

Analysis of Huanxi Garden based on the textual research of ancient books and literatures

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Abstract. The creation of gardens was based on the visual experience of Song Dynasty landscape painting. The literati painting provides realistic depictions of gardens from various perspectives. Although the original objects of Huanxi Garden are no longer extant, there are available historical documents and image materials that serve as references for the garden's restoration work. Due to the restricted number of researchers and limited data available, we extracted the garden elements and reconstructed the plan based on the garden views portrayed in Song paintings and Song Ci poems. This enabled us to replicate the overall spatial design of Huanxi Garden and restructure its layout.

Keywords: Song paintings and words; Huanxi Garden; element extraction; pattern creation.

1. Introduction

The Northern Song Dynasty was a significant era in Chinese feudal history and the peak of ancient garden art in China. Gardens were created based on the visual experience of Song literati landscape painting. Literati paintings realistically depicted gardens from various viewpoints. During the Northern Song Dynasty, literati showed a keen interest in the art of gardens, resulting in the creation of numerous famous gardens, such as the Garden of the Ringed Streams. Wang Gongchen's (1012-1085) Huanxi Garden is renowned for its unique landscaping art and the people associated with it. Li Gefei's "Luoyang Famous Gardens" provides a more detailed description of the "Wang Kaifu Garden" in Huanxi Garden in historical documents. From researcher, Chen Congzhou's perspective, during the Zhou Dynasty, garden appreciation, and documentation were necessary, as they worked together to have a significant impact. There are only a few surviving ancient and modern famous gardens in China and foreign countries, which can be passed down through literature after their destruction [1]. Although Huanxi Park no longer exists, records and research on its descendants have been continuously growing. They are preserved in some of the surviving plane restoration work and literature, providing a solid foundation for the recovery of Huanxi Park. By examining the canonical documents of the Huanxi Garden in the Northern Song Dynasty, we can uncover the historical context, design features, and cultural significance of this ancient garden. This information provides a firm foundation for our comprehension of ancient Chinese garden art. This study not only enhances our understanding of ancient gardens but also facilitates the exploration of the essence of traditional Chinese culture and art.

2. Overview of Existing Restoration Studies of Circle Creek Gardens

For the examination of Huanxi Garden, the initial source of reference is Li Gefei's "Luoyang Famous Gardens" [2]. This work extensively delineates the general layouts of numerous renowned gardens and the composition of garden elements during the Song Dynasty. This work is deemed as the most invaluable reference for the study of Huanxi Garden. Later, researcher Zhang Yao conducted a thorough investigation of the above work, confirming and summarizing the features of Huanxi Garden, including its ownership, location, scale, and layout. Yao explored the garden's distinctive gardening pattern, reconstructed its plan, and ultimately analyzed its unique elements of gardening art and style, which shaped the overall portrayal of Huanxi Garden [2].

Simultaneously, the restoration of Huanxi Garden requires an examination of its historical context. The garden's construction was intimately tied to Wang Gongchen's personal experiences,

encompassing both political disappointment and the enjoyment of socializing with comrades in the garden. Notably, standing on the rooftop of the multi-view pavilion and Jin Hall gave the garden's owner a direct, inspiring vista. Wang Anshi, a former member of the imperial court, was considered an outsider and subsequently demoted to Yingtian Prefecture and later to Luoyang. As a member of the "Luoyang Stockbreeding Ying Society," he composed "Extravagant Ying Society," a poem expressing gratitude for his expansive surroundings teeming with streams. Despite his humble and solitary existence, he finds solace in the beauty of the land. There are numerous picturesque locations to observe, and the Wind and Moon Terrace offers an extensive view. The nomenclature of the edifice and platform in the Huanxi Garden mentioned in the record of "Luoyang Famous Gardens" is in accordance with it [2].

In his "History of Classical Chinese Gardens" publication [3], researcher Zhang Jiayi initially presented an outline of the garden plane layout of Huanshi Garden. However, this schematic is improved upon by Zhang Yao's restoration, which offers a more detailed and accurate representation. He also provides a three-dimensional bird's-eye view map that illustrates the entire spatial arrangement of Huanxi Garden. Nonetheless, some areas in the three-dimensional map require further scrutiny. Later on, the research on Huanshi Garden was insufficiently optimized, as compared to the study of Huaxi Park. As a result, the plan view lacks a certain level of accuracy. In general, there is currently no relatively unified three-dimensional restoration study of the Huanxi Garden. Moreover, there appears to be a lack of archaeological data and realistic depictions of the Garden in the garden maps that have been preserved to the present day.





