

Analysis on Historical Buildings of Wuhan University

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Abstract—As a key national heritage conservation history architecture units of Wuhan University, They have their own unique historical value and artistic value, they are the excellent model of Chinese universities building. Undergoing some important historical periods, they will still be distributed with the past glory of the record through the history of it. The historical buildings of Wuhan University in China are also building a landmark in the history. They have amount of inspiration and an example of the role on how to combine the traditional and the modern, nationalization and internationalization in the development of architecture in China.

Keywords—Wuhan University; historical buildings; architecture history

I. INTRODUCTION

Wuhan University surrounds the East Lake waters and sits on Luojia Hills. In the campus, the Chinese and western palace-style early buildings are elegant, lofty and magnificent. The terrain in the campus is undulating and patchy, and the unique topographical conditions have laid the foundation for the formation of the landscape of Wuhan University. The well-designed campus of Wuhan University is renowned for its beautiful scenery and rich culture, especially its unique historical buildings. Most of the buildings have been in use after they were built in the 1930s. Among them, there are 26 buildings in 15 places with a national construction area of 54054 m². The historical buildings of Wuhan University have their unique and precious historical, scientific and artistic values. At the beginning of the 20th century, when new materials and new technologies such as steel structures, concrete frame structures, glass atriums, and triple-stranded arches were still in the exploration stage in the Western architectural world, these new materials and new technologies have been successfully applied to the buildings of Wuhan University. On the one hand, campus buildings have strong traditional Chinese architectural features; on the other hand, the application of new technologies and materials of the West makes them more robust and novel than traditional buildings, profoundly affecting the development of modern Chinese architecture in China. It is of the milestone significance in history. At the same time, it has certain enlightenment for the combination and development of tradition and modernity, nationalization and internationalization in the development of Chinese architecture.

Based on the above analysis, Wuhan University is the earliest national university established in modern China. Its historical buildings are important representatives of Chinese historical architecture. This paper analyzes the architectural characteristics of Wuhan University from three aspects, namely, the construction and evolution of the historical building of Wuhan University, the characteristics and design methods of the historical building of Wuhan University, and the enlightenment of the historical building of Wuhan University to the exploration of China's architectural development. Through literature analysis, historical research, comparative research and other research methods, the historical buildings of Wuhan University are important parts of Chinese historical buildings, and this research method of viewing the small as the big also has a very important value and significance for the research of Chinese historical buildings.

II. THE CONSTRUCTION AND HISTORICAL EVOLUTION OF THE HISTORICAL BUILDINGS OF WUHAN UNIVERSITY

The campus of Wuhan University is a masterpiece of modern Chinese campus buildings. In 1928, with the advocacy of Cai Yuanpei, the former Wuchang Zhongshan University was converted into the National Wuhan University. Cai Yuanpei personally proposed and appointed geologist Li Siguang as the chairman of the "New School Building Equipment Committee of National Wuhan University". In October 1929, the Construction Equipment Committee officially hired American architect F.H.Kales as the new school building architect, and hired a friend and classmate Miu Lien at MIT as an engineer to supervise the construction of the new building. The construction of the project was undertaken by the well-known Han Xiesheng, Yuan Ruitai, Yongmaolong and other construction plants and Shanghai Liuhe Company. In March 1930, the groundbreaking work was completed in six years. The main buildings include five college buildings, namely, literature, law, science, engineering and agriculture, as well as libraries, gymnasiums, student dormitories, teachers' residences, and the Water Tower of Luojia Hills. The campus covers an area of about 213.33hm², with a total of 68 buildings, 30 projects. Such a vast architectural activity is second to none in the history of modern Chinese architecture. The project was divided into three phases: the first phase (March 1930-January 1932): 13 items, such as, liberal arts colleges, science colleges, male students' dormitory, student dining

