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Study on spatial characteristics of vernacular settlements in Hebei Jingxing

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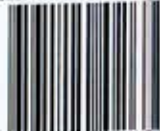
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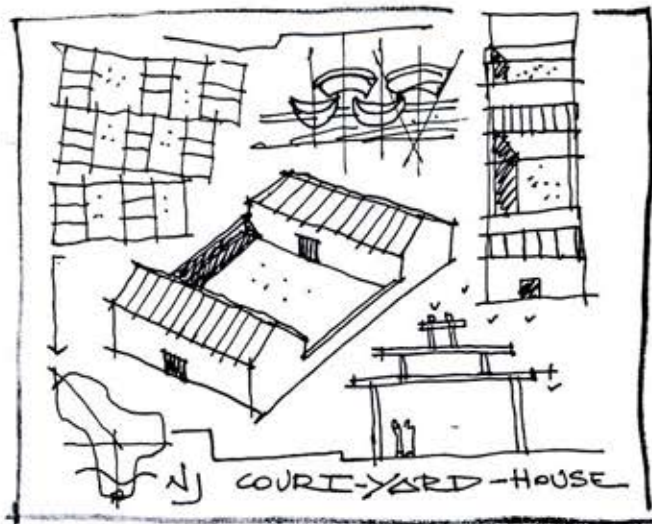
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# 再写形态学 WRITING MORPHOLOGIES

edited by Marco Trisciuglio



texts:

*Emanuele Cavaglion, Giovanni Cavaglion, Zaira Colombo, Andrea Cosentino,  
Valerio De Biagi, Simone Devoti, Lei Jiang, Xiaoxu Liang, Elena Pressacco.*

INDEX

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Wuxi, Southeast University Campus  
November 2017

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INDEX

- The wall and the column** 7  
墙和柱子  
*Marco Trisciuglio*
- A discussion about the morphological interpretability of Chinese city** 13  
试论中国城市的形态可读性  
*Lei Jiang 姜蕾*
- Morphological metamorphosis of the Nanjing's old southern town. The case of Hehua Tang** 23  
南京老城南的形态蜕变，荷花塘案例  
*Emanuele Cavaglion, Giovanni Cavaglion, Zaira Colombo, Andrea Cosentino*
- The Vacancy through the urban morphology** 33  
城市形态学下的空置问题研究  
*Elena Pressacco*
- The shape of the local communities** 43  
当地社区的形态  
*Simone Devoti*
- From strenght to robustness in structures: learnings from the biological robustness of nature** 53  
从结构强度到结构稳定性：向自然中的生物稳定性学习  
*Valerio De Biagi*
- Study on spatial characteristics of vernacular settlements in Hebei Jingxing** 61  
河北井陉传统村落空间特征研究  
*Xiaoxu Liang 梁晓旭*

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## STUDY ON SPATIAL CHARACTERISTICS OF VERNACULAR SETTLEMENTS IN HEBEI JINGXING.

河北井陘传统村落空间特征研究

Xiaoxu Liang 梁晓旭<sup>1</sup>

Jingxing, formed in the Ming and Qing Dynasties, is located in the mountainous area bordering Hebei Province and Shanxi Province. This paper takes 3 villages of Jingxing as examples to analysis morphological data on four aspects: the reasons of settlement forming, the texture of streets and alleys, the courtyard space and residential building features, trying to sum up the general characteristics of local traditional settlement.

**Keywords:** Vernacular settlement, Spatial characteristics

河北井陘位于河北省与山西省交界的山地区域，是形成于明清时期的传统聚落。

本文选定井陘的三个村落，从四个方面：聚落的形成原因，街巷肌理特征，民居的院落空间及民居建筑特色进行数据类比和形态分析，试图归纳出当地传统聚落的一般特征。

**关键词：**传统聚落；空间特征；形态学

STUDY ON SPATIAL CHARACTERISTICS OF  
TRADITIONAL SETTLEMENTS IN HEILONGJIANG

Abstract

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Key Words: Traditional settlements, spatial characteristics, Heilongjiang

1. Introduction

2. Research Methodology

3. Results and Discussion

4. Conclusion

5. References

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### I. Settlement patterns

The traditional villages of Jingjing in Hebei are located in North China. In this area, including Beijing, Shanxi and Hebei provinces, the natural environment and cultural environment are relatively close.

