SPATIAL ORGANIZATION OF SHophouses IN MARKET TOWNS IN THE CENTRAL PLAINS OF THAILAND

—The case of Talat Khlong Suan—

This paper is a part of research entitled “Formation and Transformation of Shophouse in the Old Town Areas, Thailand”. The paper aims to clarify the formation of market towns along the waterways in the Central Plains of Thailand and spatial organization of their shophouses by raising Talat Khlong Suan, a market town beside the banks of Khlong Pravit Buriram (Pravit Buriram Canal) as a case study, as a series of papers to discuss the formation of shophouse in Thailand. After Thai entered into the Bowring Treaty with England in 1855, Thai economy had greatly expanded. In this period market towns gradually developed in the Central Plains by using channel network as a means of transportation, while shophouses were built in these market towns as well. Shophouses of Talat Khlong Suan seem likely to have a simple spatial organization but no shophouses are identical in spatial composition. The original spatial organization in shophouses is the composition of two-storied structure in the front part and open well in the rear part but extension and alteration were done by dwellers mainly in rear open well spaces. According to the extensions, shophouses gradually gain wider floor spaces over the open well area which finally turns the shophouses to have complete two-storied structures along the depth without open well spaces.

Keywords: Shophouse, Market town, Talat Khlong Suan, Khlong, Spatial organization

1. Introduction and Research Objective

The purpose of this research is to identify the major socio-economic and physical factor that influenced the formation and development of shophouses in market towns along the waterways network in the Central Plains of Thailand. The case study is done on Talat Khlong Suan, one of the major market towns along Khlong Pravit Buriram on the east of Bangkok (Fig. 1). This paper, in particular, brings into focus the spatial characteristics of market towns and analyzes the spatial structure of their prime architecture, shophouses, which is unique to market towns of Thailand. The reason that market towns were selected for making research is that they possess the shophouses which have the different shape from what we previously surveyed and this paper will be a part of an ambitious research project named Formation and Transformation of Shophouse in the Old Town Areas, Thailand.

After Thailand entered into the Bowring Treaty with England, quantity of export of rice had gradually increased. Major rice farming areas were in the Central Plains of the kingdom. Water resource and good transportation was needed for rice farming for selling and exporting. Thus, at this period many canals were dug in order to link main rivers together and open new area for rice farming. With the advent of business dealing along the water courses, market towns were constructed and developed by Chinese who played a vital role in trading and building of market towns. Talat Khlong Suan is one of many market towns that took shape according to this socio-economic mechanism. The objective of this research is developed from the above perspective, and thus will clarify the formation of Talat Khlong Suan along with its shophouse, and analyze the factors that shaped their built form and spatial characteristics. At the last chapter, spatial organization of shophouse and its transformation will be discussed as well. The study is based on the field work conducted in September 2003 and August-September 2004. Up till now, there is no research work on Talat Khlong Suan about its planning and architecture but there are reference works about market

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towns along waterways network in the Central Plains, however so few in number. In this line of research Onsiri Panin (2001) is famous for extensive survey of market towns but the scope of research is limited to those along the waterways in the Central Plains on the west of Bangkok only. The basic studies on the formation of waterway system in Central Thailand are written in various languages such as in English by Steve Van Beek (1995) and in Japanese by Jinmai 陣内秀男 (2002).

