

An Exploration of the Garden Architecture of Li Yu's Novel Twelve Towers

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ABSTRACT

Li Yu's Twelve Buildings is a chapter book from the Ming and Qing dynasties cultural element. The architectural originality of the buildings depicted in the text reflects the characteristics and development of garden architecture during that historical period. This study adopts a methodological approach that extracts garden architecture genes from the text of the novel using a landscape gene extraction method. The garden architecture genes are then categorised into three types: architectural genes, elemental genes, and plaque genes. The subsequent extraction of these three levels of existing garden architecture gene elements enables the creation of garden architecture gene mapping, facilitating the restoration of the design of the novel's Group-photo House scene. The gene map facilitates a more accurate and comprehensive reproduction of ancient garden architecture, thereby providing a method for the discovery of the characteristics of ancient Chinese garden architecture and the inheritance of garden culture.

KEYWORDS

Twelve Buildings, Garden Architecture, Genetic Mapping.

1. INTRODUCTION

The Twelve Buildings is a chapter book of short stories written by Li Yu, a famous writer and opera singer in the Ming and Qing Dynasties. The Twelve Buildings consists of 12 chapters, each titled with the name of a building, including a number of building names such as Hap Ying Lou, Xia Yi Lou and Feng Xian Lou. These buildings are not pavilions in the traditional sense, but may be water pavilions within private residences or temples open to the public. These buildings are not pavilions in the traditional sense, but can be water pavilions in private homes or temples for the public, and the different functional roles of the 'buildings' not only further the story, but also create different garden worlds.

The buildings in The Twelve Buildings have "originality", which is the artistic expression of Li Yu as a gardener of the garden architecture of the Ming and Qing dynasties, showing the humanistic feelings and lifestyle of the time through the artistic treatment of garden architecture. The layout, decoration of the buildings and the surrounding landscape all reflect the architectural features, garden space structure, cultural values and social life of the time.

Therefore, each pavilion carries Li Yu's aspiration and pursuit of a better life, and it becomes a classic work for understanding the characteristics of garden architecture and the human condition at that time.

2. OVERVIEW OF GARDEN ARCHITECTURE

2.1. Concept of Garden Architecture

Classical Chinese gardens incorporate a vital and indispensable element characterized by a diverse array of structures, including pavilions, corridors, halls, platforms, boats, and other architectural forms. These gardens are distinguished by several key features: a strong emphasis on the pursuit of natural beauty, a deep respect for the evocation of atmosphere, and a particular focus on the design principles that prioritize winding and contrasting layouts. These unique characteristics play a crucial role in the construction process of garden architecture. Pavilions serve a fundamental function, providing visitors with shelter from the wind and rain, as well as a place to rest and appreciate the surrounding landscape. As noted in the classic text "The Craft of Gardens," the term "pavilion" implies a space for pausing and respite[1]. This highlights the primary purpose of the pavilion, which is to offer visitors a venue for both observation and relaxation amidst the garden's scenic beauty.

The term "plaque" is considered by many to be equivalent to the "eye" of ancient architecture. In ancient times, the word "plaque" was also written as "flat", as stated in the 'Origin of Chinese Characters'. The "flat" in "flat, the Department is also, from the household register" also appears in the 'Origin of Chinese Characters'[2]. The term "forehead" is directly from the 'Origin of Chinese Characters'. In summary, a plaque is a tablet suspended above a door screen, specifically used to convey the meaning of scripture, emotions, and so forth. Conversely, foreheads are employed to denote the name and nature of a building. Consequently, the plaque can be defined as a hanging above the door screen, serving not only decorative purposes, but also reflecting the name and nature of the building, and concurrently expressing people's righteousness and literary art forms. In terms of form, those positioned horizontally are designated as plaques, while those positioned vertically are termed couplets or holding columns, also known as 'Tile Union'.

