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EXPLORING THE TYPOLOGICAL PROCESS OF RESIDENTIAL UNIT IN LILONG HOUSING IN TIANJIN, CHINA

Abstract: *Lilong housing in Tianjin was derived from the Chinese traditional courtyard housing. From mid-19th century to first half of 20th century, Lilong housing was constructed in large quantities and varied in type. It was the most representative dwelling house in modern cities. Researches on the classification of Lilong housing were mainly based on the graph of an overall layout and a single building. The influence of culture background on the type and the continuity of typological process was neglected. Based on the method of Italian typology, this paper divides the typological process into four continuous phases and analyses the inheritance and development of residential units in a typological process. In conclusion, the residential unit is much easier to combine in the form and include more specialized rooms in function, which reflect the trend of more intensivist and complexity in Lilong house. It is the first time to apply Italian typology to the study of Lilong housing in this paper. Many questions still need to be answered. But it provides a new perspective for the future research on Lilong housing in Tianjin.*

Keywords: *Lilong housing, Tianjin, typological process, residential unit.*

Introduction






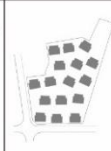

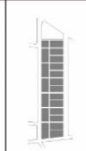
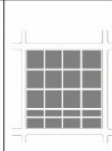

From the mid-19th century, Lilong housing appeared and developed under the background of culture expansion from western countries. Lilong housing was the most important modern dwelling house type in China. It formed a unique urban fabric due to the large amount of construction during a period less than 100 years. Lilong in Shanghai was the earliest in China (Yang, 1983), becoming the main dwelling house type gradually (Non, 2009). Many studies of Lilong Housing are focused on Shanghai.

At the same time, there were also a great number of Lilong housing built in Tianjin, which took up more than half of the total number of dwelling houses at one time. It was a typical architectural style, which is thought to be the combination of traditional Chinese courtyard housing and western row houses (Wang and Chen, 1987). Compared to Shanghai, Lilong housing in Tianjin had a different development process due to the different geographical environment, climate, and social background. But the research on Tianjin is still not enough.

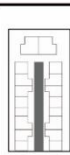






Research on the classification of Lilong housing

Since 1960s, a great many researches have been carried out by the Wang, Yin, Qu, which become the firm foundation of subsequent study. The most basic research was on the classification of Lilong housing mainly in two aspects: an overall layout and a single building. In an overall layout, two main categories were an architecture layout and a lane structure (Wang and Chen, 1987; Shen, 1993). Different classifications were put forward (Figure 1, and b).

In a single building, two classifications were recognized widely. First, according to the historical development, Lilong housing is classified into four types: Old-type Lilong, New-type Lilong, Garden-type Lilong and Apartment-type Lilong (Xu, 1979). Secondly, according to the prototype, Lilong housing is classified into old-type Lilong and new-type Lilong (Yang, 1981).

TYPE \ SCHOLAR										
Wang S. Z. (1987)	●	●			●	●	●			
Shen H. (1993)	●				●					
Luo S. S. (2007)	●		●			●	●			
Sun Z. (2007)	●		●	●		●		●	●	●
Liu M. (2007)	●	●				●	●			
Zang X. Y. (2010)	●					●				

a. Research on classification of architecture layout

TYPE \ SCHOLAR							
Wang S. Z. (1987)	●	●	●	●	●		
Sun Z. (2007)	●		●	●		●	●
Li B. H. (2010)	●		●	●			●

b. Research on classification of lane structure

Figure 1. The classifications on an overall layout

This paper adapts the first classification to a single building and analyzes it further by the typological methods.

Typological method

Typological method is one of the effective methods that can be referred when studying the transformation of buildings. However, this method has not been applied in Lilong housing due to the limitation of language.

Three definitions

There are three important definitions related to this paper in typology: phase, elementary matrix and residential unit.

The first definition is PHASE. In typology, phase refers to a sufficiently long time interval for changes to be clear enough (Canigga, 2001). Each phase has unique feature under its cultural background. Meanwhile, the later phase inherits some character from previous phases more or less.

