



**Concept and Practice of Traditional Garden Heritage
Conservation: A Report of 2020 Asia-Pacific Region Historic
Buildings Protection and Restoration Technologies Senior Talent
Seminar**

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ABSTRACT

In December 2020, the WHITRAP-Suzhou Branch jointed Xi'an Jiaotong-Liverpool University that successfully held a 9-day "2020 Asia-Pacific Region Historic Buildings Protection and Restoration Technologies Senior Talent Seminar and Yangtze River Delta Region Classical Gardens Talent Seminar." During the event, Chinese professors and overseas scholars gave a series of academic lectures in the on-off line interactive way to 30 trainees from all over China. Furthermore, through the field inspections and in-depth on-site workshops in classical Suzhou Gardens, the participants discussed the garden historiography and the meaning of landscape painting in the gardens, and summarized the skills and principles for rockery-making in the gardens. Moreover, the participants also presented the principles for garden heritage conservation. The Internet-of-Things-based method was introduced as an effective tool for monitoring the health of classical gardens. Although this training course was during the prevention and control of the COVID-19 Pandemic, it still demonstrated the promotion of the Yangtze River Delta region in heritage conservation, and provided a reference to the heritage training, promoting the Suzhou Gardens history research, and the interaction between historical research and heritage value.

Keywords: Classical Chinese Garden, garden historiography, rockery making, heritage conservation, Suzhou, China

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1. INTRODUCTION

The UNESCO World Heritage Institute of Training and Research Center in the Asia-Pacific Region (WHITRAP) is the first non-profit international organization in the field of heritage protection established by UNESCO in a developing country. The center is jointly organized by academic institutions and government agencies in three Chinese cities: Beijing, Shanghai, and Suzhou, with branch centers. WHITRAP's training and research activities have their own focus. The Beijing branch focuses on the declaration and protection of natural heritage, including archaeological excavations and cultural landscape management. The Shanghai branch is committed to the declaration and protection of cultural heritage, including the protection of historic buildings, and management of historical sites and cultural landscapes. The Suzhou branch was established in May 2007, mainly to carry out senior talent training and academic research activities of heritage management and historic buildings restoration technologies. At the end of 2012, the WHITRAP Historic Buildings Conservation Alliance and Research Association was established in Suzhou, which is composed of well-known historic buildings protection experts and scholars in the Asia-Pacific region, as well as some related units and entrepreneurs engaged in historic buildings restoration. The Association's scope and aims are to be the international connection that is conducive to government departments, universities, scientific research institutions, and historic reconstruction enterprises, on the conservation, consultation, scientific investigation, and related academic activities.

In December 2020, WHITRAP-Suzhou and Xi'an Jiaotong-Liverpool University jointly and successfully held the 9-day seminar themed "2020 Asia-Pacific Region Historic Buildings Protection and Restoration Technologies Senior Talent Seminar and Yangtze River Delta Region Classical Gardens Talent Seminar." The seminar was composed of over 20 experts from the United Kingdom, Italy, and China. The theme was

"Conservation of Built Heritage and Local Sustainable Development-Suzhou Gardens Research History and Methods, and Heritage Values and Dimensions." The heritage site managers, and conservation practitioners and researchers provided lectures and case studies on various heritage conservation models. At the same time, the 30 selected trainees explored the Lingering Garden (Liu Yuan), Tiger Hill (Hu Qiu), the Master-of-Nets Garden (Wangshi Yuan), the Garden of Cultivation (Yi Pu), the Humble Administrator's Garden (Zhuozheng Yuan), Joyous Garden (Yi Yuan), the Mountain Villa with Embracing Beauty (Huanxiu Shanzhuang), Canglang Pavilion, and others, to have a comprehensive understanding of the maintenance and management of the gardens. Considering the prevention and control of the COVID-19 Pandemic, the organizer opened an online real-time broadcast, allowing Chinese teachers and students, as well as foreign scholars who could not attend at the scene, to interact remotely.

2. LECTURES AND ACTIVITIES

On the first day of the event, Professor Zhu Guangya from Southeast University of Nanjing gave an opening speech, titled "Theoretical Thinking on Traditional Garden Heritage Conservation in China" [Figure 1].