2.2. Context of Landscape Architecture

The symbolic meaning of garden architecture is widely employed in the design of traditional architecture and gardens. Its purpose is to convey profound connotations and symbolic messages through the use of symbols, patterns and decorative elements in the building. [4] Ancient garden architecture relied on a wide variety of allegorical symbols of expression to convey people's aesthetic aspirations and humanistic feelings.

2.3. Garden architecture courtyard

Ancient garden architecture is characterised by artistic principles of symmetry and balance, exemplified by the Forbidden City, which symbolises solemnity and stability. These principles are adapted to local conditions through landscape planning, as evidenced by the Humble Administrator's Garden and the integration of water elements. The focus on spatial changes in levels, the configuration of courtyard walls, corridors, and other spatial separations, underscores the artistic approach to landscape design. Additionally, a sparse and minimalistic approach is employed, with significant areas dedicated to dense layouts, leaving the rest of the space unadorned. The integration of borrowed scenery, landscape techniques, and other landscape elements is often employed to create an intoxicating space, showcasing the wisdom of the ancients and their refined aesthetic sensibilities. In the novel, the layout of the garden building is designed to propel the narrative progression, with the existence of the garden itself serving as a catalyst for the unfolding of the story.

3. RESEARCH METHODS

3.1. Gene mapping method

Gene mapping is a scientific illustration constructed according to the mathematical representation of the development state, movement posture, existence characteristics and evolution law of objective things[3]. Professor Liu Peilin and other scholars proposed 4 landscape extraction methods, including element extraction, pattern extraction, structure extraction and meaning extraction, and this paper refers to the scholars' landscape gene extraction method to conduct research. By coding and classifying the elements, patterns and other related features, the landscape architecture genes are computerised and arranged in order. According to the principle of typology and the theory of "n-level coding", the genes of different types of landscape architecture are divided into A, B, C three major categories of genes, and then the gene features are set in the order of 1-9 Arabic numerals after each category, and the indexes are set according to the content of the novel descriptions, to form a systematic three-level gene coding of landscape architecture. Gene coding.

3.2. Graphic and Textual Interpretation

The text refers to the study of garden architecture in the text of Twelve Towers, and the scope of the selection is all the parts about garden architecture in the chapter. Figure refers to the recovery image of Ho Ying Low in it through the law of gene mapping summary. Utilising both graphic and textual corroboration, an analysis is conducted of the garden architecture images corresponding to the novel's storyline. Ho Low Ying is taken as a case study to restore the images of the garden architecture scenes in the novel, and the influence of the novel and the garden images in the novel on the study of garden architecture is explored.

4. GENETIC ANALYSIS OF GARDEN ARCHITECTURE IN TWELVE TOWERS.

As outlined in the text on garden architecture in Twelve Towers, the gene categories, gene features and indicator descriptions are set separately. This includes the extraction of three gene categories (first-level indicators): architectural genes (A), elemental genes (B) and plaque genes (C). According to the text on the tree garden architecture depicted, the architectural genes following courtyard layout, building type, number of building floors and decorative artefacts are four major gene features (secondary indicators). (Specific as shown in the table below)

Table 1. Genetic mapping of garden architecture in The Twelve Towers.

Gene category (primary indicator)	Genetic characteristics (secondary indicator)	Indicator description (Tertiary Indicators)
A Architecturalgenes	1 Courtyard layout	A11 A house with two courtyards、 A12 A garden with a house、 A13 A single building
	2 Building type	A21 Water pavilion、 A22 High building、 A23 Garden pavilion、 A24 Nunnery、 A25 Thatched house
	3 Storey of building	A31one-storey、 A32three-storey
	4 Decorative Artifacts	A41 Embroidered、 A42 Toothpick Jade Shaft、 A43 Carved Fence and Curved Threshold、 A44 Bamboo Seat and Flower Ampuller、 A45 Famous Incense Burner、
B Essential Gene	1 Water system	B11 Surrounded by water on three sides、 B12 Pool water、 B13 Long embankmen
	2 Plants	B21 Flowering Bamboo、 B22 Infinite Lotus、 B23 Sophora、 B24 Weeping Willow
	3 Vignettes	B31 Walls、 B32 Stone pillars、 B33 Flying bridge
C Plaque Gene	1 Plaques of Buiding Names	C11 Ho Ying Low、 C12 To chin tower、 C13Three and Tower、 C14 A tower for the summer heat、 C15 Return-to-right hall、 C16 House of gathered refinements、 C17 The cloud-scraper、 C18 Shijin building 、 C19 Homing crane lodge、 C120The Male Heir Tower、 C121 Inativity Room、 C122The Hermit Tower
	2 Self-inscribed plaques	C21 Apprentice with Others、 C22 Principle with the Ancients、 C23 Principle with the Heavens

