Three Views on I.M. Pei’s Aesthetic Concept of Design

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Abstract

As a world-renowned modernist architectural design master, I.M. Pei designed many classic works. The concept of natural and simple design is the core of Pei's architectural thought. Firmly upholding modernist architecture's core concepts and artistic values, Pei has carried out continuous exploration, expansion, and interpretation. Based on inheriting the first generation of modernist architects, he has integrated humanistic and natural factors into modernist architecture and expanded the cultural adaptability of modernist architecture. It has formed its exquisite style. This paper interprets I.M. Pei's design aesthetic concept through three aspects: functionalism of "less is more", humanism of "locality", and naturalism of "taking advantage of the situation". By studying the aesthetic characteristics of I.M. Pei's architectural designs and the design techniques used in them, we can gain a more thorough understanding of the charm of Pei's language and further develop modernist architectural aesthetics based on his predecessors.

Keywords

I.M. Pei, design aesthetics, modernist architecture

1. The functionalist design concept of “less is more”

1.1 Rationalist architectural forms

I.M. Pei's rationalist architectural form is inspired by modernist architectural design, which advocates getting rid of traditional architectural forms' constraints, abandoning traditional architecture's false decorations, and expressing powerful concepts with simplified forms, reflecting a kind of "form rationality" that advocates simplicity. Modernist architectural design advocates the architectural concept of "less is more", in which "less" refers to the rationality and rigor of architecture and the simplicity and purity of form; "more" refers to the functionality of the "less" refers to the rational and rigorous architecture and the simplicity and purity of the form; the "more" refers to the functional completeness and the richness of the architectural aesthetics. I.M. Pei advocates simplifying the cumbersome and redundant architectural decorations in traditional design and creating visual effects with abstract geometric forms and mathematical order to give people a visual impact. Inspired by Le Corbusier, I.M. Pei kept simplifying architectural forms, omitting transitional and ill-defined geometric forms as much as possible, and determined a set of formal typologies based on basic geometric forms such as squares, rectangles, and circles. I.M. Pei's design for the Kenney Building is based on a typology of forms based on basic geometries such as the square, the rectangle, and the circle, with which he expresses multiple connections between form and content. The Kennedy Library, designed by I.M. Pei, has a highly rational architectural form. This building was built in honor of JFK, the national president of the United States. The building is built by the sea, and the geometric elements such as three-dimensional triangles, squares, and circles can be identified from the shape of the building, which is dominated by a large square black glass curtain wall, combined with a three-dimensional triangle, forming a staggered pattern, set on top of the all-white front...
building, with trigonometric columns and cubic glass boxes forming a simple, black-and-white contrast with the low circular columns. The black curtain wall reflects the potential column entity and enhances the feeling of reality and fiction. The geometric elements of the main body of the building are used in a variety of ways to give the building an overall interesting effect with an almost rationalistic geometric expression.

1.2 Industrial-style technical materials

I.M. Pei favors modern materials such as concrete and glass, and is familiar with the inherent properties and special advantages of building materials, focusing on the philosophy inspired by the nature of materials, the true expression of materials and structures as they are, and the direct use of materials without embellishment. "Construction is an activity that integrates various construction materials and components" (William J. R. Curtis, 2011). The abstract order and charm of I.M. Pei's architectural works often rely on the simplicity of the construction concept and the realistic reproduction of industrial materials. The "roughness" advocated by Corbusier pushed the textural expression of concrete materials to the top of the design wave (Wang Chuang Yi, 2018). Inspired by Corbusier, I.M. Pei liked to use fair-faced concrete as the material of architecture in the early days. Concrete has the natural dense and solemn sense of stone and has strong plasticity. In the design of Kip's Bay Plaza Apartments, concrete was poured into the model and molded directly as a staircase. The building is gray, and with the simple geometric shape, it shows a modest temperament. Glass, as a directional marker for the development of the architectural era, also plays an important role in I.M. Pei's creations. Glass has perfect visibility, allowing vision to penetrate to any desired depth, and its lightness and thinness move the maintenance structure from weight to weightlessness. The glass is transformed by the light at its disposal, and the building exhibits different light and colors in the changing day and night of sunlight and light. The building reflects the surrounding images like a giant mirror, adding a touch of whimsy and fantasy to the hustle and bustle of the cityscape. The transparency of glass is incorporated into the building in a highly modern and unique way. I.M. Pei knows how to play with the artistic expressiveness of glass itself. The Louvre glass pyramid is like a shining diamond, crystal clear and radiant, minimizing the blockage of light, mapping the changing skies of Paris and the brown masonry of the palace; it highlights its centrality without obscuring the gravity and majesty of the ancient building of the Louvre, and opens up both the underground world and the building itself.

