THE AIR COURTYARD OF HIGH RESIDENCE: THE INHERITANCE AND DEVELOPMENT OF CHINA'S TRADITIONAL COURTYARD SPACE

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ABSTRACT

According to the features of China's traditional courtyard, and combining with the practice of modern courtyard, this paper proposes the concept of air courtyard, and analyzes and recapitulates the four forms of high residence's air courtyard in modern city's residential area. In addition, the paper outspreads the exploratory thinking about the creative design of air courtyard. It is the inheritance and continuation of China's traditional courtyard, as well as the new birth of residential courtyard in modern city.

Key words: High Residence, Courtyard, Air Courtyard.

Introduction

Courtyard is China's traditional space form. To Chinese, courtyard housing is the ideal housing in China's thousands of years' history, which is also the core of China's traditional residential culture. Courtyard, as the space that holds rain and dew, absorbs lunisolar quintessence, has the function of catchment and aeration. So far of the
human's civilization, the population expands rapidly, which brings lots of social and environmental problems. China, as the nation with the largest population, faces an austere situation of “more people but less filed”, the traditional residential morphology of courtyard with low density can not meet the requirement of modern city housing with high density. So, the courtyard housing has becoming the cherished memories to most people. Can city's courtyard housing exist and continue under cultural and spatial environment, and how? This is the starting point of this paper, and the aim is to continue the space form of “China's traditional courtyard”, so as to create a courtyard space that is suitable to the high residence.

The Conception of “Air Courtyard”

Air Courtyard is a courtyard which is formed by shape change, angle and air connection. It is the representational form of "the modern inheritance of traditional courtyard" in modern China's residential area in recent years. To the middle-high building, the vertical courtyard model proposed by “Air Courtyard” is the application of the solution to contradiction between high density and soil erosion, intercourse space's absence.

The Origin and Development of “Air Courtyard”

“Layers of high stages, soft water, exuberant trees, sweet voice of birds, and flagrant flowers” it is Old Babylon's Hanging Garden that is mysterious and spectacular that attract us. At the beginning of modern architecture, Corbusier, the great modernism architect, proposed “five points of new architecture”, in which definitively set the roof garden as the characteristic of modern architecture. A roof garden which has a surface of 1.2hm² has been built in the roof of Kieser Center, Oakland, California, U.S, and it is considered to be the true roof garden that can compare with Old Babylon's Hanging Garden. The famous architect, Corea exhumed a new open-to-sky-Space theory from India's traditional architecture, and this theory was incarnated in his masterpiece—the design of Kanchenjunga Apartment in Bombay. In compliance with the India's local climate feature of warm humid climate, Corea proposed a new concept of "middle zone", that is to create a zone with protective effect between indoor and outdoor, so as to achieve the effect of sheltering afternoon's sunshine, stopping monsoon's impact, and the regulation of micro-climate. It mainly consists of two layers of garden platform that form the air courtyard space.

From the harmonious process between human and nature, we can see the ancient people as well as the modern people can not satisfy with the personal home decoration, but emphasize the landscape and environment outside room. For the moment, China is placed in a high speed stage of urbanization, the uptrend of level
postpones was gradually broken by perpendicular high buildings. As the gathering and enlarging population in China, the habitation in all urban area has been the problem needs prompt solution. Residence in urban courtyards which once brought lots of good memories in life has been a luxury for it occupies the urban space resources when brings funny to life. Facing with this situation, can we keep the survival of courtyard in the premise to maintain density, make urban courtyard residence as a possible mode of living, let China's traditional courtyard residence come back to city life when acquire humanistic value and use value?

The styles of “Air Courtyard”

Air Courtyard is not equal to air garden. The so-called “Air Courtyard ” which mainly emphasize the greening and plant on roof, so as to improve city's environmental beauty, enlarge the stereo space, provide the site for leisure, tourism, entertainment. However, "Air Courtyard " prefer emphasizing the functionality such as improving the heat insulating property and enlarging the greening area to setting it as communication space between neighbors, as well as between human and nature. Due to the people separately live in high buildings, there's a lack of centralized communication site, they seldom go downstairs to enjoy the space between buildings, so the relations between neighbors is disharmonious. Air Courtyard is to create a platform for communication, private space or semi-private space, surrounding or semi-surrounding, vertical developed stereo courtyard in multistory and tall residence.

