

Research on the Application of Regional Factors in Museum Design

Feng Ding

Shanghai Institute of Visual Arts ,Shanghai China ,201620,China

Abstract. Museum is a place to show wisdom and knowledge to the public. It is one of the cultural symbols and symbolic buildings of a country or place. Therefore, the characteristics of regional factors should be fully considered in the construction of museums. This paper discusses the application of natural environmental factors in museum design from the aspects of climate and geomorphic environment. The application of regional cultural elements in museum design is discussed from the aspects of traditional culture and landmark culture. This paper analyzes the regional characteristics of bionics and high technology in museum design, hoping to provide theoretical basis and reference for the research of regional factors in museum design.

Keywords: regional factors, museums, design, application

1. Introduction

The museum is a place to show wisdom and knowledge to the public. According to the contents of the collection, our museums can be divided into five categories: comprehensive museums, historical museums, art museums, science and art museums and other museums. Since the founding of New China, the number of museums in our country has undergone great changes. There are only 21 museums in 1949, 214 in 1965 and 349 in 1978. With the reform and development, the number has increased to 2,323 by 2005 and increased by 30% in 2010 compared with 2005. Social forces have also started to set up museums (Table 1). Predecessors are mainly concentrated on the study of the museum in museum architecture design and its theory research, discussing the future development trend of museums, the research on museum architectural form and space design, the research on the relationship between museum architecture and city, and the discussion on the strategies, ideas and methods of museum architectural design. Systematic research on museum architectural creation from a regional perspective is rare, and the existing research is only limited to some regions [3]. Therefore, on the basis of previous studies, this paper summarizes the application research of regional factors in museum design, hoping to provide theoretical basis and reference for the research of regional factors in museum design.

Table 1. Number of Museums in China in Different Periods

Year	1949	1965	1978	2005	2010	2014
Number of museums	21	214	349	2323	3020	4548

2. Application of Regional Natural Environmental Factors in Museum Design

The application of natural environmental factors in museum design mainly includes adaptation to regional climate and landform.

2.1 Application of Climate Conditions in Museum Design

The overall architectural image of the museum is closely related to the environment, so it should coordinate with the environment, respect the environment, and use modern design methods to show the regional characteristics. According to the climate characteristics of the area where the museum is located,

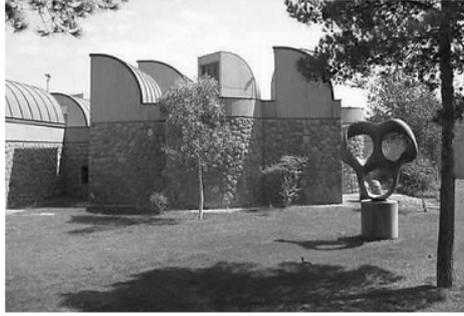


Figure 1. Iranian Museum of Contemporary Art



Figure 2. Norwegian Knut hamson Museum



Figure 3. Guangdong Museum

Some of the cultural relics in the museum need to be moistureproof, some need to be dry-proof, and some need to be ventilated. For example, the Iranian Museum of Contemporary Art shown in fig. 1, due to its dry and rainy climate characteristics, the possibility of cracks caused by long-term exposure has been fully considered in the architectural design, so the wind catching sunshade window has been added. The Russian Museum is located in a high dimension and is cold and dry. In order to achieve better thermal insulation effect, the opening of the outer wall is relatively small and the wall is relatively thick. The climate in the area where the Norwegian Knut hamson Museum is located shown in Figure 2 is cold and rainy. In order to gain more sunshine, the windows are relatively large. Kazakhstan's Central National Museum is located in a dry and rainy climate area with large sandstorms and strong solar radiation. In order to prevent these unfavorable factors, the museum's building has been designed with an inward sealed thermal insulation form. The Guangdong Museum shown in fig. 3 is located in a tropical monsoon climate with humid heat and heavy rain and high air humidity, so natural ventilation is fully used in the design of the building.(Table 2)

Table 2. Application of Different Climate Conditions in Museums

Museum	Climate characteristics	Consideration factor	Application
Iran Museum of Contemporary Art	Drought and little rain	Cracking Caused by Long-term Exposure	Wind catching sunshade window
Russian Museum	Cold and Rainless	Avoid cold snap or scorching sun	The hole in the outer wall should be as small as possible.
Norwegian Knut hamson Museum	Cold and rainy	Strive for more sunshine	The windows of the building should be as large as possible.
Kazakhstan Central National Museum	Dry heat and little rain	Solar radiation, dry air	Interior Closed Building Insulation Form
Guangdong Museum	Hot and humid and rainy	Air humidity is high	Realize natural ventilation