2. Formation of Channel Network: Overview of Socio-Economic Background

Before Thailand changed her economy to modern system, economy in the villages and towns was subsistence economy due to the traditional economic administration, Sakdina system\(^2\). Rice is the main product of the country. Excessive parts of them from household consumption were paid to the state as Stuai (tax in kind), then a part was exported by the Privy Purse Bureau\(^2\) (under Sakdina system, state (king) has full right for monopoly of trade). This system of trade came to an end in 1855 when Thai entered into the Bowring Treaty with England. According to this treaty, Sakdina system was abolished, while liberal trade was put into practice. Sugar was identified by the Bowring Treaty as an export product with a great potential by the attractive prices offered in world sugar markets\(^3\). It is at this period that canals were constructed to open the western Central Plains to sugar-cane cultivation. Between 1855 and 1868, four canals, initiated and financed primarily by royalty, were dug (Fig. 2, Table 1: Code 6-9). After King Rama V ascended to the throne in 1868, he began modernizing Thailand's administration and economy. At this time, waterway was regarded as a catalyst for development and an advance technology was utilized in canal digging process\(^4\). The system of channel comprised two phases. The first phase (1868-1885) dug canals to convey sugar-cane between plantations in the west and Bangkok, while the second phase (1886-1910) put the virgin land to the plow for rice cultivation\(^5\). The first phase's canals enabled conveyance of sugar-cane harvest from western basin to Bangkok by waterways with ease. This situation encouraged an expansion of cultivation area. Unfortunately, in 1870s the world price of sugar-cane plummeted due to oversupply. The problem failed to solve, therefore, subsequently, government moved its concentration to rice. Khlong Sawat Premrachakon is the first canal on the eastern basin dug in 1870-2 to float rice from Ayutthayas to Bangkok. To facilitate transportation between Bangkok and eastern towns and open new land for rice cultivation, Khlong Nakhon Nuang Khet was dug in 1876-7 from the eastern outskirts of Bangkok to Chachoengsao. These two projects were not so successful because new landowners who acquired virgin soil along both sides of canals could not cultivate their entire lands to paddy fields\(^6\). The cause is that each landlord received too large piece of land over his capability to cultivate. To get over the problem, Khlong Pravet Buriram was dug a year after completion of Khlong Nakhon Nuang Khet in order to shorten a distance between Bangkok and Chachoengsao as well. It is the first canal dug after the enactment of an act of legislation called Pragard Kud Khlong (The Declaration of Canal-Digging) in 1877\(^7\). The canal has a length of 28.7 kilometers with a width of 8m and a depth of 2m. As a new southern alternative channel to Khlong Nakhon Nuang Khet, starting at Khlong Phrakanong, it ended at the eastern entrance to the Khlong Tha Thua, which flowed into Bangpakong River below Chachoengsao city. Its construction costs were mainly obtained from the Privy Purse Bureau, while a part of them were donated by the common people who would be awarded deeds to land on the canal banks for rice cultivation purpose\(^8\). The project was crowned with so great success that newly opened lands along the canal were not enough to allot among requested persons. To answer this unmatched demand, government must cut another four tributaries to Khlong Pravet Buriram. At this period, opening new land for rice cultivation was also done in the western basin, where two canals were dug (Table 1: Code 10-11). During 1881-5, there was nothing to do with canal construction due to declining period of rice price in world market. This slack season recovered in 1886 and four canals linking with Khlong Pravet Burirum had been constructed to accelerate rice production in the eastern Central Plains following increasing demand from foreign trade after long stagnation (Table 1: Code G-J). From 1890, a comprehensive irrigation project called Khlong Rangsit was initiated in order to expand cultivation into entire virgin terrain of eastern lower basin. The government commissioned a company called Siam Land, Canals, and Irrigation Company (SLCIC) to carry out a task\(^9\). The project finished in 1904. Since then there was no construction of new canals until the end of King Rama V's reign in 1910 when transportation development was gradually turned its focus on modification of existing water courses and construction of railway and road.

3. Formation of Market Towns and its Spatial Planning

After entering into the Bowring Treaty, economy enormously expanded and at the end of the 19th century, rice became the first rank of product for export. It was mainly produced in the Central Plains but it was exported via Bangkok. In 1905/06, 98% of export rice came from the Central Plains. It means that after the Bowring Treaty, farmers changed their rice farming for subsistence level to for selling. Thus basic economic system of the town and village was gradually changed for trading aim. It was the result of a demand outside the country for rice and other products that tied towns and villages in the Central Plains with Bangkok and foreign trade. Due to this

Table 1. Year of Canal Digging in the Central Plains of Thailand

<table>
<thead>
<tr>
<th>Code</th>
<th>Canal / Salt of Chao Phya River / Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Klong Suvan                                  1855</td>
</tr>
<tr>
<td>B</td>
<td>Klong Suran                                  1856</td>
</tr>
<tr>
<td>C</td>
<td>Klong Phraakon                              1870-72</td>
</tr>
<tr>
<td>D</td>
<td>Klong Khat                                 1872-73</td>
</tr>
<tr>
<td>E</td>
<td>Klong Pravet                                 1876-78</td>
</tr>
<tr>
<td>F</td>
<td>Klong Buriram                               1876-78</td>
</tr>
<tr>
<td>G</td>
<td>Klong Nakhon                                1876-77</td>
</tr>
<tr>
<td>H</td>
<td>Klong Lom Pang                              1882-83</td>
</tr>
<tr>
<td>I</td>
<td>Klong Lom Phrae                             1882-83</td>
</tr>
<tr>
<td>J</td>
<td>Klong Tha Thua                              1882-83</td>
</tr>
<tr>
<td>K</td>
<td>Klong Phraakon and Its Branches             1882-83</td>
</tr>
</tbody>
</table>

