

A comparison and combination of modern and historical architecture

Yongting Liu

Dulwich International High School, Suzhou, 215000, China

2429207422@qq.com

Abstract. Considering the rapid development of today's society, earth-shaking changes have taken place in many areas, and the field of architecture is no exception. More and more new buildings are emerging. Some of them are built with different materials, some are in innovative styles, and some are for diverse uses. People can clearly find the differences between modern buildings and ancient buildings, including the differences in materials, uses, structures, etc. By tracing and analyzing the relationship between ancient architecture and modern architecture, this paper discusses the architectural style, materials, and how to combine the two. It can be concluded that there are differences existing in materials, structures, and space utilization between ancient and modern buildings. Ancient buildings pay attention to beauty and the embodiment of national spirit, but they do not perform well in the fire resistance and the construction period is long. Modern buildings focus on practicality and safety but may allow less daylighting to enter or have other unreasonable designs. Therefore, the materials and styles of ancient buildings and modern buildings can be well integrated to maximize the role of architecture.

Keywords: ancient architecture, modern architecture, style, material.

1. Introduction

Architecture has always been an essential part of Chinese culture in history. From caves to a variety of houses, there is a big advancement in the architecture field. People create buildings for different purposes according to different locations, climates, and terrains, and thus the diversity of architecture is gradually produced. Ancient architecture can be divided into many kinds, such as the frame structure and the courtyard group layout. Frame structure is the most important feature of ancient Chinese architecture in architectural structure since ancient Chinese architecture is mainly wood-frame construction, that is, wooden columns and beams are used to form the frame of the house. The weight of the roof and eaves is transferred to the column through the beam frame, and the wall only plays the role of partition, rather than bearing the weight of the structure. This structure can make the house meet the ever-changing functional requirements of life and production under different climatic conditions. Each residence, palace, government office, and temple in the courtyard group layout are composed of a number of single buildings, some enclosures, walls, and so on. Generally, most courtyards are strung back and forth, through the front yard to the back yard. With the development of the changing times, architecture has also undergone great changes, no matter in appearance and structure or in function. Modern architecture did not suddenly appear with the advent of the 20th century. Its emergence can be

traced back to the industrial revolution and the great changes in social production and social life caused by the revolution. First, the emergence of modern architecture is due to a sharp increase in the number and types of houses being built. Second, it is because industrial development brings new building materials to the construction industry, which may make the appearance of buildings look significantly different from that of ancient buildings. The third point is the formation and development of structural science, because with the increase of time, various theoretical knowledge has also been perfected, and human beings can also try other kinds of buildings.

In general, this paper compares the characteristics and shortcomings of ancient and modern buildings, and, on this basis, investigates and studies their materials and structures, and finally gives suggestions on the future architectural style, for instance, how to integrate ancient and modern buildings by learning from each other's advantages and discarding their shortcomings. Nowadays, extreme weather conditions are increasing due to global warming. By studying the combination of ancient and modern architecture, this paper can give some enlightenment on the architecture field to help effectively avoid the trouble of extreme weather in the future and improve the safety of the building.

2. A comparison between ancient architecture and modern architecture

2.1. Comparison of differences

Undoubtedly, ancient architecture and modern architecture are different in several points and this section sorts them out. The first and most obvious one is the difference in building materials. Most of the materials of ancient Chinese buildings are natural or hand-made such as earth, wood, brick, tile, ash, sand, and stone. Modern buildings are mainly constructed using iron, steel, reinforced concrete, etc. The second point is their different structure construction. Ancient Chinese architecture is based on the frame structure courtyard group layout. The courtyard group layout has a simple organization principle, consisting of a number of single buildings and some corridors, walls, and other surrounding courtyards, while modern Chinese architecture is designed to meet the functional requirements of modern people's production and life. The exterior shape of the building is simple, bright, fresh, and generous, and most of them are high-rise buildings with a small footprint. The third point is the difference in space use. Specifically, ancient architecture usually takes full account of cultural factors and considers how to reflect humanistic characteristics. In terms of space, more emphasis is placed on implicitness. However, as far as modern architecture is concerned, the content considered tends to be how to enrich the functions of buildings and how to make full use of land resources to achieve optimal architectural goals. It can be seen that modern architecture has certain limitations in terms of space utilization. Through the above analysis, it can be seen that in order to achieve the integration of modern and ancient architectural design, not only humanistic factors and cultural characteristics but also local regional characteristics should be considered. In addition, it is also necessary to ensure that the architectural design is reasonable and the components are durable. From the perspective of spatial form, to realize the integration of the two, on the one side, it is necessary to make full use of the current land resources; on the other side, it is important to get the best out of the value of resources, so as to ensure a more reasonable spatial layout, as well as the comfort and privacy [1].