Lilong housing in Tianjin developed from local traditional courtyard house (Jin, 2002), and has undergone a series of typological phases. From the viewpoint of the function, numerous subsequent development stages can be read in the process between the Lilong housing and traditional courtyard housing. The rooms in the former were highly specialized, while in the latter had less differentiation. In Lilong housing, rooms were of different function: bedrooms, kitchens, living rooms, a corridor, a front yard and a backyard, and so on. These specialized rooms did not always exist in courtyard housing. This paper is focused on the process from traditional courtyard housing to New-type Lilong. As in Old-type Lilong the most representative form is Courtyard-

type Lilong. Four phases will be verified in this paper: traditional courtyard housing, early Courtyard-type Lilong housing, late Courtyard-type Lilong housing and New-type Lilong housing. Since early Courtyard-type Lilong housing showed obvious differences from the late Courtyard-type Lilong housing, this paper divides Courtyard-type Lilong housing into two phases.

The second one is ELEMENTARY MATRIX. In the human structures there is no limit to historical backdating which cannot in turn be derived from former phases; rather an in-between period of a process, by virtue of its being recognized as an indispensable passing moment in the formation of all subsequent types (Canigga, 2001). This is what we regard as an elementary matrix. The elementary matrix contains the logic of the components of the subsequent phases. Therefore, identifying elementary matrix becomes very important.

Till mid-19th century, the traditional courtyard housing has existed stably for a long time, which is indispensable to the formation of Lilong housing. Therefore, we regard the courtyard housing as the elementary matrix of Lilong housing.

The third one is RESIDENTIAL UNIT. We use a residential unit in the interpretation of a building unit (Canigga, 2001). In the dwelling house, we define a residential unit referring to a group of rooms that a family accommodates and can satisfy basic function of daily life. The residential unit is showed differently in four phases. Through the separation of a residential unit, we can distinguish between a basic form and variants.

Two viewpoints

Besides, there are two important points related to this paper: first, the cultural background is closely related to the type (Canigga, 2001); second, the development of the type is considered to be continuous (Canigga, 2001).

Building is the historic (spatial and temporal) individuation of a typological process. Once the type is asserted, the building is defined by the uniqueness of particular time and space that inevitably distinguishes it from others (Canigga, 2001). The building conception has already existed in the brain of the builder before the construction. This conception depends on the cultural background (Canigga, 2001). The cultural background determines what the building is and how it is built, instead of the individual choice of builders. In other words, cultural background determines the type.

Secondly, the type of building undergoes both a diachronic change and a diatopic change. The diachronic change refers to the continuity of the type in the same cultural area (Canigga, 2001). That is to say, the continuity in the typological process is important.

Taking the influence of cultural background on the type into account, this paper is focused on the continuous typological process of New-type Lilong, and regards the traditional courtyard housing as an elementary matrix of subsequent phases. Through separating the residential unit from Lilong housing and the analysis of its developing process, the transformation of Lilong housing can be verified in this paper.

Analysis based on phase

Traditional courtyard housing

Influenced by feudal tradition of China, the form of traditional courtyard housing reflected the patriarchal structure of the family. In Tianjin, the layout of local courtyard housing featured axial symmetry and a clear order (Wang, 1987). Four-sided houses enclosed a central courtyard forming a highly private space (Figure 2, a). Rooms had an obvious grade. One courtyard can accommodate a large family that usually contains several small families in China.

In this phase, the residential unit can be read as a set of connected rooms (Figure 2, b). In a courtyard, there was a principal unit on the axis and a sideward wing unit. The principal unit was inhabited by the elder family, the wing unit was occupied by younger generations and their families. The residential unit included rooms of daily function. The living room was located in the middle, on its both sides were the bedrooms, next were ear rooms used as a study room. The

principal room in the principal unit was sometimes used as an activity area for the whole family (Guo, 2015). Besides, the auxiliary space like a kitchen, a toilet were shared by multiple residential units in a courtyard.

In form, the residential unit in courtyard housing was also seen as the basis of subsequent phases. First, the total width of the residential unit was greater than depth in scale. Secondly, the rooms were arranged horizontally. Just like the layout of the whole courtyard, the unit also emphasized the axial symmetry, insisting the form of bedroom-living room-bedroom. Thirdly, doors were set up only in a living room and ear rooms. Entering into a bedroom must go through a living room. The form of the wing unit is basically the same as the principle unit, but the width and the depth are smaller. Generally, there is only one ear room in wing unit.