Figure 1. Prof. Zhu Guangya's opening speech

He suggested that the principles of Chinese garden heritage protection involved three practical aspects: (i) differences between garden heritage and architectural heritage restoration; (ii) comparisons of heritage

conservation methods for classical Chinese gardens and Western gardens; (iii) the last but most important aspect is the essence of “maintenance” and “restoration” of heritage. Professor Zhu also put forward a range of public policies that may contribute to the conservation of gardens. In addition, the authenticity of a garden is an important aspect of heritage conservation, in particular the inheritance of artistic atmosphere in the garden is the core of authenticity that contributes the vitality of gardens.

Prof. Stanislaus Fung, an active scholar of Chinese gardens, presented online on the topic of “Historiography of Chinese Gardens: Implied Questions and Choices.” He argued that a critical reading of Chinese garden historiography was that Chinese gardens did not form a category in traditional Chinese bibliographies, and even 20th-century bibliographies of Chinese studies did not always feature that. Furthermore, he raised some broad epistemological questions about the value of visual evidence of gardens. This argument was based on his experience that some traditional gardens were short-lived. However, traditional Chinese literatures did not attempt to define the general physical characteristics or visual qualities of those gardens; on the contrary, they were regarded as a logical part of life process. Therefore, the “seeing experience” was based on a cultural norm that is becoming a victim of cultural prejudice, a fallacy of visual evidence, which today has become the main method of historic study of traditional Chinese gardens. In other words, the historic study of Chinese gardens has been based on the design standards of Western gardens, which provides a model for the development of Chinese garden historiography, and the development of contemporary landscape architectural research. Thus, the historic study of Chinese gardens seems to contribute to an element of the Westernization of China.

Dr. Stephen Whiteman, from the Courtauld Institute of Art at the University of London, has been working on the connected histories of landscapes and garden spaces in the Qing dynasty (1644–1911), with a focus

on the visual culture and cultural memory. He gave an online speech on the subject of representative gardens and imperial and literati gardens in Chengde of Hebei province, as well as the Jiangnan region, China. He demonstrated how the landscapes in early Qing dynasty seemed to be a medium to integrate and apply the emperor’s ideology, and presented his in-depth literature research on cross-cultural garden collections in the 1710s.

Tang Keyang, professor of Southern University of Science and Technology in Shenzhen, presented about the landscapes and gardens of Chang’an (today’s Xi’an) in the Sui (581–618) and Tang (618–907) dynasties. He stated that the artistic conceptions shaped by the gardens need to be separated from the physical spaces, just as the self-consciousness sometimes continues to be in the garden, but the physical body has come back to daily life. In the description of ancient Chang’an poem, “Looking to Chang’an,” there is a frequently appeared image, or a literary behavior, which is closely related to the historical morphology of Chang’an City. Professor Tang keenly captured the importance of this sense of geography, and the artistic conception contained in the gardens accompanied by poetic reveries and expressions, containing multiple elements of the city, history, and literature.

Professor Gu Kai, a scholar from Southeast University of Nanjing, has long been engaged in the historic research of Ming and Qing gardens. He interpreted the meanings of traditional landscape paintings, and pointed out that the gardens on the Yangtze Delta in the late Ming dynasty was not only the visual effect of the configuration of the botany, but also unprecedentedly enhanced the experience of tour in the gardens, which has an important impact on the garden space management. Drawing lessons from traditional landscape paintings may make one focus more on the appreciation and construction of “artistic environment” of gardens. Based on his historic research on the gardens in the late Ming dynasty, Professor Gu believed that making it look like a

“painting” had become the purpose of creating a garden and building a rockery. The principles of painting in garden-making was not established until the late Ming dynasty, and the pursuit and establishment of paintings prompted a major change in the garden-making of the late Ming, which were revealed in the following three aspects: (i) the treatment of various garden elements and garden styles had undergone important changes; (ii) the artisan’s painting ability had become an indispensable quality of requirement; and (iii) the garden-making had obtained clear evaluation standards. He also stated that the composition and scale of the garden form is still the prominent question today, which was initiated by Zhang Nanyuan, the master of rockery in the late Ming dynasty.