Fig. 2: The Development of Channel Network
economic expansion, market towns were gradually developed around Bangkok in the Central Plains by using waterway network as a means of transportation due to a small road network and its poor quality. Water resource and good transportation was needed for rice farming for selling and exporting. Thus many canals were cut in order to link the existing water courses and open new areas for plantation. It was Chinese who played a vital role in canal-digging. They were not placed under Sakdina system, thus they were not conscripted for labor force but government hired them to dig canals. A flood of Chinese immigrants to the country ensured sufficient number of labor for canal dredging, while two laws, right of land ownership in 1860 and emancipation of slave in 1874 made certain that a tempting rule for the right to acquire land, and new group of manpower will accelerate an increase in rice farming area and quantity of its product. Canals not only opened up land for cultivation, provided a means of conveying product from the farms to Bangkok but gave a way for sending commodities from capital to provincial towns as well. This circle gave birth to a new class of society, merchant class, which most of them are Chinese. As Peddler, Chinese traveled by boat to villages and provincial towns, where they sold goods bringing from other places and purchased rice in return. Subsequently, some of them settled in the villages indigenously inhabited by Thai people who acquired land for cultivation from the government. Initially, these Chinese made their living by doing labor work or small trade. Thanks to their industrious and thrifty inherited characteristics, they could gradually expand their small trade to a bigger business. They blended well with local Thai people, while Chinese male started to marry with Thai female. Gaining right as Thai people from marrying, they conveniently broaden their business especially rice mills and acted as key middlemen in trading.

Chinese's role as rice mill owners and middlemen in trading made town a business hub. Using unobstructed waterway, rice and other goods were easily conveyed to Bangkok and other towns, while unobtainable products from other regions were transported to the town in return. Town became a center of buying and selling food and products where farmers in the same vicinity also sailed to for selling their products directly and buying back other goods. Due to an increasing number of trading boats in canal, trade gradually moved toward the land side where waterfront market was formed. Beside the banks of a canal, simple structures utilized as temporary shops were originally built, where temporary outdoor market, Talat Nat, was held on the surrounding outdoor spaces. Thereafter, still a simple but permanent and larger structure was introduced for market which then was extended into more complex structure by building annexes for market spaces, which in many cases they were surrounded by one-storied buildings used for living and trading at the same time. These surrounding one-storied buildings were developed into the manner of two-storied shophouses used as shop on the ground floor and residence on the upper floor afterward. With the advent of shophouses, trade could be performed anytime because merchants could do business activities and dwell in the same place making market finally developed into the real market town (Fig. 3). According to the aforesaid socio-economic reasons, market towns commonly formed by a similar pattern along the channel network in the Central Plains. A small network and poor quality of roads also encouraged the location of market towns to stick to the banks of waterways.