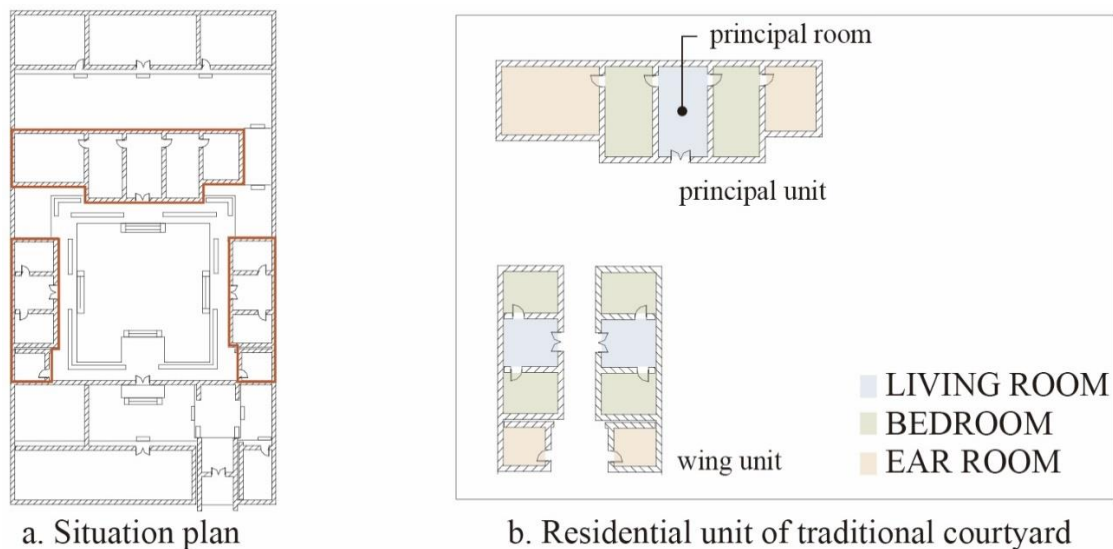


Figure 2. The phase of traditional courtyard housing

Early Courtyard-type Lilong housing

In Tianjin, the urbanization was accelerated in the process of modernization from the mid-19th century. The urban population increased. Capitalism economy promoted the commercialization of dwelling houses. Meanwhile, with the disintegration of the family patriarchal structure (Wang, 1987), the Courtyard-type Lilong housing emerged and developed rapidly from mid-19th century to early 20th century.

The layout of the early Courtyard-type Lilong housing shows rather similarly to traditional courtyard housing (Figure 3, a). The form of axial symmetry and houses enclosing a courtyard were continued (Wang, 1987). On the other hand, two main changes can be seen in this period. The scale was smaller. In addition to a four-sided courtyard, there were also a three-sided style and a two-sided style of Lilong housing (Wang, 1987).

In the residential unit, the early Courtyard-type Lilong housing also inherited a great many characteristics from the traditional courtyard housing (Figure 3, b). The similarity was mainly shown in two aspects. First, early Courtyard-type Lilong housing maintained the form of a horizontal room arrangement and the way of entry through a long side. Secondly, the form of bedroom-living room-bedroom was basically preserved. On the other hand, due to the increase of population, the traditional courtyard housing that originally serves a large single family had to meet the needs of multiple families. As a result, the hierarchy among units got weakened and gradually disappeared. The width and depth of each unit were equal. In addition, the traditional courtyard housing was one-floor, but some Courtyard-type Lilong housing began to build the second floor, the rooms on which were connected by a corridor (Wang, 1987).

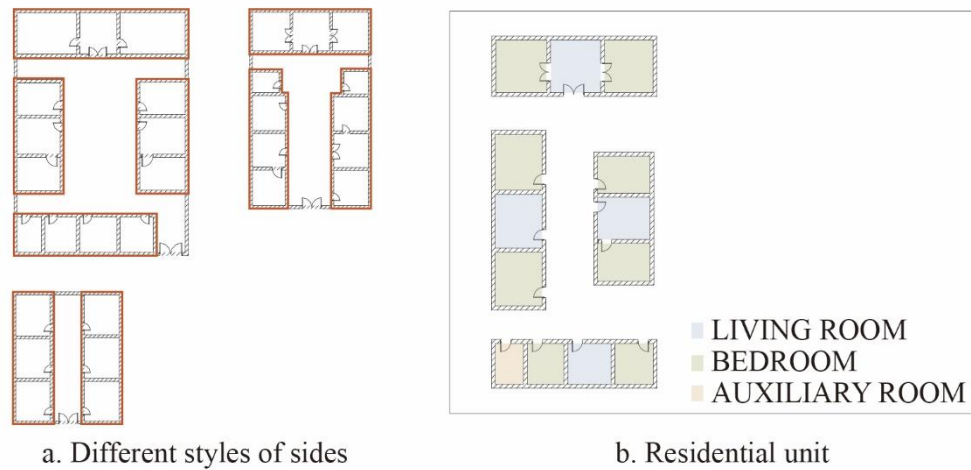


Figure 3. The phase of early Courtyard-type Lilong housing

In this phase, some different features began to appear. The number of families accommodated in a courtyard has changed from single-family to multi-family. The hierarchy has disappeared. The residential unit has progressed toward multilayer.