2.2 Application of Geomorphological Conditions in Museum Design

Any building is built according to its terrain, and the construction of museums is no exception. For example, Hunan's "Four Goats and Fang Zun" Bronze Museum, which is reputed as a national treasure, is located in hilly and mountainous areas. The construction of the museum is obviously stepped. The Great Egyptian Museum of Giza and the surrounding Giza Jinyuta Group echo and match each other, achieving amazing results.

3. Application of Regional Cultural Factors in Museum Design

It is the main subject of the development of The Times to carry forward the excellent traditional culture of the nation, while museums are the carriers of classical space for inheriting, researching and spreading excellent traditional culture. As cultural buildings, museums reflect people's aesthetic taste and social psychological needs, and are also regarded by many countries as important means to safeguard national culture.

Integrating traditional culture into the architectural design of the museum to obtain inspiration in form and spirit is not only linked with regional culture, but also has typical spirit and connotation of the times. For example, the Western Han Dynasty Nanyue King Museum uses modern materials to interpret the cultural connotations of more than 2,000 years ago. The Opium War Naval Warfare Museum and the Sino-Japanese War Museum are representatives of the spiritual culture of famous ethnic groups, reminding them not to forget their national shame and history.

Only by understanding the symbols of regional culture can the architectural form with local characteristics be expressed in museum design. The construction of regional symbol culture can be achieved by means of space atmosphere, application of traditional architectural symbols, and even the setting of sketches in the architectural environment. The design methods of traditional architectural symbols mainly include restoration and symbol. The restoration strictly follows the construction methods of ancient buildings and reflects the charm and temperament of traditional buildings. Symbolic style mainly applies representative symbols to modern architecture to avoid the contradiction between tradition and modernity. For example, the ancient town of Fenghuang in Hunan, which is known as the first ancient town, gives the appearance of the bronze museum a kind of bamboo hut, which coincides with the living characteristics of Hunan. There is also the Zigong Lantern Museum in Sichuan, China, which is famous for its colorful lights and has set up a museum marked by colorful lights. The new Suzhou Museum combines tradition with modernity in its architectural style and takes Wu culture as its foundation and expression form, achieving wonderful results.

4. Application of Technical Factors with Regional Characteristics in Museum Design

The construction of museums is different from ordinary large-scale residential buildings. It needs to embody certain cultural and technological characteristics and has unique effects. Therefore, how to use the latest technology and methods and implant regional cultural elements in the construction of museums is a great challenge to museum design.

Bionics has been widely used in museum design in recent years, making the shape of the building show flexible characteristics. The Milwaukee Museum in the United States simulates the unique posture of birds in the region, which is full of dynamic feeling and beautiful image, making the concept of harmonious coexistence between architecture and nature perfectly revealed.

With the development of construction technology, it is not uncommon for high-tech materials to be used in museums. For example, the Yamanashi Fruit Museum in Japan uses high-tech materials and ecological technologies that integrate local characteristics, making the museum highly modern and regional, while conforming to the concept of sustainable development.

5. Conclusion

As for the application research of regional factors in museum design, different scholars have conducted corresponding research based on their academic background. From the perspective of scale, there are macro and micro types. Theoretically, it is mainly guided by relevant theories of semiotics, typology and phenomenology. From the point of view of elements, they all cover the study of place, shape and space. The design of the museum not only enables the public to enjoy beauty, but also inspires national cultural identity and pride. Therefore, special attention should be paid to the study of various regional factors in the design of the museum, so that the appearance and connotation of the museum buildings reflect regional characteristics.

References

- [1]. Zhi Wenjun. Space Shaping in Historical Dialogue-Interpretation of Melbourne Museum [J]. *Journal of Architecture*, 2003,(1):70-71.
- [2]. He Jingtang. My Thoughts and Practice [J]. *Urban Environmental Design*, 2004,(2): 37-38.
- [3]. Zou Denon, Liu Conghong, ZhaoJianbo. Achievements, limitations and prospects of Chinese regional architecture [J]. *Journal of architecture*, 2002,(5):1-4.