

Scientific Research on Plant Configuration in New Chinese Gardens

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Abstract: Based on the study and understanding of classical gardens, the design structure framework is constructed, and the factors affecting the characteristics of classical gardens are refined by using the AHP scientific method. Taking plant configuration as the starting point, the purpose is to better build a new Chinese style garden that not only reflects the classical garden style but also meets the aesthetic needs of modern people's life, and also provides reference materials for further research on the new Chinese style garden landscape.

At present, European style and exotic style garden landscapes emerge in endlessly, and are full of domestic landscape construction. However, people are gradually awakening and no longer blindly imitate and pursue the same international form [1]. In order to highlight the cultural characteristics of the country and the region, the concept of "new Chinese style" emerged at the right time. From the early Vanke Fifth Park in Shenzhen to the later rise of Tianjin's style bamboo landscape, Shanghai's Jiujiatang, the courtyard on the Beijing Canal, and other representative new Chinese residential areas have emerged in endlessly, which has well led to the development of the new Chinese style landscape. On the premise of meeting the requirements of modern aesthetics and life, the new Chinese garden landscape aims to inherit and carry forward the gardening techniques and ideas of Chinese classical gardens, so as to better integrate them into modern people's life, and become a new trend accepted and respected by Chinese people and even the world.

1. The concept of new Chinese garden

The new Chinese style garden is based on the people-oriented principle. On the basis of refining the elements of Chinese classical gardening, the components and elements of classical gardens are regenerated. This is not only the stacking of elements of Chinese classical culture, but also the modern Chinese garden landscape that should be integrated into the understanding of modern people on classical culture, and then cast by using modern technology and meeting the aesthetic needs of modern people.

2. Research methods

2.1 Literature collection method

After determining the objective and purpose of the investigation, the author consulted and sorted out the relevant literature and books on the theme of New Chinese Gardens, Chinese Classical Gardens, and Plant Configuration, which had achieved certain results, and finally summarized them. On the basis of providing sufficient theoretical basis for the thesis, it is more helpful to sort out the research ideas. From the perspective of garden construction, the 22 factors affecting Chinese characteristics, including plant configuration, are sorted out and the corresponding hierarchy is established.

2.2 Expert investigation method

Two surveys were conducted on the relevant contents of this thesis to professors and graduate students in the field of landscape architecture design. In the first survey, the 20 characteristic factors in the structure system of Chinese characteristic indicators that have been initially refined will be consulted by experts, and adjusted after sorting out the questionnaire to form a more reasonable and

authoritative infrastructure system; The second is to compare the indicators in the two levels of indicators after adjustment to determine the relative importance of indicators at each level and quantify them in figures. The weight value of each index can be calculated after data analysis.

3. Research content

3.1 Establish the hierarchical structure of the new Chinese style garden

On the basis of a large number of literature collection and book review, 22 factors affecting the construction of new Chinese style gardens, including plant configuration, were preliminary determined. Then, expert questionnaires were used to discuss with professors and graduate students of landscape architecture. Finally, after adjustment, 19 basic factors affecting the characteristics of the new Chinese style were extracted, and their hierarchical structure was sorted out to form a basic indicator system with the new Chinese style characteristics as the research objective and 19 basic factors refined by experts. There are 6 first-level indicators, including design methods, plants, buildings, sketches, water bodies and stone placement.

3.2 Form judgment matrix

The construction of the characteristics of the new Chinese style garden has a certain degree of professionalism. In order to ensure the scientific nature of the results, the expert survey method is still selected when conducting a comparative survey. A questionnaire survey was conducted among 22 professionals who are engaged in landscape architecture and graduate students, and the relative importance of each factor was obtained by comparing each factor in pairs.

Table 1 1-7 Scale

Scalar value	Describe
1	equal importance
3	weak importance
5	strong importance
7	absolute importance
2, 4, 6	The intermediate level of the above adjacent judgment shall be adopted when compromise is needed The reciprocal of pairwise comparison indicates the opposite

In the process of comparison, in order to convert the text description into digital comparison, the comparison results are quantized according to the 4-level 7-level method (see Table 1 for the specific method of 1-7 scale), and the quantized double comparison matrix is obtained.