Late Courtyard-type Lilong housing

Compared with early Courtyard-type Lilong housing, the late Courtyard-type Lilong housing appeared slightly later than the former. After the 20th century, the urban development in Tianjin entered into a rapid stage, the construction of the concession was busy. Due to the severe shortage of land, the scale of Lilong housing decreased further. On the other hand, with the continuous expansion of western culture, the late Courtyard-type Lilong housing has not yet completely freed themselves from the constraints of traditional living styles, but has already absorbed some new forms. It was seen as an important phase of a typological process from the traditional courtyard housings to New-type Lilong housing.

The layout of late Courtyard-type Lilong housing was more varied. Some of them followed previous axial symmetry (Figure 4, a); while the others were free (Figure 4, b). On the other hand, in order to increase the land utilization rate, the area proportion of buildings increased and the courtyard decreased in this period compared with the early Courtyard-type Lilong.

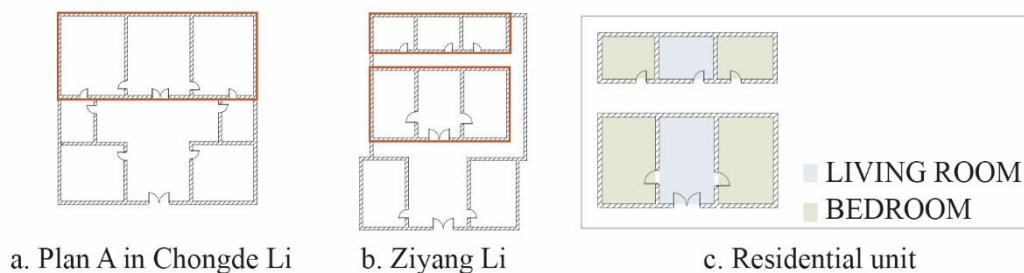


Figure 4. The phase of late Courtyard-type Lilong housing

A huge change happened in residential unit this moment. In previous phases, there were multiple residential units built separately in one courtyard. In the late Courtyard-type Lilong housing, however, separated buildings began to connect to each other. The whole courtyard turn into one new residential unit for a single-family.

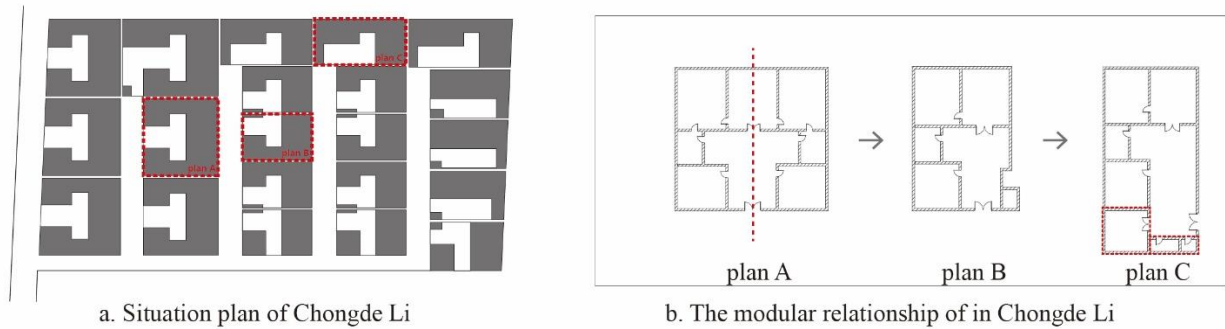


Figure 5. The transformation of residential unit in late Courtyard-type Lilong housing

The residential units had a modular relationship in the three plans (Figure 5, c). Plan B is basically cut from plan A along the central axis. Plan B adds room in depth to get plan C. Functionally, due to the decrease in width, the residential units did not adapt to the horizontal form of a bedroom-living room-bedroom any longer, but rather apt to arrange room in depth. The change from A to B to C showed the tendency from width to depth, expressing the characteristics of New-type Lilong housing.

New-type Lilong housing

Around the 1920s and 1930s, the capitalist economy had further development. The residential needs of middle and small-sized capitalists and pelagic staff were greatly enhanced. Increasing land utilization rate was crucial for the urbanization. With the advancement of building technology, New-type Lilong housing that was considered to be more influenced by the western row houses came into being (Wang, 1987).