4.1. Gene category

4.1.1. Courtyard layout

In the garden architecture, the "Twelve Towers" take buildings as the main body. For instance, in the back garden of Ho Ying Low, there are two water pavilions. One faces west and the other faces east[4]. They are the key components of the overall layout, separated by a pool. Although they are within the same mansion, due to the division by walls, especially in summer when the weather is hot, the two water pavilions can simultaneously offer a cool environment above the summer heat. Moreover, through the reflection in the water, they seem to have a kind of mutual understanding, and their combination with the pool forms an ingenious layout. The wall in the water symbolizes the barrier between the Taoist gentleman and the scholar. Li Yu skillfully utilized the layout of the mansion and

its architectural features to create a garden scenery where "the green shade lasts long in summer, and the reflection of the building falls into the pond".

The "Tower for the Summer Heat" is a high-rise building that is very open. It is surrounded by water on three sides, and lotus leaves are planted in the water. Covered by green acacia and willow trees, from early morning to dusk, not a single trace of sunlight can be seen inside[4]. Although there are shelters nearby, from a distance, there seems to be no obstruction. The layout of the "Tower for the Summer Heat" features a high-rise building encircled by water on three sides, with the water serving as a natural barrier. When people are close by, their line of sight is blocked by the water, and only from a distance can they perceive the scene inside the building. The use of Western telescopes to observe the building surrounded by water on three sides has become a symbol of the new concept of free marriage, breaking the old feudal concept of "the order of parents and the words of matchmakers" which was inviolable in ancient times. Meanwhile, the special pattern of the building presents a unique view with lotus flowers on three sides. Additionally, it takes advantage of the high specific heat capacity of water to stabilize the surrounding temperature. In summer, it can absorb heat to lower the temperature and enhance the living comfort, which echoes with the name of the building "Xiayi". It serves as an excellent example of how the layout of ancient garden buildings could improve the living environment.

The 'Wei House' is situated in the rear garden. One of its notable architectural features is the so-called 'cloud-scraper', a structure that attracts the attention of architectural theorists due to its unique and somewhat precarious nature[4]. Externally, the building has a terrace which was originally designed for sunbathing. This terrace is enclosed by hedges on all sides, making the interior of the building invisible from the outside and vice versa. The fence around the terrace is particularly worthy of attention. Its one-way perspective pattern symbolizes the social reality in ancient times when men in power oppressed women and hindered them from independently changing their destinies. The layout of the courtyard in the Wei residence exhibits a duality between public and private architectural spaces. It encompasses outwardly open public spaces, semi-private social areas, and private personal spaces. From the perspective of publicity, the terrace of the 'cloud-scraper' serves as a visual channel, facilitating information exchange by virtue of its outward-facing design. Meanwhile, the semi-private space within the 'cloud-scraper' has the potential to transform into a social space, thus promoting communication and interaction among individuals both inside and outside the building, which is reminiscent of public social venues in ancient times. The 'Wei House' incorporates a unique unidirectional perspective design, providing spatial concealment and visual protection for private activities within the building. In general, the architectural layout of the 'cloud-scraper' represents a distinctive combination of public and private spaces, embodying the public-private grading of space that was characteristic of ancient garden architectural layouts.