As Song Dynasty artworks commonly portrayed realism, garden scenes in paintings reflected the people's interpretation and understanding of gardens during that period. The author has reconstructed a complete image of the Huanxi Garden during the Northern Song Dynasty through analyzing numerous garden scenes depicted in Song paintings. Based on the examination of Song paintings, it has been discovered that several of their painting texts align closely with the garden elements of the Huanxi Garden. Additionally, these texts showcase many intricate details of the physical buildings, aiding in the creation of a reasonably precise pictorial foundation for extracting and restoring the garden elements of the Huanxi Garden in the "Complete Collections of Song Paintings" - Wang Gongchen's "Garden of the Huanxi Garden".

3. Interpretation of the Elements of Huanxiyuan Landscape in Song Paintings

Currently, research on the Huanxi garden is limited due to the scarcity of visible artifacts. The only available description is from a book of paintings on the garden from the Song dynasty. However, scholars of the time criticized the arrangement of the garden as overly frantic, leading to repeated disregard [3]. The creation of private garden layouts is directly influenced by the size of the space, affecting the content and form of the garden. Notably, the methods used to paint mountains also differ. In two-dimensional landscape painting, vertical painting is done in three inches, while horizontal ink occupies a few feet. This distance from the white miles is itself considerable [4]. Due to the inappropriate building proportions depicted in Song-era paintings, the content lacks diversity and balance. Furthermore, there is a significant absence of garden elements that must be addressed. To create a comprehensive image of a Northern Song garden, we must rely on scenes of camping and depictions from ancient literati paintings. It is remarkable that a vast collection of painting materials and documents from the "Complete Collection of Song Paintings" has been preserved to this day. By examining the landscape elements from these paintings and interpreting the Song lyrics, we have been able to reconstruct a two-dimensional plan of the Huanxi Garden.

3.1 Pilled Stone Hill

Table 1. Appreciation of stones into paintings in Song paintings

Painting	Image	Author, name	Specificities
	boulder	Song Unknown Baby Playing in a Small Court	A corner of the garden as a backdrop; Paired with bamboos and grasses; Full of realistic style; Lake Taihu stones in inverted shape, delicate and transparent.
		Song dynasty, anonymous The Banana Shade Striking a Ball	A corner of the garden, for scenery; Serve with plantain; Realistic style; Fully show the lake stone "wrinkle, transparent, leakage, thin" characteristics
	rockery	Song Unknown Dog Playing	Garden accents, rockery as main feature; Wild chrysanthemums and marshmallows as supporting scenery; Fully demonstrating the natural beauty of the artificial rockery. Placement of stone sketching, as the main scenery;
	Grotesque rock	Unknown Auspicious Dragon and Stone	Strange modeling, like an auspicious dragon, takes the meaning of Fengxiang, giving the royal atmosphere; The structure is clear, exquisite and very ornamental.





During the Northern Song Dynasty, the art of painting had already reached a high level of maturity and was considered to be the best in the world. The depiction of mountains and rocks in the Complete Collection of Song Paintings mainly originated from landscape and boundary paintings. Three main types of rocks were depicted in Song paintings: natural rocks, rockeries, and rocks in their natural environment. Artificial rockeries and rocks are prevalent in the Huanxi Garden, primarily utilized for enhancing the scenic beauty. For instance, the artistic depiction of "Dog Playing Picture" with plants and embellishments. In the preface to the "Cloud Forest Stone Spectrum," Du Jiyang, a famous poet of the Song dynasty, reveals the cause behind the fascination of the literati and ink masters with the stones. As described in the anonymous work "Banana Shade Hitting the Map" and Su Hanchen's "Pavilion Infant Play" painting from the Southern Song Dynasty, the essence of the sky, condensation for the stone, and knotting with negative soil form a unique shape. Although strange, this shape can cultivate a thousand-year exhibition [5]. Stones are frequently depicted in literati paintings as a prominent feature of the landscape, often placed in a corner of the garden. This can be observed in works such as the anonymous "Banana Shade Hitting the Map" and Su Hanchen's "Pavilion Infant Play" from the Southern Song Dynasty. The garden landscaping will primarily feature a combination of unique stones and plants. Additionally, a superimposed stone landscaping technique, as demonstrated in Zong Zhaoji's "Xiang Long Shi Tu," will be employed to express the extraction of mountain elements. This involves singling out exotic stones for painting. Su Shi's career as a government official faced challenges, leading to his addiction to collecting dead wood and unusual stones. He believed that his collection of "a thousand oddities" reflected his desire for fairness and justice in the world. Song Zhaoji's Auspicious Dragon Stone portrays a beautiful lake stone with

intricate outlines and delicate highlights, crowned with a pool containing several planted flowers. "The auspicious dragon stone is situated in the south of the lake, adjacent to the blue Fangzhou bridge and opposite to Teng Ying. The stone carving depicts a coiled dragon, symbolizing good fortune, and features realistic details with no unnecessary embellishments." This artwork reflects the Song Dynasty's appreciation for naturalistic depictions of stones, with a focus on characteristics such as transparency, thinness, wrinkling, and perforation, as summarized in the table below.

