ANALYSIS OF WESTERN WOODEN STRUCTURE TECHNOLOGY'S INFLUENCE ON YANGZHOU WOODEN ARCHITECTURE IN MODERN TIMES

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ABSTRACT

Wooden construction architecture had a history of more than three thousand years in ancient China. Wooden construction was used in from palaces, temples and gardens, to prince's palaces, vernacular dwellings and folk public buildings. During the long history of the development, some changes happened in the order of building components, but such changes were not fundamental.

Post and lintel construction order, column and tie construction order, and log cabin construction order are all accumulations of constructing experience, so no revolutionary breakthrough happened. Compared with Western construction, traditional Chinese wooden construction architecture is wasteful in materials. Besides, the unitary construction shape could not satisfy the needs of the social development of modern times.

However, in the West, with the scientific development and progress, not only traditional wooden truss technology, but also wooden construction dwelling technology have developed from experience to science, and have become the mainstream of global contemporary wooden construction development.

Yangzhou city has an urban history of about 2500 years, and is among the first group of 24 historic cities authorized by the government of China. It has been one of the central cities in economy and culture in the history of China.

Benefiting from the canal transportation and the accumulation of wealth obtained through salt business, the urban construction, dwelling and garden construction were on a high level, so Yangzhou traditional wooden construction technology remained comparatively mature.

Until now there still exist old buildings of about 500,000 square meters of Ming dynasty, Qing dynasty and Republican China, among which about 6,000 have been maintained well. Some buildings of high historic value, artistic value and academic value have been classified into different levels’ of cultural relics protection units, including 16 national key cultural relics protection units, 21 provincial level cultural relics protection units, 171 municipal culture relics protection units and 37 historic architecture buildings.

These traditional buildings mainly adopted traditional Chinese wooden construction technology, but among some traditional buildings in modern times, there existed obvious influence of Western wooden construction technology.

First of all, the influence is embodied in the complete transplant of Western traditional wooden construction technology to Church architecture in Yangzhou. Though Yangzhou was not an open city, the Western influence on Yangzhou architecture was evident, such as Church hospital (Today’s Subei Hospital), church school (today’s Yucai Elementary School), church (Emmanuel Church) and missionary’s dwelling (Today’s Western Style House, No.6 in Xiapu Street)(See Figure1-5).

Though neither the number nor the scale of the remaining buildings is great, the quality is well preserved, and the buildings are still in use today and become a very important part of Yangzhou traditional architectural relics.

Secondly, the influence is embodied in the combination of Chinese and Western wood construction technologies. A lot of buildings of Republican China adopted modern Western wood roof truss technology in bent while continuing to use traditional Chinese wooden construction technology.

Thirdly, Western technology was actively used in modern business, service and industrial buildings. Because these buildings need continuous lower story large space or multi-story large space, and even with clerestory on the roof,
they usually gave up traditional brick-wood construction, but used masonry-timber structure, that is, with brick wall and brick column to carry the building weight in the outside, with wood column, wood beam and wood floor in the inside, and with western wood truss on the roof.

Finally, there is the influence of Western wooden construction on decoration details, such as hanging fasciae, stair railings, and corridor railings.

This paper summarizes the differences between Chinese and Western wood construction technologies on the basis of reviewing the development of Chinese and Western wooden construction technologies, and tentatively analyses the influence of Western traditional wood construction on Yangzhou modern architecture and the causes from the perspectives of society, economy and culture. It points out that the fundamental way out of future wooden construction technology lies in learning, integrating and developing Western contemporary wooden construction technology, and in the combination of science and experience.

Figure 1: Emmanuel Church (built in 1924)

Figure 2: Church School (built in 1888)

Figure 3: Yangzhou Bath House (built in 1928)

Figure 4: Jiyuan Inn (built in 1912)

Figure 5: Workshop of Yangzhou Seed Station (built in 1917)