4.1.2. Building type

In the book "Twelve Towers", buildings are dominant with water pavilions and garden pavilions as supplementary building types, and the garden buildings are mainly presented functionally. It introduces edifices like "A tower for the summer heat", "The cloud-scraper building", "The Shijin building", "The fm radio building", "The Homing crane lodge" etc. (with the repeated mention of "The fm radio building" perhaps needing verification). [4]"A tower for the summer heat" is the primary compound structure, offering accommodation for residents in terms of living space and enabling an overview of the whole garden including blooming lotus in the pond from its upper floor in terms of the viewing area. The "fm radio building" in an open space has a bright upper floor window for looking into the distance and seeing the "Shijin building". The "Shijin building" acts as a visual focal point and creates a mood for looking afar, and being above a pond in Ho Ying Low, it's classified as a water pavilion. In the "Return-to-right hall", one of the two garden pavilions was converted into a nunnery for worship and spiritual cultivation and the other into a three-story residence for shelter and protection. The building in "Wenjiaolou" has a thatched roof described as "several rafters of

thatched roof, the most simple appearance but the inner reality is exquisite work"[4], which reflects intricate craftsmanship and Taishi's emphasis on simplicity as well as commitment to his friend.

4.1.3. Storey of building

In the context of ancient architecture, the number of floors in a building is imbued with profound symbolic significance, often reflecting cultural traditions and beliefs. For instance, within the framework of the "nine to five" concept, the number nine is regarded as the ultimate and noble, and structures with nine floors are frequently observed in royal edifices. Conversely, the constraints imposed by building techniques and materials also exerted a discernible influence on the number of floors. In antiquity, the absence of modern technological and material advancements rendered the construction of high-rise buildings a more arduous task. Furthermore, the concept of feng shui might have exerted a significant influence, as specific numbers of floors were deemed to be more congruent with feng shui principles, believed to engender favourable outcomes. For instance, palaces and temples were often constructed to be lofty and resplendent, with a comparatively greater number of floors, thereby signifying their status as hallowed grounds. The book "The Twelve Towers" provides a detailed description of the number of floors of the building, including the Three and Tower, which has three floors, each with a specific function and embodying Yu Suchen's personal elegance. The lower floor serves as a reception area, the middle floor is dedicated to reading, and the upper floor is a space to avoid vulgarity. It is important to note that the primary focus of "The Twelve Towers" is on the main residence, and consequently, other structures are not included in the discussion of the floors, with the majority of them being ground floor buildings.

4.1.4. Decorative Artifacts

In the context of ancient garden architecture, decorative artefacts constitute a pivotal element, endowing the garden with a distinctive charm. Primarily, carvings play a pivotal role. Whether on wooden doors, windows, railings, or stone pedestals and monuments, there are exquisite carvings to be found. The thematic content of these carvings encompasses vivid figurative representations, auspicious animal motifs, and floral and plant elements. These motifs not only serve to showcase the craftsmanship of ancient artisans but also serve to convey specific architectural intentions. Examples include the carved railings and curved thresholds in the Three and Tower, and the carved railings and curved pavilions in the A tower for the summer heat. The term "carved railings" denotes the carved embellishments adorning the railing, "curved threshold" signifies the railing's sinuous, curved shape, and "carved railings curved sala" alludes to the carved decoration along the railing encircling the sala building. The architectural form of the sala building is frequently characterised by zigzagging and changing, thereby combining the dynamic water with the static architecture. This reflects both the craftsmen's skills and the architectural intention through the carving of the water. Secondly, the presence of various exquisite ornaments is worthy of note. Examples of these include charming ceramic vases and exquisite copper incense burners, which serve to emphasise the delicate and elegant garden architecture in every detail. The quality of the decorative artefacts simultaneously represents the host family's aesthetic tastes and social status. The Three and Tower, for instance, exemplifies this. The lower layer features a carving rail, a curved threshold, and a bamboo seat with a flower creeper, alluding to the role of the host in welcoming guests. The middle layer is furnished with a net, several vibrant windows, toothpicks, and jade axes, suggesting the space dedicated to reading correspondence. The upper layer remains largely unadorned, save for an incense burner and a volume of Huang Ting, signifying an uncluttered environment conducive to introspection[4]. The decorative objects on these three levels are selected according to their function within each space. The lower level, designated for receiving guests, features decorations that exude elegance and sophistication, underscoring the importance of these visitors. The middle floor, intended for reading and intellectual pursuits, is characterised by a minimalist and luminous ambiance, with a curated selection of books representing the owner's personal interests. The uppermost floor, designated for recreation, features a single incense burner and a volume of 'Huang Ting', serving to underscore the owner's refined character and the act of being enraptured in the garden pavilion.

