of East and West, the old and the new, in the face of the gradual expansion of the scale of the modern building, the new architectures of the regional characteristics of the disappearing, the phenomenon of the convergence of styles from time to time, China's long history of the accumulation of excellent traditional culture disappeared in the field of architecture. Into the new era, how to keep up with the pace of the times while inheriting the characteristics of local traditional architecture and the continuation of the cultural lineage, which has become a problem for contemporary architects to ponder.

Jiangnan region has been a place celebrated since ancient times in China, and the traditional architecture of Jiangnan is also the charm of Jiangnan's beauty[1]. This paper takes the Suzhou Museum designed by Mr. I.M. Pei as an example, through field research, data review, analysis and summary and other methods, it cuts in from the perspective of environment, culture and feature to explore how architects can carry on the inheritance and innovation of traditional regional architecture of Jiangnan in the context of the new era.

2. Characteristics of Regional Architecture in Jiangnan

Jiangnan region generally refers to the middle and lower reaches of the Yangtze River in China, basing on the delineation of the Study of Jiangnan Municipalities in the Ming and Qing Dynasties, this paper takes Jiangnan as geographically encompassing the southern part of Jiangsu, the northern part of

Zhejiang, the southern part of Anhui, as well as the Shanghai area[2]. The Jiangnan region has unique topography and terroir, and traditional architecture is also unique and highly recognizable in all aspects. The following section will introduce the characteristics of Jiangnan regional architecture from three aspects: geographical setting, humanistic features, and architectural style.

2.1. Geographical Setting

The Jiangnan region has a high west and low east topography due to its location in the middle and lower plains of the Yangtze River. The terrain is flat, with many plains and hills and a dense water network. Located in the geographical area affected by subtropical monsoon climate, abundant sunshine throughout the year, mild and humid climate, warm winter and hot summer, more rainfall, and longer rainy season (June and July every year). The soil of Jiangnan region belongs to clay[3]. Jiangnan regional architecture is mostly built on the basis of such a geographical environment.

2.2. Humanistic Features

Jiangnan culture is an important intangible cultural heritage of China, rich in aesthetic charm and humanistic spirit. From Taibo's running to Wu to Yongjia's southward migration, from the canal transportation to Zhao Song's southward crossing, the war-torn Chinese civilization has been deeply integrated and recuperated in Jiangnan for many times, and the fertile soil of the water towns has given birth to the Jiangnan culture that is tolerant and absorptive, innovative and open. Wunong, the local dialect of Suzhou, is a quiet and soft language; and the water culture of the water town has also shaped the gentle and low-key character traits of the people in Jiangnan. Nowadays, Jiangnan still retains the delicate, gentle, strict and hardworking humanistic characteristics accumulated over thousands of years of history.

2.3. Architectural Style

(1) As shown in figure 1, white walls and black tiles are one of the most intuitive impressions left by the architecture of the Jiangnan region. In ancient times, although Jiangnan region was not the capital city, but has been an important administrative region. In the feudal period under the strict centralized control, the ruler of the building color control was quite stringent. Therefore, different from the temples and palaces, general residential buildings are plain and low-key white walls and black tiles form. Painted snow-white walls and roofs covered with green-gray tiles make up the classic picture of traditional Jiangnan houses in people's impressions.



Figure 1: White walls and black tiles

(2) Buildings are more low-rise. The traditional regional buildings in Jiangnan are mostly low-rise buildings with less than three floors, mainly two-story buildings. The architectural form of two-story buildings is also due to the limited land use caused by the dense water flow in the southern region, and the purpose of widening the living area in the river area.

(3) Figure 2 illustrates the towering area at the top of the two gable walls of the building forms a unique "horse-head wall". Because of the ancient building is mainly wooden structure, and point candle lighting, and the towering wall structure can effectively in the event of fire to isolate the fire source, to prevent disasters, so the formation of this architectural details. Because of its resemblance to a horse's head is called the horse-head wall, the style of the horse-head wall has also become a symbol of the regional architecture of Jiangnan features remain in use to this day.