3.2 Water Elements

Water is a crucial element in gardens and Northern Song dynasty paintings. It is believed that people with virtue appreciate mountains, while those with wisdom cherish water. The presence of water is required for a garden to be considered alive, and it adds a spiritual dimension to the garden. Water bodies are indispensable elements in gardens, as demonstrated in the Song painting collection, which categorizes them as either natural or artificial [8]. "The literati of the Song Dynasty appreciated the aesthetic value of natural water forms, as they believed those with wisdom loved water, which is rich in variety. Similarly, those with benevolence and virtue were thought to appreciate mountains [9]." The central water feature of Huanxi Garden is an artificial creation composed of a large pool, a meandering pond located in the southern region of the area, and a well situated within the courtyard. Other water features are also present, often designed in a curved or regular manner, to emulate the essential form of the man-made water features seen in the Jinming Pond of the Northern Song Dynasty, as depicted in Zhang Zeduan's "Jinming Pond Scramble Marker." Guo Xi, an artist from the Song Dynasty, demonstrated great attention to detail in his portrayal of water's form in *Linquan Gaozhi*. The text lacks context and doesn't align with any of the given principles or language variants. Therefore, the improved version is: The shape of the water to be deep and quiet, to be silky, to think of the ocean, to surround, to think of fat, to want to spray, to stimulate the shooting, to think of many springs, to want to flow quickly, to think of waterfalls straight into the clouds, to think of some puffs into the ground, to think of fishing hooks cha-cha-cha, to think of the grass and trees to be happy, to bring smoke and clouds and showy and charming, and to light up the valley and shine [10]. "It is observable that the Song dynasty paid meticulous attention to water management and conducted deep research on the subject. "Water is an essential and significant element in garden design and painting. Song paintings reveal that water can serve as the primary focus in creating beautiful and captivating scenery. In the Huanxi garden, for example, a large lake constitutes the central attraction that offers stunning views. Water can also be used as a secondary feature to complement other elements of the garden. "The construction of a water feature typically incorporates rock components, while the placement for a courtyard is often within a rock-delineated square pool. The Huanxi garden water system is the most expertly designed, with the stream thoughtfully collected and directed into the pool, complemented by the lotus flower as additional scenery. Near the water source, pavilions and Xuan should be built. The willow trees on the water's edge create a reflective harmony that not only enhances the water level but also unifies humans and nature. Observers can experience the changing water surface and spatial atmosphere and feel a connection with the environment. Refer to the table below for further details.

Table 2. Types of water bodies in the Complete Collection of Song Paintings

Natural water bodies		Artificial after bodies	
static	Dynamic state	static	Dynamic state
Spring Dawn at West Lake	Red Cliff	Jinming Pond Scramble	A Boat on the Lotus Pond
			

4. Creating the Spatial Pattern of Huanxi Garden in Song Lyrics

The proposed study analyses Song Dynasty garden design through a combination of Song lyrics, words, and paintings, as well as garden elements. Firstly, the garden space patterns are examined through these sources. Secondly, a people-oriented approach is taken to determine the overall outline and basic layout of the Huanxi Garden. This study aims to contribute to the restoration and cultivation of cultural heritage. The study analyses the cultural landscape in the traditional image by using the two-dimensional map schematic design method to extract garden elements. The overview covers the object relationship, characteristics, and patterns of the traditional landscape. Through distillation and analysis, the inner structure and spatial relationships of the landscape can be identified [11].

The garden elements depicted in the Song Painting Collection display a clear spatial relationship structure. This enables the restoration of the two-dimensional graphical representation of Huanxi Garden's landscape space to the Song painting process, allowing for a proper understanding of the artist's cognitive presentation of the spatial structure depicted in the picture. Simultaneously, the restoration of the process of extracting garden elements from the paintings helps to restore the entirety of Huanshi Garden's picture. Consequently, the extraction of garden elements from the diagrams is combined in accordance with the fundamental principles of spatial construction.

Huanxi Garden is the mansion garden of Nanyuan, and the general layout is as follows: two ponds are excavated in the south and north, each connected by a small stream, and the main buildings are concentrated on the big continent. The garden is covered with pine trees, juniper trees, and thousands of flowers and trees of various varieties. "Luoyang Famous Gardens" records that the pool is surrounded by a circular shape, with a pool in the south and a large pool in the north. On the central island, there are four areas: Jiehua Pavilion, Multi-view Building, Liang Xie and Jin Hall, and Fengyue Platform, each carrying out a detailed two-dimensional spatial design and reproduction.