4.2. Essential Gene

Garden architecture is not an isolated element within a garden; rather, it is interdependent with other components of the genetic combination and harmonious coexistence with the garden. The layout, style and colour of garden architecture, in conjunction with other elements of the overall style of coordination, collectively convey a specific emotion and mood. Concurrently, garden architecture can direct the viewer's experience of the landscape. Through the strategic positioning and orientation of the building, it guides the viewer's gaze, facilitating a more profound appreciation of the garden's other elements. According to the description of elemental genes in Twelve Towers, the garden is divided into three categories of genetic features: a water system, plants, and vignettes.

4.2.1. Water system

Water constitutes a pivotal component of classical Chinese gardens, assuming a dual role in both the division of space and the creation of an ambience, whilst simultaneously serving as an independent landscape element. In Ho Ying Low, the pool between the two courtyards assumes a pivotal role in the narrative. The presence of the pool not only serves the practical function of demarcating the courtyard, but also fosters an atmosphere of auditory interaction across the water, despite the absence of visual contact. The water thus becomes an invisible link, connecting the two separate families and contributing to the reconciliation of the two courtyards. This reflects the dual role of the water system in the garden, which can both divide the space and integrate a variety of elements. A tower for the summer heat in the lotus pond adds a different style, creating a hot summer green trees, lotus blooming comfortable environment. In the subsequent chapters, the water system is not described in great detail, but rather serves to establish a particular mood and promote the narrative.

4.2.2. Plants

Plants represent a pivotal component of classical Chinese gardens, contributing significantly to the aesthetic appeal of these spaces. The utilisation of diverse plant species, characterised by vibrant hues, unique textures, and varied forms, results in the creation of exquisite natural landscapes. These elements play a pivotal role in the overall composition of the gardens. The symbolic significance attributed to various plant species in ancient Chinese culture is noteworthy. The plum, orchid, bamboo, and chrysanthemum are particularly notable examples. These plants embody the refined taste and extraordinary spiritual inclinations of their cultivators. The 'flower columns like mulberry and hemp' [4] are an embodiment of Yu Suchen's life. His passion for constructing garden pavilions is intertwined with his affinity for flowers and bamboo, which serve as the primary botanical elements of his residence. The tower, designed to offer respite from the summer heat, featured lotus leaves planted in water, with green acacia covering the structure and willow trees providing shade. This arrangement ensured that sunlight reached the tower from early morning to dusk. The focus on aquatic plants in the design is noteworthy [4]. Li Yu expressed a preference for lotus flowers and authored an essay titled 'Infinite Flowers', in which he described them as 'the fruit of five grains without its name, and the length of a hundred flowers and each go to its shortness, and the benefits of planting are greater than this?' [5] It can be observed that the plant is not only beneficial to the environment, but also to human well-being. Li Yu's esteem for infinite flowers is evident, while green acacia and weeping willow serve as shade-providing plants to mitigate summer heat.