This time, 22 experts were consulted. Because the AHP analysis was carried out in groups, a pair of comparison values was the geometric average of each decision value in the group [4].

Matrix A(design methods, plants, buildings, sketches, water bodies and stone placement)

1	0.477	3.2	5.863	5.2	5.090
2.2	1	3.864	4.2	4.773	5.182
0.379	0.284	1	5.227	5.8	6.136
0.189	0.227	0.182	1	0.432	0.545
0.172	0.236	0.189	2.2	1	1.955
0.209	0.172	0.152	0.477	0.545	1

Matrix B(Plant species, plant planting methods, plant aesthetic characteristics)

1	0.636	0.568
1.864	1	1.591
1.773	0.682	1

4. Plant configuration of new Chinese garden

The status of plant allocation in the new Chinese style garden is superior, not only because of the calculation results of AHP method. At the beginning of gardening, Chinese classical gardens adhered to the design idea of "learning from nature and integrating nature and man", and strive to create "urban mountains and forests" with "a very close place" to achieve the artistic effect of "being created by man" and "opening from heaven". This reflects the importance of nature in classical gardens everywhere, and the new Chinese style garden should inherit this essence. Among the elements of gardening, the plants themselves reflect the natural beauty.

4.1 Plant species

In the selection of plants in the classical gardens, the selection of trees suitable for the site is full, because the selection of tree species is relatively monotonous. According to the survey, six gardens in Suzhou include Humble Administrator's Garden, Lingering Garden, Wangshi Garden, Lion Forest, Huanxiu Mountain Villa, Canglang Pavilion, among which more than 10 kinds of plants, such as osmanthus fragrans, Podocarpus arvensis and Magnolia magnolia, are replanted at a rate of 100%; The replanting rate of more than 70 plants is 50%. From the six scenic spots in the Humble Administrator's Garden, it is found that not only the repetition rate of tree species selection is high, but also the diversity of tree and shrub configuration is very simple. There are 19 kinds of Fucui Pavilion, 13 kinds of loquat Garden, 4 kinds of Songfengshui Pavilion, 3 kinds of Magnolia Hall, 3 kinds of Begonia Spring Dock, and 3 kinds of Datura 18 Flower Hall [5].

With the development of modern transportation and science and technology, the survival rate of many non-native trees is getting higher and higher, and their appreciation value is also increasing. People have more and more requirements for the diversity of ornamental plants in gardens. There are more than 300 kinds of ornamental plants in more developed areas in China, such as Guangzhou, followed by more than 200 species in Hangzhou and Shanghai, and more than 100 species in Beijing [6]. It can be seen that the diversity of plant species will be an irresistible trend, and the emergence of the new Chinese garden is to find an outlet for the classical garden can not meet the aesthetic needs of modern people's life, so the plant configuration of the new Chinese garden, in addition to selecting plants with strong Chinese flavor and local characteristics, should also meet the development needs of modern people, and pay more attention to the diversity and diversity of plant configuration.

4.2 Planting mode of plants

With the evolution of history, the way of plant planting has gone through the initial stage, the initial stage, the development stage, the maturity stage, the integration stage, and the inheritance and development stage. Its function has changed from production as the main role to ecological science as the basis, viewing as the main role, and using artistic means to pursue the commonality of visual beauty and cultural connotation, It is summarized and refined to form the following six types of planting methods [7].

4.2.1 Solitary planting

From the visual point of view, the trees planted are more eye-catching, so they are generally tall trees with beautiful shape and appropriate configuration. The posture of the arbor and branch and the outer contour of the crown are not controlled manually, but can be reasonably selected according to the characteristics of the tree species. In "Yuanye", "the yard is wide and magnificent, and the bay is suitable for willows" contains the meaning of selecting suitable tree species according to local conditions. Smaller courtyard space should be planted alone. The tree species may be valuable, tall, vigorous, ancient, graceful, or intertwined. In short, they should have a unique character. For example, at the entrance of the Liuyuan Garden, the ancient wooden Jiaoke courtyard is very small, and there is an old locust tree occasionally in the southeast, which is dry and vigorous and clumsy, thus becoming the theme of the landscape, "ancient wooden Jiaoke" and hence its name. Similarly, there is the Cocoa Court in the North Sea Boat House.