4.1 Jiehua Pavilion Area

The Jiehua Pavilion is located to the south of the pool, near the southeastern corner of the pool area. It is a secondary building in the garden, tucked away from view. The water can be easily seen from its deep environment. The door of the pavilion is likely located on the garden's southern side and can be seen upon entering the garden or from the pavilion itself. The pavilion is a part of the garden scenery. It is built in a way that matches the garden's geography and natural surroundings, offering flexibility and harmony to the garden's overall atmosphere. It perfectly reflects the design concept of "embracing and integrating nature," making it a great addition to any garden landscape. The pavilion is located beside verdant mountains and forests, offering a tranquil water reflection. Moreover, it is well connected, seamlessly forming a beautiful atmosphere that encourages visitors to stop, stay, and appreciate the picturesque surroundings. Next to the Jiehua Pavilion, different landscaping features like mountains, pools, flowers, grasses, and trees are used. The main way of arranging plants is by planting lotus in the pool water, mulberry in the garden, and magnolias in groups. Additionally, peaches and willows are planted along the riverbanks. These techniques are also utilized in the pavilion's design. The pavilion has been carefully designed and placed using willow and other techniques. It is located next to a green mountain, amidst a lush forest, and the water reflects the surroundings. In spring, wisteria flowers and lotus fragrances make it the perfect spot to sit alone and enjoy the early sunshine. During summer and fall, you can listen to the rain hitting the bananas, which keeps you cool. And in winter, while sitting in the pavilion, you can admire the beautiful snow and plum blossom scene. Ji Cheng wrote in "Garden Metallurgy" about the significance of a zigzag corridor, stating that it should be curved and lengthy. The "Jiangnan Garden Zhi" also emphasized the importance of a corridor in connecting buildings and providing fresh air over the Liangshe around the zigzag. This local corridor acts as a channel linking Jiehua Pavilion to Liangshe, hidden in the forest. This shows that the corridor plays a vital role in garden architecture and landscape design.



Figure 1. Self-mapping of Jiehua Pavilion, Huanxi Park

4.2 Multi-View Area

To the south of the salt flats, there is a multi-view building. It was built for tourists to climb up and see the continent and the salt flats to the southwest. The multi-view building is located next to the water and has a platform for its base. The platform serves as a medium for the relationship between the water and the building. The original platform and the pier have a close connection and later became a place where people could be close to the water. It is an old poem. Near the water tower, there's a perfect spot to enjoy the moon. This area was designed to provide open space for people to play in the water. The main building is a multi-view structure combining the Jin Hall and the Mountain Room, with a unique roof design that adds interest. The buildings are arranged in architectural clusters with staggered heights, creating a light and elegant vibe. From a distance, the building's roof design creates a harmonious rhythm that evokes a sense of energy. When standing at the building's corner, one can feel the poetic sensations it inspires. The platform in front of the building is spacious and welcoming, with an open layout that encourages circulation. The use of barge or stacked stone, along with water features like ponds and ripples, creates a rich and inviting atmosphere.

The building has multiple views on the southern side showcasing various sceneries. From the top of the building towards the south, one can enjoy a distant view of Mt. Song Shao, Dagukuan Wanan Mountain, Longmen Yiquet, and a green ridged tree scenery layer that includes tall pines, cypresses, and clusters of shrubs with diverse species, shapes, and sizes stretching to the horizon.



Figure 2. Self-drawn diagram of the multi-view building at Circle Creek Gardens

5. Conclusion

Huanxi Garden is a big garden owned by a person in Luoyang during the Northern Song Dynasty. The usual gardening style of Song Dynasty gardens is used for its layout. The garden's overall structure is restored by bringing back landscape elements like rocks and ponds. The garden features are connected and work together to create a layout that reflects the style of "Luoyang Famous Gardens". The layout is well-planned, with a variety of forms and an energetic rhythm. These factors are used to create a two-dimensional design that can be used to restore the garden. In addition, the characteristics of the landscape in Huanxi Garden are analyzed and summarized, providing insight into the restoration of classical gardens and modern garden design. The rich culture of the Northern Song Dynasty had a profound impact on garden design and application. By studying literature and history, we can accurately depict the cultural features of that time, making the restoration process engaging and lifelike.

Given the limited restoration conditions, there is a shortage of relevant documentary records. This paper has numerous errors and irretrievable sections. The references to ancient literature are minimal, and the majority are historical theories. The restoration of the Northern Song Dynasty's Luoyang Huanxi Garden needs further historical and cultural study. Accurately restoring the garden's landscape, architecture, and cultural atmosphere will enable visitors to experience the lifestyle of that time and traditional culture.

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