4.2.3. Plaque Gene

The term "garden vignette" refers to the incorporation of small, novel elements into a garden to enhance its aesthetic appeal and contribute to its sense of place. These elements, which may include small sculptures, plants, or other decorative features, are integral components of the garden environment. [6] It is not located in a pivotal position within the garden, as is the main building, but rather serves to embellish the garden landscape, thereby enhancing its expressiveness. The text on the vignette is not frequently cited; its purpose is to support the building's functionality. For instance, the stone columns and flying bridge in Ho Ying Low serve as auxiliary structures to the primary building

of the water pavilion. The flying bridge is composed of two sections, which are connected to the channel by stone columns, forming the structural foundation of the flying bridge.

4.3. Essential Gene

4.3.1. Plaques of Buiding Names

The plaques in Twelve Towers serve two functions: firstly, they function as the names of the buildings themselves; secondly, they function as the titles of each article. These plaques offer a concise articulation of the themes explored in each article, providing a high-level summary of the article's central argument. The plaques, including Ho Ying Low, Jin Jie Lou, and Wen Jie Lou, offer a concise introduction to the primary plot of the story. The categorisation of these plaques within Twelve Towers is divided into three primary classifications. The first category is associated with feelings and destiny, as evidenced by the plaque 'Ho Ying Low', which symbolises the intertwining and association of the destinies of the characters in the building and expresses the intention of reunion. The second category is associated with destiny. The origin of the 'Shijin building' plaque, for instance, reflects Yao Jian's ill-fated marriage. The transition from the original 'Shijin building' to the final 'Fm radio building' mirrors the nine failed marriages experienced by Yao Jian within a three-year period. This plaque serves as a figurative manifestation, representing the tumultuous journey of his matrimonial life and underscoring the notion that his marriages were not as fulfilling as he had hoped. The third category is related to the change of Return-Turn, from 'Return-to-Rest Hall' to 'Return-to-Right Hall'. The change of the plaque symbolises the transformation of the protagonist's life. Initially portrayed as a skilled swindler, the protagonist's life undergoes a profound transformation, influenced by various factors, leading him to adopt a more ethical and righteous path. The term 'Return to Righteousness' vividly encapsulates the transformation from malevolence to benevolence, and the edifice thus becomes the symbolic locale of this metamorphosis. The thematic significance of these building name plaques, which serve as both a pointer to the subject matter of each story and an embodiment of Li Yu's distinctive moral vision, provides readers with significant interpretative clues to comprehend the central themes and ideas of the narrative.

4.3.2. Plaques of Buiding Names

The presence of self-inscribed plaques is exclusively observed within the Three and Tower. In the edifice, each stratum of plaques bears inscriptions that delineate the roles of the individuals depicted. The uppermost stratum, representing the master of the place to receive guests, is inscribed with the name "Yu Suchen". The middle stratum, inscribed with the name "ancient as a disciple", signifies the mastery of the study of knowledge and the study of antiquity left by the preceding era. The uppermost layer, representing the sky as a disciple, unveils the master of the garden pavilion's construction preferences, a pursuit distinct from the noble. These three plaques are intended to reflect the Yu Suchen's noble and elegant dedication to the garden's individual pursuit.

5. REDUCTION DESIGN OF HO YING LOW IN TWELVE TOWERS

5.1. Historical context in which the building is located

The location depicted in the novel Ho Ying Low is Qujiang County, Shaoguan Prefecture, Guangdong Province, during the Yuan Dynasty's Zhizheng Years, The Yuan Dynasty's Zhizheng Years was was the year of Yuan Huizong Marco Polo Toledo Tzetsu, which lasted for 28 years (28 years) from 1341 to 1346. Qujiang County, Shaoguan Prefecture, Guangdong Province is the Qujiang District of Shaoguan City, Guangdong Province. Qujiang to the territory of the 'river flow back to the curve, because of the name', geographically located in the south of the Lingnan region of China, the main terrain to the mountains and hills.