4.2.2 Conglomeration

Three or more trees of the same kind or several trees are planted together as clumps. Do not line up in a straight line or form an equilateral triangle or quadrilateral.

One kind of plant is planted in clusters, which requires different postures and mutual convergence; There are many combinations of several plants, such as evergreen trees and deciduous trees, flowering trees and foliage trees, conifers and broad-leaved trees, trees and shrubs, which have a wide range of choices and flexible artistic effects. The trees used for cluster planting do not have high requirements for tree shape, but the advantage is that they are more attractive to each other.

4.2.3 Arrangement

Row planting refers to the planting of trees and shrubs in rows according to a certain spacing. Its landscape is ambitious, simple and magnificent. The trees planted in rows often play a role in guiding realization, shading, background or tree screen, setting off the atmosphere, etc. If there is an ornamental node in front of it, planting trees can also play a role of landscape clipping.

4.2.4 Group planting

Take one or two kinds of trees as the main body, and match them with tree species, trees and shrubs to form a large area of tree group, and become group planting or tree planting. In terms of function, it can prevent the strong wind from blowing, provide visitors with cool and shade in summer, and cover the less beautiful part of the courtyard; The trees planted in groups can form a dark contrast, and the vertical landscape formed by them is more abundant. There will be more changes in the skyline contour, which can also increase the wild interest in the garden.

4.2.5 Spot planting

Although the planting position is relatively independent, the artistic conception expressed is the same. This planting method is point planting. Spot planting can be divided into two types: one is the same kind of spot planting, which can express the artistic conception in the same season. For example, in the Situ Temple of Dengwei Mountain in Suzhou, four ancient cypresses are planted to create the interesting meaning of "Qing", "strange", "ancient" and "strange"; The second is the planting of different species, which creates an artistic conception at different seasons, such as the "Four Seasons View" of Suzhou Resort, which uses wisteria, white pine, crape myrtle and green maple to represent the changing scenery of spring, summer, autumn and winter.

4.3 Aesthetic characteristics of plants

4.3.1 Beautiful color

We can realize that in ancient gardening, we paid special attention to the matching of plant colors in the plant configuration. There are many colors of plants. The common red ones are begonia, peony, pomegranate, camellia, brocade, acacia, crape myrtle, phoenix, elm, etc; There are winter jasmine, forsythia, osmanthus, golden bell, golden tea, yellow chan, wintersweet, hypericum, etc; There are wisteria, rhododendron, lilac, magnolia, hibiscus, hydrangea, drunken grass, etc. in blue; There are white mountain flowers, privet, viburnum, magnolia, pearly plum, gardenia, magnolia, etc. The beauty of color has its own merits. In order to express different artistic conception, different planting techniques should be used.

4.3.2 Form beauty

In order to meet modern aesthetic needs, with the progress of technology, the beauty of plants can also be varied. The cylindrical tree crown gives people a sense of majesty, solemnity and stability, and the spire shape also has a sense of solemnity; Spherical, pendulous and inverted oval shapes give people an elegant, soft and vivid feeling; The palm shape can often reflect the southern wind, while giving people a sense of straightness and beauty; The carved shapes formed by artificial pruning and coiling of trees can imitate the shapes of human beings, animals, buildings and other

objects, improve the taste of viewing, and increase the appreciation of the characteristics of the carved objects.

5. Summary

As a result of blindly imitating and copying, the problem of forming one side of a thousand cities is a serious challenge to the development of domestic landscape architecture. It is an inevitable choice to develop the landscape architecture with its own unique history, culture and style. The new Chinese style garden, which came into being at the historic moment, combines the design principles of classical gardens with the life and aesthetic needs pursued by modern people. It seeks a better outlet for the integration of classical gardens into modern life.

Through scientific research methods, this paper provides some reference for the construction of the new Chinese style garden landscape, and provides a basis for its further research in the landscape configuration. It is hoped that through joint efforts and practice, the new Chinese style garden that integrates the beauty of classical gardens with the life and aesthetic requirements of modern people will be realized.

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