room and club, first and second residential areas of the faculty, sports grounds, national Wuhan University archway; the second phase (February 1932-July 1937): mainly including the library, gymnasium, Huazhong Hydraulic Engineering Laboratory, Water Tower of Luojia Hills, internship factory, power plant, part of living room, law school, science college (expansion), engineering college, agricultural college (not completed), etc., a total of 17 projects; the third phase: medical school, auditorium, the general office (not built due to insufficient funds). [1] From the basic completion of the Wuhan University campus in 1936 to modern times, it has experienced several important historical periods. In different historical periods, historical buildings have undergone varying degrees of destruction and renovation, and they have also witnessed the history of Wuhan University. During the War of Resistance Against Japanese Aggression, Wuhan University was forced to move westward to Leshan, Sichuan. The campus of Wuhan University became the military command center of the national government to lead the national war. On October 26, 1938, in Wuchang, the Japanese army set its headquarters on the campus of Wuhan University. During the Japanese occupation, the watchtower was built at the top corner of the library building. The male dormitory was used as a hospital, and the liberal arts, science, and engineering colleges were used as offices. During the Anti-Japanese War, the appearance of the buildings in Wuhan University was relatively intact. After the founding of the People's Republic of China, the state carried out a series of renovations on Wuhan University. In order to adapt to the development of Wuhan University, a number of new buildings were built, such as the physical and biological buildings on both sides of the original site of the Great Hall, as well as Guiyuan and Meiyuan with a traditional national style. The biological specimen building between the college of science and the biological building was built during this period, but the architectural design of this period begun to ignore the coordination of the overall style of the campus building.

In 1993, the Wuhan Municipal People's Government announced that the early historic buildings of Wuhan University were excellent historical buildings in Wuhan. On June 25, 2001, the State Council of China officially listed it as the fifth batch of national key cultural relics protection units. In July 2000, Wuhan City delineated the protection of Wuhan University's historic buildings from 20 to 48 meters around the building. In recent years, in order to better protect the historic buildings of Wuhan University, the school has also adopted a number of protection measures, adheres to the principle of repairing the old and maintaining the original.

Today, the unique architectural features and campus landscape make Wuhan University become one of the most beautiful universities in China, attracting students and visitors from all over the country. As one of the oldest universities in China, Wuhan University inherits nearly 100 years of outstanding historical buildings and unique cultural style. The 26 early buildings in the school are listed as "National Key Cultural Relics Protection Units".

III. ANALYSIS ON HISTORICAL CHARACTERISTICS AND DESIGN TECHNIQUE OF HISTORIC BUILDINGS OF WUHAN UNIVERSITY

The campus of Wuhan University has a lot of ups and downs. The American architect F.H.Kales used the way of adjusting measures to local conditions in the overall planning layout. A low-lying land surrounded by mountains on three sides and opening to the west is regarded as the sunken central garden and sports field of the campus, and the main building complex is arranged on three sides of the hillside, forming a complex of rich levels, and paying attention to the technique of symmetry of the central axis, which conforms to the aesthetic law of traditional Chinese buildings. The group layout of the campus planning of Wuhan University utilizes the orientation of the mountain and the depression, and is processed into a building with the east-west direction as the main axis and the north-south direction as the auxiliary axis. The large-scale buildings of the large auditorium are placed on the west end of the hill as the end of the axis and the climax. In the design of the building, F.H.Kales used design techniques such as multiple reconstruction, grafting and abstract simplification in order to affirm the national differences and the historical tendency of buildings. The library as the spiritual symbol of Wuhan University is the tallest building in Luojia Hills. The exterior is decorated with Chinese traditional features, and the top tower is octagonal and sturdy. There is a heating chimney on the roof, a meteorite in the south corner, and a small tower in the north corner. The guardrail is decorated with the left and right hooks and the central double dragon. It is a masterpiece of the designer's theory and skills. The early adoption of new structures, new materials, and new technologies (reinforced concrete frames and steel truss hybrid structures) in the history of modern Chinese architecture is a success of the Chinese classical architecture, reflecting the spirit of the times. The student residences are built on the slopes, arranged in a line, and the roof is connected to the front area of the library. It is also designed by the designer to create the terrain. The two-unit dormitory has 95 steps, which is the path of the library teaching area and the main staircase of the dormitory. The liberal arts building and the law school building are located in the left and right sides of the library and are the embodiment of the "literacy left and Wushu right" in Chinese traditional culture. The roof of Literature College uses a raised angle, being light and active and symbolizing the rhythm of flying; the roof of the law school uses a flat angle, being solemn and expressing the solemn and solemnity of the law. On the hilltop of the two wings of the auditorium, green glazed tiles, square double-eaves and four-sloping roof of the school of engineering building and the dome of the school of science building are respectively arranged. The square wall of the main building has obvious corners. As the traditional wall of China is in the form of inclined surface, the architect used the technique of cutting the four corners of inclined wall with simple treatment, and made use of the visual error caused by the contrast to form the illusion of wall surface, revealing the verve of traditional Chinese architecture. These are some of the ways to lose the traditional shape without losing the traditional meaning. On the eaves of the College of Engineering, there are "Imperial