5.2. Courtyard layout

The layout of Lingnan courtyards is generally divided into the layout of the building around the courtyard, the layout of the front courtyard, the layout of the side courtyard of the study, and the layout of the back courtyard of the front house. [7] The original text of Ho Ying Low describes the layout of the building as ‘a house is divided into two courtyards, where the boundaries are built high walls’, ‘only in the back garden there are two water pavilions’. [4] So the layout of the courtyard in Ho Ying Low should be the layout of the front courtyard and the back courtyard, and the layout is usually the traditional courtyard house in front, and the garden is in the back or beside the house. Most of the residence-based houses adopt the central axis symmetry, and large houses can have multiple axes. After the strict symmetry of the courtyard, small gardens were laid out at the back or side of the residence. In the text, Guan and Tu held the official positions of Tizhu and Observation. In the Yuan Dynasty, these two official positions were ‘from the fifth rank’, so it is assumed that the courtyard in Ho Ying Low should be a binary system with a backyard. The backyard was a courtyard consisting of a water pavilion and a pond. Since Guan and Tu did not get along with each other, high walls were built to separate the boundaries of the courtyard. Since most of the residential houses at that time had a symmetrical structure with a central axis, it is assumed that the walls were built to divide the courtyard based on the central axis of the courtyard. Based on the above speculation, the layout of the Ho Ying Low compound was drawn (Figure 1).



Figure 1. Layout of the Ho Ying Low Courtyard

5.3. Restoration of the ‘Ho Ying’ scene in the water pavilion

The original text of Ho Ying Low states that the edifice is a water pavilion, ‘there are two water pavilions in the back garden, one facing west and one facing east’ [4]. It is assumed that the two water pavilions are in a pattern opposite each other, and that Jinsheng and Yujuan meet each other through the reflection in the water. It is also evident that the water pavilion is situated on top of the pond. The easternmost structure is the Tijiu income, and thus the eastern face of the water pavilion is visible in the Yuju, while the western face of the water pavilion is visible in the Jinsheng. The water pavilion was divided by a wall, thus preventing full visibility, which suggests that it was a one-story structure. While there is no extant description of the decorative elements in Ho Ying Low, it is generally assumed that A Tower for the summer heat, which is also in a watery environment, also has a ‘carved fence and curved pavilion’. The hypothesis that the water pavilion to the land connecting the bridge is also the form of zigzag is substantiated by the observation that the Ho Ying Low in the form of the bridge is also the form of zigzag. This form is consistent with the aesthetic principles of the Yuan Dynasty Lingnan garden art style. The aesthetic appeal of the zigzag form is evident when observed from diverse perspectives, and its capacity to adapt to the surrounding environment is noteworthy. The zigzag path symbolises the tumultuous love of Zhensheng and Yujuan, and the water pavilion at the end represents the ultimate happy ending of their love. The precise plant configuration of the pool remains unillustrated in the original text; however, through the analysis of the plant species present

in the A tower during the summer months, in relation to the water feature, it can be deduced that the vegetation may have comprised acacia trees and lotus flowers. The vignettes in Ho Ying Low are primarily stone pillars and walls, and it is hypothesised that water features are often paired with rockeries in the landscaping of Lingnan courtyards. Consequently, as evidenced by the textual descriptions and gene mapping results, the three types of genetic information can be supplemented, thereby facilitating a more comprehensive restoration of the water pavilion 'Heping' scene (Figure. 2).



Figure 2. Restoration of the ‘Ho Ying’ scene in the water pavilion

6. SUMMARY

In this study, the gene map of garden architecture in Twelve Towers was produced by screening and extracting the text in Ho Ying Low related to garden architecture, and the scene of Ho Ying Low was restored accordingly. The utilisation of literary works for the study of garden architecture has been demonstrated to facilitate comprehension of gardens that are otherwise challenging to document in a realistic manner. The construction of gene maps enables the formulation of hypotheses and the completion of features that are absent from the documentation, thereby transcending the limitations imposed by fragmented and indistinct perceptions. This enhances the precision of the recovery of ancient garden architecture and facilitates analysis from a more comprehensive perspective. In summary, the construction of gene mapping for the recovery study of garden architecture in literature provides a new idea for exploring ancient garden architecture, which is of great significance for the inheritance and protection of ancient Chinese garden architecture.

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