2. The humanistic design concept of "locality"

2.1 The poetic metaphor triggered by humanistic history

I.M. Pei developed many of his own understandings and reflections on architectural design based on his inheritance of Gropius' design philosophy. During his studies, he believed that architectural design should integrate the local humanistic and natural environment and other factors and should reflect regional cultural characteristics while constructing modernist architecture (Weng Zehua & Miao Jing, 2021). This design philosophy is also fully reflected in his architectural works, and I.M. Pei's attachment to oriental contexts is more clearly expressed in the design of the Meixiu Museum of Art in his later years. The concept of I.M. Pei's Meixiu Art Museum is based on Tao Yuanming's "The Peach Blossom Garden", by a poet of the Eastern Jin Dynasty. As the visitor crosses the square and wanders through the path of the hanging cherry trees, he can soon see a tall tunnel entrance between the hills, about one kilometer long, with reflective light decorations on both sides, which looks like a strip of light from afar. Here, I.M. Pei has piqued the visitor's interest to a level of "suspense" and aroused the curiosity of the viewer. This is a metaphor for the poetic scene in "The Garden of Peach Blossoms": "At the end of the forest, there was a mountain with a small opening, as if there was light, so the boat entered through the opening". I.M. Pei's treatment here uses the design techniques of "wanting to reveal before hiding" and "wanting to raise before suppressing". The sound of flowing water echoes in the ears, and then picking up the steps to step into the fascinating art hall, is such a wonderful journey, which coincides with the ancient literati's journey to the paradise of the heart! "Although he does not blindly imitate old styles, he finds a 'quintessence' in historical works - history is distilled into a universal product" (Zhang Yan, 2020). I.M. Pei balances tradition and modernity in the design of Meixiu Museum of Art in the best way and interprets humanistic history with modern architectural language.

2.2 The viewer's emotion triggered by ethnic architecture

Architecture is not only the place where human beings live and work but also the expression of culture. The
regional ethnic characteristics brought by architecture convey to the world not only the visual aesthetic feeling but also the more profound emotional heritage. In the design process, I.M. Pei respects regional culture, adapts to local conditions, and often cites prototypes of ethnic architecture, as can be seen in the design of the Suzhou Museum, where I.M. Pei's direction of thinking about ethnic architecture can be seen. Located in the historical core of the ancient city, Suzhou Museum successfully plays the role of inheriting history and opening up the future. The design guideline "not too high, not too big, not too prominent" summarizes the architectural texture of Suzhou's historic district. The control of the height of the main building shows that the Suzhou Museum never exceeds the surrounding ancient buildings, integrating the local architectural culture with this approach in line with the traditional residential buildings. The layout of the museum environment takes the Lion Grove as a source of inspiration. It draws on the design of courtyards in Suzhou's private gardens, which is applied to the spatial layout of the museum so that the old and new buildings are unified and connected. In the spatial structure of the Suzhou Museum, the design of the "one entry" is combined with a central axis that runs through the east and west, with a service-oriented reception atrium in the middle, consisting of an entrance gate and a patio garden. The west side is a two-story exhibition building. Unlike the contemporary circulation-oriented museum space, the west side uses a room connected to a room separated from each other, which also meets the special scenario of smaller-scale collections in Suzhou Museum. On the east side, modern art galleries and three courtyards with different styles are connected by an alleyway to the Zhongwang Mansion. The Wisteria Garden in the middle of the east side contains two hand-planted wisteria vines grafted from Wen Zhengming, and thus has a sense of storytelling and history. As the most crucial courtyard space on the central axis, the Suzhou Museum designed by I.M. Pei perfectly interprets the beauty of the classical gardens of Suzhou, which always conveys the humanistic sentiment of the gardens of Suzhou to the viewers, fully satisfies the psychological needs of the public, satisfies the aesthetics of the public, and gives the viewers a spiritual belonging.