Residential buildings and courtyards locate following the slopes, forming a variety of elevation and open space, saving more spaces at the same time, Table 1.

### II. Street texture

Almost no street can be seen from the entrance to the exit directly. The sight is interrupted by the changing height and sudden corner. The reason is the need of strategic defense. It is very convenient for local residents to escape, since they are really familiar with the roads, and it is very detrimental to alien invasion.

Public areas are often located at some irregular open space at the intersection of the streets or corners. Most of them are in the center of the village for an easy evacuation. They usually use pebbles to spell into a variety of patterns for decoration, Table 2.

### III. Courtyard layout

Overall, the proportion of Siheyuan (four sides of houses) is smaller. It only takes about 20% of the total number. Sanheyuan (three sides of houses) is the most popular style due to the poor local economy, Table 3. For instance, Yujia Village and Liangjiang Village have a larger amount of Siheyuan, Figure 2. Then we can tell that the economy conditions of them are better easily, compared to Xiaolongwo village.

Houses within the courtyard in Jingxing often use three forms of roofs, flat roof, slope roof, slope roof mixing. They are formed with no certain rules. The unique courtyard form in the area is the Sihe Building, that is, the three sides (North, East and the West) are surrounded by two-story buildings. On the contrary, the south

Courtyard type	Yujia village	Daliangjiang village	Xiaolongwo village	Total	Proportion
Front yard	28	31	47	106	22.9%
Two sides	31	42	53	126	27.3%
Three sides	54	56	31	141	30.5%
Four sides	35	33	21	89	19.3%
TOTAL	148	162	152	462	100%

Figure 1

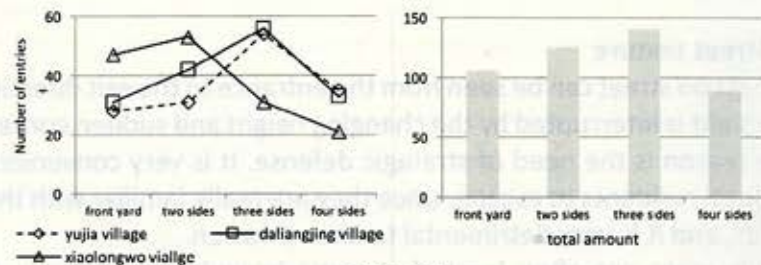


Figure 2

side houses are dispensable. The ground floor is built of stone. It is not only in a high level of structural strength, but also played a very good moisture-proof effect. The upper floor is usually built of wood or brick, to get better ventilation and lighting condition, Table 3.

Each type of courtyard has a variety of roof combinations. Some of them are all composed of flat roofs or slope roofs. But the most of them are under a combination of both. Residence choose the style according to their own financial resources and needs casually.

#### IV. Architectural elements

The roof shape of residential houses is dominated by flat roofs. The shape of roofs are closely related to the economy and the level of cultural development. The construction of sloping roofs is costly. It takes more human and material resources. Yujia Village and Liangjiang Village are in good economic conditions, so they have a relatively high percentage of sloping roofs and strict forms,

Roof style	Yujia village	Daliangjiang village	Xiaolongwo village	Total	Proportion
Slope	98	115	62	275	23.4%
Flat	277	303	320	900	76.6%
TOTAL	375	418	382	1175	100%

Figure 3

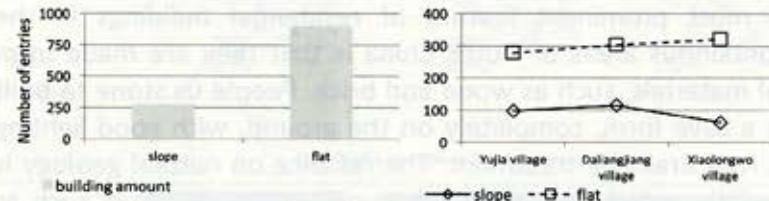


Figure 4

Figure 3. Xiaolongwo Village has the lowest proportion of sloping roofs and lots of uninhabited residences, Figure 4.

Overall, the number of flat roof buildings is much more than the number of slope ones. The roof shape of the traditional villages in Jingjing is characterized by the combination of flat and slope roofs, Figure 4.