Figure 2: Horse-head wall

(4) Jiangnan regional architecture is often equipped with exquisite gardens. Jiangnan classical gardens attach importance to the water, pick up the mountain, stacked stones and other gardening skills, skillfully borrowed landscape techniques, garden landscaping into the garden buildings, to create elegant and interesting architectural style.

(5) Small eaves, sloped roofs are also typical of the traditional regional architectural features of Jiangnan. Due to the influence of subtropical monsoon climate, Jiangnan region is rich in precipitation, the summer temperature is higher, the slope of the roof is easier to drain, but also can play a certain effect of heat insulation.

3. Introduction to Suzhou Museum

Suzhou Museum is located in the old town of Suzhou, Jiangsu Province, within the scope of the historical preservation district, the east side is next to the key cultural relics protection unit of Suzhou, Chungwang Mansion, and the north side of the famous world cultural heritage, typical of the Suzhou-style garden Humble Administrator's Garden. In October 2006, the Suzhou Museum was completed. As one of the most iconic public buildings in Suzhou, the main building of Suzhou Museum has always attracted the attention of countless architecture enthusiasts from home and abroad.

The designer of the Suzhou Museum, I.M. Pei, is a Chinese-American contemporary architect of Suzhou origin. I.M. Pei's early architectural design style was influenced by Mies van der Rohe's minimalist idea of "less is more" and Corbusier's "sculptural approach", and his initial designs reflected representative modern architectural features, focusing on designing simple, practical, and low-cost modern buildings; in his early years, I.M. Pei's architectural style was influenced by Mies van der Rohe's "less is more" and Corbusier's "sculptural approach". In the middle of his design career, Mr. I.M. Pei gave deeper thought to the relationship between function and form, focusing on the geometric modeling of buildings; in the late stage, Mr. I.M. Pei began to incorporate the elements of regional culture into his architectural designs[1][4]. Mr. I.M. Pei lived in the Lion's Garden in Suzhou during his childhood, and it is the impression of his childhood life combined with his lifelong design concepts that gave the Suzhou Museum its distinctive architectural characteristics[5].

Based on the style characteristics of traditional regional architecture in Jiangnan, Suzhou Museum integrates Mr. I.M. Pei's personal design style as well as modern architectural technology, which makes the architectural appearance of Suzhou Museum the same as the traditional regional architecture in Suzhou, but without losing its personality and vitality as a modern architecture, forming an organic whole that integrates the modern and classical flavors.

4. Inheritance and New Expression of Architectural Environment, Feature and Culture of Suzhou Museum

The well-preserved traditional private gardens of Jiangnan and the low-sloping buildings with whitewashed walls and tiles together constitute the architectural landscape of the old city of Suzhou, which inherits the cultural heritage passed down for thousands of years, and the Suzhou Museum has become an indispensable part of it. The following section analyzes how the I.M. Pei designed Suzhou Museum integrates into the old city and still highlights its own characteristics in terms of environment, landscape and culture.

4.1. Environment

4.1.1. The urban texture

As an element in the urban environment, architecture should be integrated into the environment and suitable for the city. There is a height limit of 24 meters for buildings in the old city of Suzhou, therefore, in terms of elevation, the design of the Suzhou Museum adheres to the principle of "not too high, not too big, not too prominent" [6], and the main building adopts the architectural form of one floor under the ground and one floor above the ground, so as to make the low museum body blend into the environment of the old city as it depicted in Figure 3.



Figure 3: Suzhou Museum in the Old Town of Suzhou

In the layout of the plane, the Suzhou Museum and the surrounding Humble Administrator's Garden and Zhongwang Mansion complement each other. It adopts the same dimension and direction of the north-south longitudinal layout, forming three axes, namely Zhongwang Mansion, the entrance and hall of the museum, and the western exhibition area of the museum. This layout conforms to the urban texture of the old city and also has the effect of integrating into the surrounding environment.