Mr. Fang Hui, a contemporary well-known garden rockery artist in Yangzhou, displayed his artworks of gardens across China, and summarized the skills and principles for classical Chinese gardens, including conceptual design, stones selection, rockery shaping, and botanic planning. He also presented the most important concepts and implementation of rockery in traditional Chinese gardens, such as “less is more as the artificial hill concept,” “stone selection and geographical characteristics,” “artistic fabrication for the hill,” and so on, which contribute to the universal inheritance of traditional gardens and the expression of regional cultural characteristics of stone-shaping as the essence of garden-making. For the integrity and authenticity of garden heritage, artificial hill is most valued in heritage conservation. Moreover, how to make the garden rockery safe during the process of restoration was also included in the lecture.

Professor Zhang Fengwu from Tianjin University gave a lecture titled: “Immortal Isles and Urban Forest in Imperial City: The West Garden of Beihai in Historic Beijing.” He reported the historic background of Beihai Park in Beijing, and the practical issues in the restoration project of Beihai Park. During the research process, his team used 3D laser scanning, electron microscope observation,

X-ray spectroscopy, and other scientific methods and technological tools to digitalize the garden rocks. After studying the appearance and characteristics of the rockery from Lake Tai in southern China, he concluded that the Lake Tai rockery in the Beihai Park is the “Genyue rockery,” which was a famous imperial stone for the Genyue Garden in Kaifeng of the Song dynasty (960–1279). From this, it can be determined that the traditional gardens of north and south China had the same art form of rockery-shaping and the same technique of rockery-piling [Figure 2].



Figure 2. Prof. Zhu Guangya and Prof. Zhang Fengwu is on-off internet discussion

Professor Feng Jiang from South China University of Technology in Guangzhou presented the topic “Tidal Movements, Lofty Trees, and Deep Ponds: Gardens in Guangzhou.” He believed that the garden is a dream, bringing a real experience in a trance. The garden is not only a heritage, but also connects with the spatial concept of modern architecture.

The seminar also organized on-site teaching in classical Suzhou gardens. In the Lingering Garden, Mei Hong, who is in charge of the maintenance and conservation of the Garden, described the state of maintenance technology and tourism management. While visiting the Humble Administrator’s Garden, Professor Lu Andong of Nanjing University suggested that the value of gardens should adapt to the evolution of ideology and respond to social needs, the pursuit of comfortable living, an

absolute requirement for the manifestation of citizenship, that is, the garden is a medium that provides its continuity. Through Tiger Hill's on-site workshop, Prof. Zhou Miao, from Zhejiang City University, explained that the normal state of preservation of wooden buildings is the cumulative result of several repairs in history, stacking and juxtaposing components from multiple periods. Dr. Liu Runen from the Shanghai Art Research Center presented online the restoration project of the Humble Administrator's Garden during the 1950s. Dr. Wu Hongde from Shanghai Jiaotong University investigated the process of reconstruction and evolution of Tiger Hill's cultural image and visual image through a series of case studies of the Ming and Qing paintings during the 14th–18th centuries, trying to respond to the question of how a place identity was established [Figures 3 and 4].



Figure 3. On-site lecture in the Lingering Garden, Suzhou, China



Figure 4. Dr. Wu Hongde's lecture in the Tiger Hill, Suzhou, China



Figure 5. Ms. Zhao Ting presented the Real-Time Monitoring and Warning System of the Tiger Hill Pagoda, Suzhou, China

Ms. Zhao Ting, a senior engineer of Suzhou Cultural Relics Protection Management Institute, pointed out that it was necessary to pay attention to technical research in the field of cultural relics conservation, and to establish a cultural relics technical system suitable for the characteristics of Chinese cultural relics [Figure 5]. In her speech, she gave a detailed introduction to the preventive protection system of Yunyan Temple Pagoda (Tiger Hill Pagoda): as early as 1979, the Suzhou Cultural Relics Protection Management Institute established the first-generation monitoring system for the Tiger Hill Pagoda, but its monitoring content was relatively simple and mainly relied on manual labor, which was far from achieving the effect of real-time monitoring and warning.