The residential unit in this phase was a building entity of two or three layers with similar characteristics, which was repeatedly arranged (Figure 6, a). Each residential unit can accommodate a single family. Besides the basic function, auxiliary rooms were also added into the unit.

In form, the unit was smaller on width, larger in depth, and had more layers. The previous room arrangement of the bedroom-living room-bedroom was completely abandoned. The entry way was by short side. Rooms were arranged in depth. Generally, the unit can be roughly divided into two parts in depth (Figure 6, b). The front part was living space such as living room, which was adjacent to the front yard; the back was auxiliary space such as a kitchen, connected to the backyard; stairs were located in between.

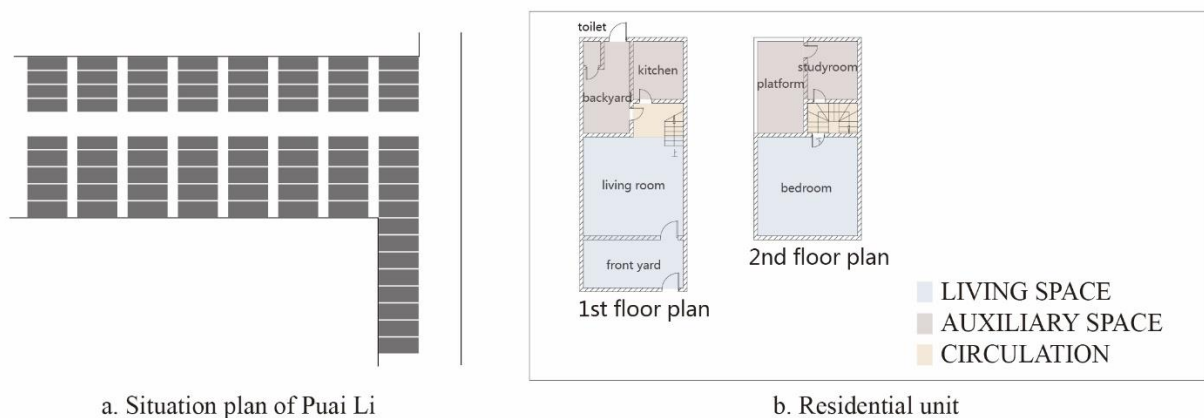


Figure 6. The phase of New-type Lilong housing

Summary

The evolution of the residential unit

Under the influence of cultural expansion and urbanization, the dwelling house tended to be more complex and intensive. The variation of the residential unit was one reflection (Figure 7).

1. The hierarchy disappeared. The unit was more and more suitable for a single family living.
2. In form, the residential unit was narrower on width, larger in depth and had more layers.
3. The way of room arrangement changed from width to depth.

In function, more specialized rooms were added into the unit. The organization of rooms was more compact.

TIME	Before 1800s	1800s~1820s\1830s		After 1820s\1830s
DIAGRAMS				
PHASES				
Traditional courtyard housing	●			
Early Courtyard-type Lilong housing		●	●	
Late Courtyard-type Lilong housing			●	●
New-type Lilong				●

● LIVING SPACE
 ● AUXILIARY SPACE
 ● CIRCULATION SPACE

Figure 7. The typological process of the residential unit from traditional courtyard housing to New-type Lilong housing

Functional Complexity and Differentiation

In the phases of the traditional courtyard housing and early Courtyard-type Lilong housing, the residential unit was only used as living space, and was separated from the auxiliary space. In the late Courtyard-type Lilong housing, with the whole courtyard developing as a new residential unit, a more complex function was included in the unit. This was more evident in the New-type Lilong housing.

At the same time, in the New-type Lilong housing, the concentrated central yard was turned into a front yard and a back yard. The function of the courtyard began to differentiate. The front yard was an extension of the living space in the front part of the unit, which was more open. It is usually used for entertainment. The backyard was connected with the auxiliary space in the back, which was more private and often used for handling chores (Wang, 1987).

Discussion

This paper is based on the Italian typological process methods. It is the first try to interpret Lilong housing by some key points of the typological process. Lilong housing was the most important buildings in modern China during the period from mid-19th century to the early 20th century. It is worth deep analysis by the viewpoint of the typological process methods, which is a blank for the moment.

Besides, many of issues still require much further discussion. For example, issue on organic levels and functional specialization. We can easily put forward questions in these aspects: how the organic level changes in the process of the type, how to measure the scalar of functional specialization. Apparently, more questions need to be answered in future.

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