4. Talat Khlong Suan: Formation and its Spatial Planning

Market towns are commonly developed from waterfront markets located beside the banks of the principal waterways full of many scales of traffic boats and merchant vessels, and Talat Khlong Suan makes no exception. Located on the banks of Khlong Pravit Burirom, a major canal linking Bangkok with Chachoengsao, Talat Khlong Suan is one of many market towns formed along the canal-start from Bangkok side: they are Hau Takae, Luang Pang, Preang and Khlong Suan. Among them, Talat Khlong Suan is different from the others by its unique location at the intersection of Khlong Pravit Burirom, Khlong Khwang Krun and Khlong Phya Nagaraj. It is also located in a borderline between Samut Prakarn province and Chachoengsao province (Fig. 4). Talat Khlong Suan is comprised of two markets, east market in Ban Pho district of Chachoengsao province and west market in Bang Bo district of Samut Prakarn province, separated by Khlong Phya Nagaraj. Shophouses and other facilities in both east and west markets are the fruits of success in rice mill business of market owners which can be attested by the remains of old-fashioned structures of huge rice mills in both markets. The east market was firstly built before 1901 by three Chinese sisters into one-storied wooden buildings: consequently, it was originally called Talat Sam Pee Nong (three sisters market). The buildings were originally roofed with nipa leaves and the passageway between the buildings and the banks of a canal was an earthen floor. All was later demolished for construction of the present two-storied shophouses in 1934, but the passageway was still an earthen floor. The west market is a fortune of Chinese family named Assawanich, who originally built the first groups of buildings in the west market around more than 100 years ago into the same fashion of those built before 1901 in the east market. When the existing shophouses were built is not clear but by the similarity of facade designs, decorations and materials with those in the east market suggests that they were built in the same period. All 89 units of existing shophouses (43 units in the east market and 46 units in the west market) in both markets form a long linear structure running parallel with the canal and give a distinctive feature to the passersby in the canal due to their long consecutive roof. The number of shophouses will much more than this, if some of them were not burned down by a fire. On the both tips of rows of shophouse are the locations of rice mills. Right behind these rice mills and rows of shophouse are facilities that make market a perfect town such as housing, police station, garage, health center and municipality office. There are joss house and Chinese community house in the town compound as well. They signify that a large number of Chinese people live in the town, while Wat Khlong Suan and Alwartorneya Mosque are located on the opposite side of the town across the canal. Interestingly, the west market is actually a moated town. Except Khlong Pravit Burirom and Khlong Phya Nagaraj which
5. Shophouse of Talat Khlong Suan: Typology and its Spatial Organization

Shophouses were built into two storied wooden buildings roofed with corrugated iron. In front of shophouses, the passageway was once an earthen path stretching to the bank of a canal before it was paved with concrete as could be seen in the present. The waterfront rooms in front of shophouses are not the original elements. They were added later right beside the canal after the passageway was finished in concrete and their extensions appear in various forms: enclosed room, semi open room, open room (no walls) or mere a platform protruding to the canal. Part of these extensions is built on concrete floor of passageway, while another part is extended to above the water by using wooden raised floor. Since then the role of the passageway as a transitional space linking shophouses with the canal has changed to connect shophouses with waterfront rooms instead (Fig. 5-6). Undoubtedly, frontage of Talat Khlong Suan shophouses is narrow, while the depth is long. The width of each shophouse is not all the same. It ranges from 2.5m to 7.5m, while the depth ranges from 16.20m to 29.35m depending on extensions at the rear of shophouse, and affordable space between the rear of shophouse and other buildings or a moat behind. All shophouses have a long, narrow strip of spatial planning; however none of them is alike. Accordingly, a survey of shophouse was done to examine characteristics of shophouse spatial organization. Every shophouses except closed and vacant ones were surveyed, and 68 units from the total of 89 units of them were measured (Fig. 6).

Spatial organization in shophouse is different unit by unit but, in general, it still maintains basic composition that shop is in the front, while service area is in the rear and living space is on the upper floor. The depth of shophouse is easy to alter by building a new extension (Fig. 6: Ex. No.19 and 20) or merging with other buildings behind (Fig. 6: Ex. No.67 and 69) or expanding an original building plot to the right behind area (Fig. 6: buildings without moat behind), while the width of shophouse set up at the first time of construction, is difficult to modify due to restriction from the adjacent buildings on either side. As long consecutive buildings built for the same function in a row in a certain time, shophouses should have the same width but according to surveys, they are not. Shophouses have widths as follows: 2.5m, 3m, 3.5m, 4.5m, 5m, 5.5m, 6m, 6.5m, 7m and 7.5m, but a width of 3m is the standard width applied to most of one bay shophouses. The width of 3m is also applied for construction of another two typical shophouses of broader width (Fig. 7). They are one and a half bay shophouses (4.5m in width) and two bays shophouses (6m in width).

In Fig. 7, it could be observed that in spite of each shophouse has different width, spatial order from the front to the rear of shophouse is not quite different. The front space is definitely occupied by shop space which in some cases covers far beyond inner space to a part of front passageway in order to get more commodious space behind for storage and living. Toilet and bathroom are equipped in the rear part, while stairs is equipped in the middle part of the building because in the original spatial organization, upper floor area occupied only in the front part of shophouse leaving the upper rear space as open well. At present, the open well in the rear part of shophouse still can be seen in some shophouses. It agrees with information from interviewing with dwellers that in the beginning stage of construction there was only the front room on the upper floor, while rooms in the rear part of the upper floor are new extensions. That is the reason why each shophouse has a different pattern and size of open well.