From a bird's eye view of the Suzhou Museum and the surrounding urban environment, the unity of the black and white gray tones and the consistency of the geometric lines make it possible for people viewing the museum to realize that it is a modern piece of work that is different from the surrounding ancient buildings, but does not feel out of place in the least.

4.1.2. Landscape

In terms of landscaping, the Suzhou Museum's small square is home to a beautifully chic, modern Jiangnan garden. The museum expresses the traditional gardens in a pictorial style, without directly copying the traditional Suzhou garden design style and techniques. As shown in figure 4, the small square adopts the landscape elements of classical gardens such as rockery, ponds, small bamboo forests, etc. The volume of all garden features is not large, and the barge border on the water surface is also a regular curve type, which makes the overall garden landscaping more artificial than wild, but not mechanically dull, but rather appearing to be refined and beautiful.



Figure 4: Landscape in Suzhou Museum

The use of lake stone is the soul of the Jiangnan classical garden. In the design of garden stone, I.M. Pei made the pure natural lake stone to the extreme. In the garden water feature design of the central courtyard of Suzhou Museum, a wall between the museum and the northern part of the Humble Administrator's Garden is skillfully utilized, and the stones are stacked in an orderly manner at the waterfront and close to the root of the wall, with the white wall as the paper, and the stones as the ink, to create the effect of a landscape painting. From a distance, the landscape is a hidden scene, and up close, it is a garden water feature with lake stones[7].

The central courtyard makes people's eyes light up as soon as they enter the hall. The water in the pool is drawn from the Humble Administrator's Garden, and the measure of drawing water from the surrounding environment strengthens the connection and integration between the site and the surrounding area, and such a connection has the effect of complementing each other.

4.2. Feature

Although I.M. Pei's Suzhou Museum adopts the traditional features of the Jiangnan region, such as white walls and tiles, and uses black, white and gray as the color tone, it shows a completely new way of expression. The eaves and roofs of traditional buildings in Jiangnan are usually made of small green tiles stacked on top of each other, while the eaves and roofs of the staggered Suzhou Museum are made of uniformly colored dark grey stone pretending to be "Daiwa". Eaves dark gray stone material is a kind of granite called "China black", it and the traditional small tiles have very similar properties: dry dark gray, and wet by the rain when showing black. Compared with the highly permeable and fragile small green tiles, granite is hard and unbreakable, more durable, and more able to prolong the life of the building and improve the ornamental value. This choice of material not only respects the local characteristics, but also meets the needs of modern use.

The roof and roof form of the museum follows a lot of traditional sloping roof elements, forming a triangular geometric shape. This is not only an impression of the lines of the traditional Jiangnan sloped-roof building, but also an integration of I.M. Pei's personal style. The courtyard wall of Suzhou Museum adopts the form of "horse head wall" of Jiangnan regional architecture and gives it a new expression. The courtyard wall of Suzhou Museum intentionally highlights the position of the "horse-head wall" at the head of the traditional wall, retaining the characteristics of the traditional horse-head wall stacked one on top of the other, while abstracting its image into a geometric linear structure, which is visually more concise and condensed.

The interior of the Suzhou Museum uses a large number of glass and steel structures to maximize the introduction of natural light as shown in figure 5, using modern structures to make up for the lack of indoor lighting in traditional buildings[8]. With this design, the light inside the house can give the building a certain sense of transparency under the regulation of the top shading strip, making the internal and external space fully communicative and energetic.



Figure 5: Interior structure with light introduced

4.3. Culture

The embodiment of cultural flavor begins with the choice of site, the Suzhou Museum is located in the old city of Suzhou, surrounded by the Humble Administrator's Garden, Liuyuan Garden and other attractions of the famous garden, where the placement of the museum building with the manifestation

of the cultural heritage, appropriate, the continuation of the old city of the coherent cultural lines, and become a window to further shape the characteristics of the city.