Since 2019, the Suzhou Cultural Relics Protection Management Institute began to establish the “Tiger Hill Pagoda Real-Time Monitoring and Early Warning System” to monitor and warn the various unfavorable situations of the Tower body and the surrounding natural and social environment in real time, to promptly remind staff to take control measures to ensure the pagoda is in good physical condition. Ms. Zhao Ting introduced that this monitoring and early warning system can realize two major functions of “real-time prediction” and “real-time early warning.” By installing the corresponding Internet of Things sensors on the Tiger Hill Pagoda, its health data can be

collected in real time, and then transmitted to the cloud platform via 5G. Finally, through the analysis and judgment of this big data, the health status of the Tiger Hill Pagoda can be evaluated in real time, 24 hours a day. At present, a total of 44 sensors have been installed on the Tiger Hill Pagoda, and the monitoring covers three aspects: the pagoda itself, the natural environment, and the social environment. Among them, there are six items for the Tower monitoring: (i) pagoda body tilt monitoring, (ii) vibration monitoring, (iii) force monitoring, (iv) tower foundation settlement monitoring, (v) ground soil uneven settlement monitoring, and (vi) pagoda temperature and humidity monitoring. There are five natural micro-environment monitoring items, including temperature, humidity, rainfall, dust, and light intensity. Regarding the social environment, it mainly monitors the unauthorized entry of tourists. The data show that since the “Tiger Hill Pagoda Real-Time Monitoring and Early Warning System” was completed and put into operation, the system has collected various types of monitoring data for more than 1.5 million times, without any abnormalities, and achieved the expected goals. Due to the uneven settlement of the foundation of the Tiger Hill Pagoda, Suzhou Cultural Relics Protection Management Institute has also established a “Tiger Hill Pagoda Deformation Monitoring System” to observe the changes in the Pagoda over a long period of time, to avoid irreversible damage caused by the excessive tilt of the tower. Ms. Zhao Ting reported that the team used the ground-based 3D laser scanning system, the target-free scanning method, and optimized point cloud data registration technology to collect high-precision, high-density massive point cloud data on Tiger Hill Pagoda, and realized “Contactless” surveying and mapping of historic and cultural relics. There collected more than 4.3 billion valid point cloud data, more than 10,000 textured photos, and detailed records of 3D geometric information and texture information of the ancient pagoda. She said that the difficulty of protecting the heritage of Tiger Hill Pagoda was that its

tipping point was unknown, and how much load it can withstand is unknown. From “passive rescue protection” to “active preventive protection,” with the help of digital models, simulation calculations were carried out in virtual space, and the monitoring and early warning thresholds were continuously revised based on the implementation data.

After dinner, a training session was also arranged for the trainees. Dr. Du Ming from Zhejiang SCI-Tech University, Dr. Zhu Lei from Tianjin University (remote), and Professor Duan Jianqiang from Inner Mongolia University of Technology, exchanged views with trainees about Yangzhou Gardens, Wuxi Jichang Garden, and Shanghai Yu Garden. In an online video, Prof. Simona Salvo from Sapienza Università di Roma in Italy, and Jin Xiaomin, a scholar of architectural history and theory, introduced an international case: Rome’s historic center as world heritage and the shaping of a heritage community. Scholar Yang Hui who travelled in Italy argued that heritage’s most important historic and cultural value was not in its source, but in the changing process from its origin to the present form, and its relationship with modern people’s lives.

As the chief planner and academic convener of the seminar, Dr. Dong Yiping, associate professor of the Department of Architecture and Design of Xi’an Jiaotong-Liverpool University, said that garden heritage resources are the carriers and important manifestations of local culture. How to promote local sustainability through the protection of built garden heritage is an important topic of historical and environmental protection in the current urban and rural development context. Traditional gardens with a long history are closely intertwined with historical towns, culture, and landscapes, and are also an important type of built heritage. Dr. Dong also claimed that since Suzhou classical gardens have been included in the UNESCO World Heritage List in 1997, there have been new changes in the concept and cognition of garden values in the past two decades. Therefore, through this

seminar, it was possible to promote the Suzhou Garden history research and the interaction between historical research and heritage value.

Although this training session was during the prevention and control of the COVID-19 Pandemic, scholars from inside and outside China still came to Suzhou to attend it, with efficient, convenient, and diversified exchanges across geographical and time constraints via the online platform, which met the cultural and educational goals of the UNESCO. It also demonstrated the promotion of the Yangtze River Delta region in heritage conservation, and provided a reference for future transnational education and training.

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