At the time of survey, except shophouse No.70 utilized for residential purpose only, all shophouses are used as various types of specialty stores dealing in specific merchandise such as handicraft, bedding, furniture, machinery, hardware, dry goods, electrical appliances, and beverage. There are grocery, pharmacy, game center, barber, clinic, restaurant and coffee shop as well. As a rule, the upper floor is generally used for living purpose, if it is not left vacant, while waterfront rooms are usually used for multipurpose functions for example: landing pier, washing area, shop, storage, dining area, and kitchen. There are many cases where dwellers do not
Fig. 6 Plan of Talat Khlong Suan Shophouses

Fig. 7 Typology of Shophouse

6. Transformation of Shophouses

Due to long occupancy, spatial organization in shophouse is altered into various patterns by dwellers, that makes each shophouse has a spatial organization of its own. The research raises an interesting example of shophouse No.49 (Fig. 9) in the east market as a representative sample for clarifying a possibility of transformation of shophouse spatial organization. No.49 is one of shophouses that have a unique composition of space. A split of the front room on the upper floor from the rear room on the ground floor makes a flow of space. The front room on the upper floor floats above the ground space used as storage. It applies a flat roof of the rear room on the ground floor as a transitional balcony linking with a stairs to the living space on the ground floor behind. The whole volume of shophouse is spacious and dazzling due to the flow of space.

Shophouse No.49 is only an example from many cases of them where spatial organization was altered from the typical model which an original spatial organization was composed of two-storied structure in the front part and open well in the rear part as already explained in the previous topic and illustrated in the upper left of Fig. 8. From the typical model, alteration or extension was done to shophouses by the dwellers, with the result that shophouses gained more floor area and usable space but lost more open well space. Transformation may look subtle but it can be regarded as a course of gradual change ending in various patterns (Fig. 8).

From the typical model, an original spatial organization of shophouse is converted into various patterns. In pattern A, balcony is extended to the rear part with open well in the middle. In pattern B, independent structure is added on the upper floor of the rear part. It could be accessed by a new stairs. This new structure can be extended to link with the front room on the upper floor by a balcony with various sizes and designs of open well as in pattern B-1 and B-2. In pattern C, original balcony is altered into a room attaching to the original front room on the upper floor. The complete change of inner space of shophouse is manifested in pattern C-1 where an entire area on the upper floor is converted into room with no more open well space. Except for pattern C, one-storied lean-to structure in the rear part of shophouse can be extended into two-storied structure which in many cases a rear balcony is added to that extended structure.
It can be observed that usable spaces beside the canal are the derivative from extensions of projecting roof in front of shophouses forming a covered walkway between these spaces and shophouses. Only in 25 units of shophouse, these usable waterfront spaces are converted into enclosed rooms. The rest of them (64 units) keep the original open spatial characteristic. Except 21 units of close shophouses, consideration of transformation in shophouse clarifies that, in general, the dwellers still prefer to preserve open spatial characteristic in shophouse in a certain extent which can be observed in 43 units of shophouses in pattern A, B, B-1, B-2 and C where open well or double volume spaces are secured in some parts of inner spaces, as compared to 25 units of shophouse in pattern C-1 where inner areas completely lack double volume spaces.

7. Conclusion

Following the above analysis, we can conclude that free trade economy, channel network, canal-digging, coming of merchant class, expansion of farming area and changing of social law have comprehensive relationship with the establishment and development of town and architecture in the Central Plains of Thailand. Talat Khlong Suan is a good model for clarifying the role of market towns in trading circle along the channel network in the Central Plains. Shophouses are unique to market towns due to its versatile functions for trading
and living and they are evidence of Chinese success in trading. Shophouses of Talat Khlong Suan seem to have simple composition of space but each has a different spatial organization. Various patterns of spatial organization are the result of transformation seeking for broader space by building extension over open well space. Transformation may look chaotic but the process is not so complicated. An ultimate outcome of transformation is a complete change into a two-storied structure without open well space along the depth of shophouses.