3. Naturalistic design concept of "taking advantage of the situation"

3.1 "Natural climate that "varies from time to time"

As for the natural climate, which varies from time to time, different geographical locations form different climates, and different climates create different natural environments, reflecting different architectural characteristics. The natural climate often influences the choice of materials, colors, and forms of architecture. I.M. Pei understands the influence of natural climate on architecture. Due to the humid climate in the south, the architectural characteristics of the dwellings in the south of the Yangtze River are pink walls and tiles. Considering the influence of climate, I.M. Pei continued to use the architectural color palette of Jiangnan dwellings with pink walls and tiles in the design of Suzhou Museum to harmonize with the surrounding environment. However, at the time of construction, the building materials were not made of traditional wood, but by the use of modern materials such as granite, steel, and glass, the characteristics of the natural climatic conditions of the area were fully utilized and exploited. In the design of the roof, I.M. Pei chose granite stone pieces to replace the small green tiles of the Jiangnan dwellings and processed them into geometric shapes before laying them on top of the roof, presenting a strong sense of three-dimensionality. These granite stones have rich color variations, black when it rains and dark gray when the sun shines. Moreover, when I.M. Pei designed the building, he considered the abundant precipitation in the Suzhou area. He created the sloping roof as a geometric shape, which is conducive to the rapid elimination of rainwater during rain and also breaks through the shortage of traditional large roofs in terms of light. Nature can guide people's architectural design and provide energy power for people's lives. In the Suzhou New Hall, we can also see that I.M. Pei has introduced natural light to the maximum extent in the building to reduce the use of indoor lights, and I.M. Pei has adopted the design of glass skylight to solve the problem of light to the greatest extent. The extensive use of metal shades under the glass skylight solves the problem of lighting the large roof and controls the light source to meet the demand for light in different spaces. Natural light pours through the transparent glass into the interior, replacing most artificial lighting and saving energy. In contrast, light as a medium of transmission is expressed in all details of the building, and the scenery inside the museum changes with the natural seasons and sun rays, presenting different light and shadow effects and shaping a more oriental mood of the architectural space.

3.2 Topography that "varies from place to place"

I.M. Pei's first concern was to adapt the building to the topographic conditions, i.e., to determine the possible
influence of the topography on the structure from the characteristics of the terrain in which it is located, and then to revise the design scheme in order to promote the adaptation of the building to the terrain. The National Center for Atmospheric Research, designed by I.M. Pei, is located in the valley of the Rocky Mountains and is a place for scientific experiments, collective discussions and research topics. The cave sites where the Indians lived inspired Pei's design, and he found that the Indian buildings of mountain rock harmonized extremely well with the majestic mountains as if they had grown out of the ground. Inspired by the Indian cave architecture, the building uses predominantly solid walls with almost no sense of scale, which can be appropriately integrated into the Rocky Mountain environment. At the same time, a combination of cubes and cylinders is used to form a simple and sharp building shape, as if cut from a huge stone, giving a sculptural combination of forms. In terms of building materials, I.M. Pei decided to use sand and gravel from the local quarry, mixing them with concrete and finishing them with chiseled stone, revealing a deep pink surface with a light mica-like luster, giving the building a life-giving glow. Due to the extreme natural climate created by the high topography of the research center, I.M. Pei designed the walls of the building to be nearly three meters high in order to withstand the strong mountain winds, the warm light and the drastic temperature changes, while keeping the windows small, taking up only one-tenth of the entire wall structure, and using gray heat-absorbing glass, which is concealed in dark gray window openings, so that the whole The simple geometry of the building form conveys a solemn and profound architectural image. In contrast, the geometric shape of the building is integrated with the mountain, which is solid yet intimate. Through the use and reference of the topography, I.M. Pei makes use of the local conditions and harmonizes the geometry, color, and texture of the building with the rocky background of the mountain, originating from nature and rising above it, designing a building that complements the natural environment and becoming a model in architectural design.

4. Summary

To sum up, as a designer with worldwide influence, I.M. Pei is deeply impregnated by traditional Chinese culture and directly inherited from the core vein of modernism and has united the spirit of both Eastern and Western cultures, examining the panorama of modernist architecture in a broader historical and cultural perspective, treating it as "an unfinished ideal" and "With more than half a century of unremitting creation, he explores how the modernist form has been accepted, rejected, and how it can be revised and developed (Li Chun, 2019) . However, I.M. Pei always adhered to the basic principles of modernist architecture, explored the "local" architectural expressions such as humanities, history and national architecture, and integrated them into modernist architectural design, presenting the harmony between architecture and nature, modernization and history and humanity. However, I.M. Pei has always adhered to the basic principles of modernist architecture, explored the "local" architectural expressions such as humanities, history, and national architecture, and integrated them into modernist architectural design, presenting the terms of architecture and nature, modernization and history and societies, and evoking the return and development of the inner law and order of architecture at a deeper level.

References