The idea of "unity of heaven and mankind" is an important reflection of traditional culture in architecture. Throughout history, traditional Chinese architecture has always emphasized integration with the environment. I.M. Pei's Suzhou Museum can also be integrated into the local cultural environment, without losing the traditional architectural spirit of "unity of heaven and man", and everywhere in the traditional architecture of culture; at the same time, as a museum building, it should also give full play to the display of the cultural characteristics of the region, the role of the transmission of the cultural spirit of the exhibition of the exhibits do not embody The exhibits of the exhibition all reflect the vitality of traditional culture[9].

"Poetry and picturesque" is also a traditional regional architecture of Jiangnan cultural characteristics that Suzhou Museum wants to show. The poetic and picturesque meaning of architecture and landscape design is to give the architectural space scenes the same meaning as in ancient Chinese poems and paintings. Although today's thinking is mixed, landscape design presents a trend of liberalization and diversification, but the creation and application of poetic garden mood in modern gardens are still sought after[10]. Writing garden, the building of pink wall and tile elements into the urban environment, these design techniques are all in the traditional regional architecture of Jiangnan "poetry and picturesque" mood to bring every visitor.

4.4. Enlightenment to the inheritance and innovation practice of contemporary traditional architecture

4.4.1. Environment

For new buildings, the architectural environment shall be considered, and the regional environmental characteristics, urban texture characteristics and natural background conditions of the site shall be fully investigated. Based on the principle of adjusting measures to local conditions, architectural design should be carried out without destroying the urban texture. Some elements outside the site can be introduced to make the building adapt to the terrain and integrate into the environment. In terms of architectural form and contour expression, certain innovation can be adopted to try to add vitality to the environment.

4.4.2. Feature

In addition to considering the use of the style elements of pink walls and black tiles, we can also start from the current situation of the site, or combine the elements of the surrounding environment to guide and conduct the corresponding design adaptively, giving these architectural elements some traditional flavor. In addition to the element symbols, they can also be imitated.

4.4.3. Culture

The culture expressed by the architecture should conform to the tradition, which can bring forth the new, but cannot be completely deviated from. During the preliminary analysis, in addition to understanding the "hard" conditions such as the landform and location relationship of the construction site, we should also pay attention to the "soft" connotation such as the traditional cultural spirit, and dig deep into the cultural heritage of the site [11].

5. Summary and outlook

At a time when traditional architectural features are being lost in big cities, Suzhou Museum has inspired contemporary architects to think about the inheritance and innovation of architectural design. This paper takes the Suzhou Museum designed by I.M. Pei as an example, and based on the background research and the clarification of the characteristics of the traditional regional architectural styles in Jiangnan, it analyzes the inheritance and innovation method of Suzhou Museum on traditional culture from three aspects of environment, feature and culture, and considers that the inheritance and innovation of traditional regional architecture in Jiangnan should firstly conform to the natural geographic environment and be integrated into the urban texture, and then use architectural elements that can reflect the characteristics of local architectural styles, and finally not neglect the traditional humanistic spirit in the building. Secondly, the architectural elements that can reflect the characteristics of local architectural style should be selected, and finally, the expression of traditional humanistic spirit in architecture should not be neglected. Entering the new era, it is the unshirkable responsibility of

every architect to protect the city's characteristics and prevent the traditional culture from fading away.

In future architectural design, we should continue to promote architectural innovation on the basis of integrating into the surrounding environment, preserving traditional features and continuing cultural characteristics. In more research to understand the environment and historical heritage at the same time should also be combined with the new era and new technology. Let the modern architecture can not only capture the soul of the classical, but also give people a refreshing sense of the times, why not incorporate some of the highlights of personal style and modern elements at the same time?

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