Endnotes:
1. Shophouse is two-storied building utilized for doing commercial activities on the ground floor and living on the upper floor.
2. Talat means market in Thai word, while Khlong and Suan mean canal and garden respectively.
3. The actual purpose of the Bowring Treaty was that the British wanted to expand maize markets to Asian countries as it launched the Maize Act in 1846 that provided domestic subsidies on maize production and trading. Therefore, the Bowring Treaty was the first wave of trade liberalization intruding in Thailand.
4. The word 'Sukkna' was found used in the sixteenth century to refer to 'positions in a socio-political hierarchy underpinned by economic relations. The position was differentiated by amounts of land allocated.
5. The Privy Purse Bureau (PPB) was established as a Department of Ministry of Finance in 1890. It was developed from Phra Khlong Khaeng the in the reign of King Rama II. It was the king's personal institution for organizing money and property. Bureau of the Crown Property took the place of the Privy Purse Bureau for overseeing its property and benefit in 1899.
7. Modern machines were introduced into canal-digging process instead of using only manpower.
8. Steve van Beek, op. cit., p. 122-123.
10. The government enacted this legislation in order to control good use of lands along newly dug canals for the most beneficial result.
11. Interestingly, instead of money, a way to economize the budget is to pay Chinese laborers by Opium. For more detail, see Piyanart, op. cit., pp. 38-39.
12. SLCIC is the Thai and Italian joint venture company established in 1888, when it gained a monopoly of canal-digging for Khlong Rangsit Project from the government. Because the complexity of the project required Western know-how and machinery, the Thai government commissioned the company to carry out the work. It thereby gave private interests a virtual monopoly on canal-digging and land development throughout the kingdom for the next 25 years. For detail, see Steve van Beek, op. cit., p. 125 and Piyanart, op. cit., pp. 42-45.
13. A market held at a stated time and place.
14. Market town is different from ordinary market. Basically, as a hub of trading, except market, market town is composed of a variety of facilities that a small town should have, such as housing, police station, health center, temple, joss house and community house.
15. This supposition corresponds with information gained from interview with many shophouse inhabitants that their buildings were constructed around 60 years ago.
16. Joss house named Pun To Kung (本宮公) was originally constructed more than 100 years ago into a small wooden shrine. An existing concrete structure was moved to the Suan Temple Institute for the old one. Chinese community house called Peng An Dao (平安堂) is more than 100 years of age. The original building was built of wood and roofed with nipa leaves. It was replaced by the present concrete building on the same location. Both buildings are testimony of strong Chinese community in Talat Khlong Suan.
17. Wat Khlong Suan (Khlong Suan Temple) was established in 1887, while Alwartormeya Mosque was founded in 1851. The original structure is Thai style wooden building covered with gable roof. It was replaced by existing concrete building constructed in 1966.
18. In 2004, Association of Siamese Architect (ASA) awarded a prize of excellent community for architectural interest of Talat Khlong Suan, making it renown in public as a place of nostalgic Thai ambiance.
19. The depth is measured from the front entrance of shophouse to the end limit by building structure or open space in the rear. It does not include an area of front passageway and waterfront room in front of shophouse.

References:
13) Reid-Arnett, Elizabeth E. 1995. The Building of a Thai Street:... [Continued on the following page].
和文要約

本稿はタイにおけるショップハウスの成立と変容に関する一連の研究の一環である。これまで、バンコクのラッタナコン地区におけるショップハウスの導入とその変容過程、また類型について考察を明らかにしてきた。バンコクのショップハウスはシンガポールのモデルを導入したのであるが、タイには他にいくつかの類型が存在する。そのひとつが華人（チャイニーズ）が直接移入したケースである。続いて、古くからの港町であるパタニを調査対象として、別類型を明らかにした。その形式はバンコクのケースと大きく異なり、細長い敷地をとる例えばマラッカのものに近い。そして、増改築のパターンもバンコクのものとは異なっている。本稿では、タイの運河沿いの市場町に注目してさらに第三の類型として、もう一つのショップハウスの類型をトラート・クロンスウォンについて明らかにした。木造であり、タイにおけるショップハウスとして、他にも多く見られる。いずれも、チャイニーズによって導入されたものであるが、その典型である。前稿同様、さらにその空間構成の変化についても分析・考察した。

（2005年10月18日原稿受理、2006年4月7日採用決定）