“Roof Garden” Style

It is the traditional meaning of "Air Courtyard", which mainly means to implement layout on building's roof or on the structure that covers the roof, to make the households of the multistory and tall residence get access to nature outside their house.

“Entering Household Garden” Style

That is, to assert a spot of field for gardening in front of the entrance to inside house.

“Concave Balcony” Style

Combine with the concept of "courtyard", that is to set hanging garden as the core to organize the layout of functional space inside room, break the space isolation between functional houses. And this form semi-open, indoor and outdoors’ blend and various space shapes. Meanwhile, this style ensures good natural lighting and landscape effect of each room.
“Public Garden” Style

This is the public form of "Air Courtyard ", which set a public garden with a height of one or two layers between every two layers in public traffic space. Decorating with environmental greening, laying stone bench and greening, diluting traffic form, enhancing the chances for communication, making people feel greening every where in their most frequent daily activities' space, this style of " Air Courtyard " is more suitable for small house type in high-rise residential apartments and single apartments.

**Design Exploration of “Air Courtyard”**

The two conceptual designs of air courtyard are illustrated as follows:

**The First Conceptual Design**

Design different house types in vertical direction. Each two houses are connected, so as to form a higher air courtyard by the use of space. To stack different house types in vertical direction, if small house has only one floor, the bottom of large house can recess when it has two or three floors, to create small house's courtyard space of two floor's height. At the same time, big houses itself can also form courtyard space of the same height, or form a high space courtyard by dint of another house. For this kind of housing design, it owns the flexibility and variety, and also enriches facade effect. The form of "Air Courtyard" by using different house types in vertical direction is illustrated as Figure 1.

![Figure 1](image-url) The first conceptual design
The Second Conceptual Design

In order to access nature conveniently, the middle part of high residential building can be emptied to form a public "Air Courtyard" through design. If the emptied part be designed as a step-like drop, it will turn public garden into private, and will form a constant greening from up to down (Figure 2).

![Figure 2 The second conceptual design](image)

The Important Significances of “Air Courtyard”

Create a centralized communication space between human and nature for each household in every building—“Air Courtyard”, this will bring a great improvement for residence’s leisure life and the communication environment between neighbors.

First, “Air Courtyard” improves urban citizen's leisure life space situation inside and outside room. It adds a new spatial level between personal housing inner space and housing courtyard space. Compared with outside communication space, its space properties have weaker publicity but stronger privacy. And this forms a spatial gradient of “interior space of residence—“Air Courtyard”— residence courtyard space—urban leisure space”.

Second, it is good for creating a living atmosphere of “Human Being Syncretizing Nature”. “Air Courtyard” satisfies people's desire of safety and avoiding secularity. Simultaneity, it adopts measure of open-type in the dealing with the line of sight, brings nature into courtyard and make it available to appreciate and know nature in hall or bedroom. Courtyard space has been the important component in modern architecture's outer space, and has been a pure land for people to access and enjoy
Third, “Air Courtyard” has an ecological effect. Combining with the design of dwelling unit type, “Air Courtyard” can deal with various kinds of climate features in housing courtyard space through resuming traditional houses' layout of courtyard house, patio, and concave space and so on with traditional dwelling's adaptability to climate.

Besides, “Air Courtyard” decorates garden with plant to build a plant system of multi-level, stereo, so can achieve the effect of micro-climate regulation. It can also improve the ventilation and sunshine condition of houses, and these ecological factors provide the possibility of developing a sustainable “Air Courtyard”.

With the formation of harmonious relations between neighbors, people's friend space expand as the modern sense of " Big Family ", and the inhabitant can form a sense of belonging easily. As a space of the link between indoor and outdoor, air courtyard inherits the blending between human and nature.

Conclusion

In 21st century, China's urban residential model with high density will continue. The traditional courtyard residential form with low density cannot meet the requirement of urban residence with high density. So, the research that how to solve the hard problem of giving maximum play to bring nature into vertical extension's residential area with high density, is a job of great significance no matter at present or in future. It is an issue full of challenge that how to create harmonious environment, inherit and carry forward China's traditional quintessence, develop a air courtyard culture with Chinese characteristics, which also deserves our research.

References