2.2. Comparison of advantages

Ancient architecture and modern architecture have their own unique advantages. Starting from ancient architecture, the most prominent feature is the pursuit of practicality as the basic feature of space beauty. In addition, the combination of space, form, color, and decoration is also an important point that the ancient people paid attention to when creating the building. Ancient Chinese people mastered the technology of making bricks and tiles, so a new kind of building combining brick and wood came into being. This was the leading construction technology in the world at the time. Chinese painting, carving, and other technologies have been perfectly integrated into it, creating an architectural system with Chinese characteristics [2]. At the same time, China is also a country that attaches great importance to thoughts. Therefore, in ancient times, architectural symbols that reflect the spirit of the nation are often

an expression of emotions. When people see a certain building, they may associate it with the national spirit.

In contrast, modern architecture, due to the lack of land resources, pays attention to the building function, so as to ensure that the building can play its maximum use after construction. Nowadays, modern architectural technology is constantly combined with related technical disciplines, which improves the architectural discipline system. In the past, architectural creation was a traditional way of engineering experience. With the maturity of modern material and technical systems such as structure, materials, and equipment, due to their combination with architectural disciplines, architectural creation gradually became systematic and scientific [3]. People gradually improve their quality of life and pay more attention to the enjoyment of life. Therefore, people's various requirements in life must be considered when designing buildings. Requirements include safety, durability, practicality, earthquake resistance, etc., so as to improve the style and function of modern buildings in the existing buildings. At the same time, modern architects also pay attention to the economy of buildings. In addition, contrary to ancient architecture, modern architecture advocates the combination of architectural beauty and the use of function, materials, and structure.

2.3. Comparison of disadvantages

Ancient Chinese architecture also has its own shortcomings. Because ancient Chinese architecture is a wooden frame system, it performs poorly on fire resistance. There are many cases of buildings being on fire in Chinese history. The buildings include the Forbidden City, the Old Summer Palace, etc. Besides, wooden buildings are not corrosion-resistant [4]. Second, the construction period is long and there is a need to spend more manpower. According to experience, the wood structure passed down is exquisite. Although there are drawings, many of them are difficult to imagine by modern people. Moreover, large buildings have strict requirements for the wood structure.

Although modern buildings do not have the shortcomings of ancient buildings, it is inevitable that there are other defects existing. After investigation, compared with ancient buildings, modern buildings have higher floors, but the height of the floors is relatively lower than that of ancient buildings. The harmful dust and gas in the environment are concentrated in about two or three meters, so modern buildings have less daylighting and less indoor air circulation. Because the space area is not large enough, the individual activity scope is small. This may bring residents a feeling of depression. Second, modern architecture lacks a reasonable layout. Due to many unreasonable architectural style problems, modern architecture makes many places lose their original charm. In Beijing, the capital city of China, there are a series of problems such as the unreasonable layout of buildings, zipping project problems, urban water problems, and vehicles nowhere to park. At the same time, Beijing is a city with both modern elements and traditional classical elements. If the old buildings are demolished, it is extremely disrespectful to history.

3. Integration of ancient architecture and modern architecture

Since both ancient architecture and modern architecture have advantages and disadvantages, it is a good approach to combine the advantages of the two to retain the architectural characteristics of ancient times without losing practicality, complementing each other.

3.1. Combination of materials

Ancient building materials are mainly natural stone and forest. Modern buildings are mainly composed of composite materials such as concrete and steel, which have better performance. Some ancient building materials are not durable and some modern materials lack beauty. Therefore, modern materials can be wrapped by materials that have a similar texture to ancient materials to retain the beauty of ancient architecture while speeding up production without destroying nature. This can be said a good way to combine the advantages of the two.