#### V. Conclusion

By summarizing the characteristics of the architecture and the spatial characteristics of the Jingjing traditional village, such as the formation of the environment, the texture, the street space, the layout of the courtyard and the characteristics of residential buildings, a conclusion on combination is completed.

In terms of the overall layout, the mountainous area's unique external space shape strictly restricts the outline of the village. At the same time, the lower economic level of the village also determines Type and form of buildings. The natural factors are

far greater than man-made planning. As a result, different street shapes and public spaces are formed in different size and shapes. Courtyard spaces are mainly in the traditional form, but there are also some single-building style. Buildings are usually shared the outer wall. Although it maintains a compact layout as a whole, it is not deliberately pursuing a north-south position or a horizontal and vertical form.

The most prominent feature of residential buildings in the mountainous areas of North China is that they are made from local materials, such as wood and brick. People use stone to built into a cave form, completely on the ground, with good lighting and roof drainage treatment. The reliance on natural geology is very little, which can effectively avoid natural disasters such as landslides and floods.

















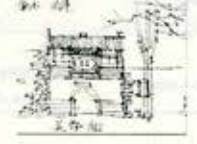

	Yuja village	Dakangjiang village	Xiaolongwo village
Location			
	They are located just near the boundary of Hebei and Shanxi province		
Traffic condition			
	There is only one railway and highway to pass by		
Geography			
	They are settled at the foot of Taihang mountain		
Shape			
	Dwelling houses are more densely distributed in low-lying areas		
Direction			
	Relationship with the Slope is regular most of the time		
Gate of the village			
	The village gate is located on the edge of the traditional sanctuary		

Table 1



	Yujia village	Daliangjiang village	Xiaolongwo village	
Shape				
The street always get along with the contour line, or just keep vertical to it				
Structure				
Main Streets are usually located in a relatively Flat area. Alleys just make a shape like fishbone				
Sight view				
The line of sight is interrupted by a constantly changing elevation and a sudden corner, creating a visual hurdle				
Public space	Stage			
	The middle of square	Entrance of the village	corner	
	Intersection of streets			
Stage as a landmark	Wide to narrow for evacuation	Small square		
Corner				
To form a platform	Forming a barrier blocking the line of sight construction	Sharp corner without chamfer processing		

Table 2

Type	Plan	Roof style	Courtyard
		Flat	
Front yard		Slope	
		Flat	
Two sides		Slope	
		Mixed	
		Flat	
Two sides		Slope	
		Mixed	

Table 3

Type	Plan	Roof style	Courtyard
		Flat	
Two sides		Slope	
	Daliangjiang village	Mixed	
		Flat	
Two sides		Slope	
	Yujia village	Mixed	
		Flat	
Two sides		Slope	
	Daliangjiang village	Mixed	

Table 3 - continue

Type	Plan	Roof style	Courtyard
		Flat	
Three sides		Slope	
	Daliangjiang village	Mixed	
		Flat	
Three sides		Slope	
	Xiaolongwo village	Mixed	
		Flat	
Three sides		Slope	
	Xiaolongwo village	Mixed	

Table 3 - continue

Type	Plan	Roof style	Courtyard
		Flat	
Three sides		Slope	
	Xiaolongwo village	Mixed	
		Flat	
Four sides		Slope	
	Xiaolongwo village	Mixed	
		Flat	
Four sides		Slope	
	Daliangjiang village	Mixed	

Table 3 - continue

Type	Plan	Roof style	Courtyard
		Flat	
Four sides		Slope	
	Yujia village	Mixed	
		Flat	
Four sides		Slope	
	Yujia village	Mixed	
		Flat	
Four sides -2		Slope	
	Daliangjiang village	Mixed	

Table 3 - continue
















Type	Plan	Roof style	Courtyard
Four sides -2		Flat	
		Slope	
		Mixed	
	 Yujia village		
Four sides -2		Flat	
		Slope	
		Mixed	
	 Yujia village		
Four sides -2		Flat	
		Slope	
		Mixed	
	 Daliangjiang village		

Table 3 - continue










Name	Survey	Proportion	Picture
Yujia village		26.1%	 
Daliangjiang village		27.5%	 
Xiaolongwo village		16.2%	 

Table 4