Riding Chickens" and "Kissing Beasts", which imitate the practice of Chinese imperial palace architecture and have the meaning of fire and rape. In the design of the main building of the science college, the method of multi-reconstruction of the eastern and western architectural culture was adopted. The octagonal wall and the reinforced concrete dome (20m in diameter) were used to echo the square wall and glass roof of the engineering school in the south. It reflects the concept of fitting between square and circle ducts in the traditional Chinese concept. With the help of the mountain body and the momentum, the individual buildings are intertwined, high and low, forming a group of magnificent and well-organized buildings.

IV. THE ENLIGHTENMENT OF HISTORIC BUILDINGS OF WUHAN UNIVERSITY ON THE EXPLORATION OF CHINA'S ARCHITECTURAL DEVELOPMENT

Every building or building group is a mapping of its time and social spirit. As Rykwert puts it, "there is no building that has no historical support." [2] Ruskin also believes that "architecture should be an embodiment of a country's politics, life, history and religious beliefs." The historic buildings of Wuhan University also carry the ideology of society in the 1930s. In the design of the building, F.H.Kales organically blends traditional Chinese architectural culture with Western classical architectural civilization. From the overall configuration style to the decorative parts, the architectural decoration and the broad traditional Chinese cultural connotation fully embodies the characteristics of the integration of construction art with science and technology and historical region. The large roofs with various shapes, the glazed tiles filled with charm, and the flying rafts show the reflection of the historical architecture of Wuhan University on the style of the times. In terms of architectural decoration, different decorative techniques were used according to different functions of buildings and even different disciplines, revealing the communication and integration of Chinese and western cultures in the society at that time. The most commendable thing is that F.H.Kales' recognition of ethnic differences, respect for time, space and geographical limitations, and the application of the latest construction technology at that time made the architecture of Wuhan University reflect the characteristics of both "traditional" and "modern".

V. CONCLUSION

Chinese culture is the only culture in the world that has been developing for thousands of years. Chinese architectural history is an important part of the history of world architecture. China has not gone through the Western-style philosophical and religious reflections, and there has been no Renaissance-style exploration and thinking. Therefore, Chinese culture always encounters the obstacles brought by traditional culture on the road to modernization and the future. The bad habits of obedience and no change have also directly affected the development and innovation in Chinese architectural creation. The mediocrity of aesthetics as a historical accumulation has a deep-rooted influence on Chinese architectural culture. Under such a

large environment that emphasizes the ritual architecture space combination, the unified architecture system, the pursuit of harmony, stability, and the beauty of silence, it is difficult to create innovative architectural creations. The historical architecture of Wuhan University uses the combination of tradition and modernity, nationalization and internationalization, adopts the advantages of Chinese and Western architectural forms in the development, combines the beauty of classical and modern architecture, and opens up the modern architectural style, which has certain enlightenment on the combination and development of modernization, nationalization and internationalization.

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