3.2. *Combination of styles*

First of all, structural integration can be carried out. Modern architectural design has different degrees of innovation in terms of structure, performance, shape, and other aspects. While actively applying various new construction materials, there are many new bright spots in the internal structure and related design of the whole building [5]. At the same time, Chinese-style architecture is also very popular at present. From this point of view, modern people still consciously retain the traditional Chinese architectural culture. Through the integration of modern elements and traditional elements, a new architectural structure is constructed. For Chinese-style buildings, whether in lighting or ventilation, there are great limitations, which do not meet the requirements of modern people. In the new Chinese architectural design, through the application of screen, window lattice, and other structures, the whole building has a stronger sense of hierarchy, giving people a thick but not heavy, stylish and not depressed feeling, which is a combination of the design of modern architecture and ancient architecture. Ideas can also be integrated, as the architecture can also reflect the ideas of the time. In the early days of the founding of the People's Republic of China, under the influence of historical background and other factors, some large palace-type roofs were constructed to show the national architectural characteristics, that is, the traditional wooden structure was abandoned, and the palace-type roofs were installed with a combination of cement and brick. After stepping into the 1980s, the architectural design of China gradually began to develop vertically. During this period, some people believed that three-story houses were no longer in the category of Chinese-style architecture, which restricted the development of modern architecture. Some designers integrate the good design concepts of ancient buildings and design low-rise buildings, which promotes the development of modern architecture to a certain extent [6]. In addition, the construction of traditional buildings in ancient times in China pays attention to the unity of nature and humans. In other words, the perfect integration of architecture and nature is being concentrated on, echoing with the local environment and climate. China has 56 ethnic groups with a vast territory, and each ethnic group and region also has its own regional architectural style. For example, in Suzhou, buildings are mostly built near water. There are many kinds of bamboo in Suzhou Gardens, but in the northwest of China, some villages can not see the situation of the house, because many villages are living downward in a basement. In minority areas, there are tong buildings, Fujian Hakka earth buildings, garden buildings, and other architectural forms. These architectural forms adapted to local conditions can be used for reference and can be learned by modern architectural design [2].

4. Conclusion

To sum up, this paper analyzes the advantages and disadvantages of ancient and modern architecture, as well as how to integrate them to maximize the role of architecture and cater to modern people's life concepts and habits. It is undoubtedly that combining the design of modern architecture and ancient architecture is a good approach, which is not only a kind of innovation but also can broaden designers' thinking of architecture. Although there are differences existing in materials, structure, space utilization, and other aspects between ancient and modern buildings, the advantages of the combination of the two can be maximized if the unique aesthetics of ancient buildings and the safety and practicality of modern buildings are rationally combined according to different needs, and the integration of materials and styles can be further carried out. Nowadays, there have been many excellent works of the integration of ancient and modern architecture, which are better than modern architecture in terms of material and beauty. This reflects the benefits of the combination of the two. Future research can focus on the study of new materials and gradually reduce people's living costs.

References

- [1] Ni, M. D. Z. (2023). Research on the integration strategy of modern architectural design and ancient architecture. *Shoes Technology and Design*, (01), 146-148. DOI:CNKI:SUN:ZWX E.0.2023-01-049.
- [2] Chen, J. H. and Li, J. C. (2019). The reference analysis of ancient Chinese architectural characteristics on modern architectural design. *Popular Literature and Art*, (04), 102-103.

- [3] Yang, Y. (2018). On the classification and characteristics of modern architectural technology. *Science and Technology Innovation* (33), 82-83.
- [4] The advantages and disadvantages of modern Chinese architecture. (2017). Accessed from <http://www.civilcn.com/jianzhu/jzlw/jcjl/1501466722325085.html>.
- [5] Fu, M. X. (2020). The influence of modernist architectural style on modern Chinese architectural design. *Residence* (17), 3-4.
- [6] Chen, Y. M. (2021). On the mutual integration of modern architectural design and ancient architectural design. *Interior Architecture of China*. Accessed from <https://www.pressreader.com/china/interior-architecture-of-china/20210315/286057714349976>.