

明代中国において城郭村落に関する研究：宣府と大同地域を中心として

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Walled-villages in the north frontier of the Ming China: an investigation in the Xuanfu and Datong Garrisons

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To find out how *Xiang Yue*, a book of fortification technology, affected the construction of walled-villages in the Xuanfu and Datong Garrisons of the Ming China, related historical documents and nearly 1000 preserved villages were investigated. The result shows that the layout evolution underwent an integration of formal and informal patterns. *Xiang Yue* was trying to build up a new formal model for small-sized fortresses that is compatible with informal patterns. For villages, its influence is limited as an idealized model, yet the stress on the defense tower had a wide range of impacts.

Keywords: Fortification, Walled-villages, Ming China, Xiang Yue

築城術, 城郭村落, 明代中国, 「郷約」

1. Introduction

1.1 Background

In the Ming Dynasty of China, the northern frontier of the empire was heavily fortified to prevent the invasion from the Mongolians. The fortification included not only the Great Wall but also walled-cities (城郭都市) and walled-villages (城郭村落). So far, the latter two drew far less attention than the former even though they played a more fundamental role in the actual combat. Due to the vast quantity and a general poor status of the preservation, walled-villages were even rarely mentioned.

Initially, the effectiveness of these walled villages was relatively low that they were easily captured by the invaders. The reason lied in both weak fortification and disorganized defense. In the mid-16th century, the invasion reached a climax that many villagers were slaughtered or taken as slaves each year. To deal with the crisis, an unemployed official named Yin Geng 尹耕, who was born and grew up in the frontier, wrote a book entitled *Xiang Yue* (XY) 郷約 in which some principles and techniques of fortification and defense were stated. The paper aims to found out what influence did the book exert on the walled-villages.

In comparison to the standard model proposed in XY, which put stress in the effectiveness of fortification elements like gates, wall, towers and parapets, the layout of walled-villages shows more informality and diversity.

Firstly, the identity of the villagers varied from military to civilian. Those governed by military divisions known as *Wei* 衛 and *Suo* 所¹ lack of personal freedom legally—Their activities were controlled by the military officials. On the contrary, only paying taxes and doing service for the empire are obligatory for the civilians. That is why the process of fortification for the military villages started when they were established in the late 14th century while the commoners only began to build walled-villages from the beginning of the 16th century. Secondly, during the Ming Dynasty (1368-1644), different layouts were popular at different times, while the transformation from one to another was common. Therefore, a clarification of the identity, chronology and layout of these walled-villages is necessary before a judgement of the influence of XY on them is claimed.

The paper will only focus on two specific regions, Xuanfu 宣府(XF) and Datong 大同 (DT) garrisons 鎮, where the Yin Geng obtained most of his inspirations of writing the book. The two garrisons were also mostly invaded regions among the Nine Garrisons 九邊/九鎮 along the Great Wall due to their critical location that shielded the northwest of the capital Beijing (Fig.1).

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1.2 Literature Review

This part will only focus on the specific objects, the walled-villages of the XF and DT Garrisons. Generally speaking, there has not been much research in this field, and some fundamental questions were left unanswered. The reason lies in the massive stock of specimens and a lack of research clues. The existed studies, represented by Tan (2007) and Liu (2014), both took Yu County, where walled-villages dotted more densely than any other regions in the Great Wall districts (Fig.1), as research scope. By analysing several regular examples, Tan concluded a planning method based on the modulus of homesteads that each measures 3zhang \times 6zhang or 5zhang \times 6zhang (1zhang=3.2meters). He also noticed that those upright and foursquare villages adopted similar road grids by which the land was divided into blocks of homesteads. Tan mentioned *tunbu*, the military walled-villages, without further study. On the same objects, Liu's work put more emphasis on the structural transformation, physically and mentally, of the villages and villagers from the wartime to peace era. Both two researchers took a matured and formalised layout of fortification as the primary study object and avoided the diversity and informality that had shown up in their illustrations of the examples.

The matured layout had a long-term interaction with formal fortification technology which was mostly adopted by the cities and stationed fortresses. It was a compromise of the village growing pattern and the formal approach. The latter, if once existed, was also kept changing. Such a process can only be restored by a combination of architectural and historical studies through making the best use of material, graphic and literal data. As Zhai (2019) had reviewed in the study of the XF, DT and SX Garrisons, the biased use of materials, archaeologically or historically, resulted in a flaw in both comprehensive and microcosmic research. For the future, he expected a detailed survey of all the essential fortresses, more than 200, according to his estimation, in the region. Almost at the same time, Dang (2019) had done an investigation of 144 stationed fortresses in XF and DT from the viewpoint of fortification technology which concerned site selection, wall section, shape and arrangement of towers. However, the walled-villages have a more significant number and weaker preservation. Thus, a balance between the methods of the case study and general survey is necessary so that the pick of examples would not be blind but based on the comparison.

2. Research Objects and Methods

2.1 Terminology

Despite *tunbu* and *cunbu*, the use of *bu* was extensive in the official documents. Thus, clarification of these terms is necessary

before further discussion.

- ***Tun-bu*** (屯堡 fort of the soldiers who farm) refers to a fortified *tun* inhabited by soldiers who serve as part-time or full-time farmers. In local gazetteers, ***jun-bu*** (軍堡 fort owned by the army), in relative to *minbu* (民堡 fort owned by civilians), was sometimes used to replace *tunbu*.
- ***Ying-bu*** (營堡 fort of barracks), ***yuán-bian tun-bu*** (緣邊屯堡 *tunbu* at the border), and ***ju-di-bu*** (拒敵堡 fort for blocking the enemy) refer to a fortress set near the border, mostly defending a pass and guarded by soldiers. In *Ming Shi Lu*, the term *yingbu* first appeared in 1429 in issues of Sichuan², then in 1430³ and 1432⁴ of Ji 薊 and DT. Meanwhile, *yuánbian tunbu* was also used in 1430⁵ and 1432⁶ to represent border fortresses in XF and DT separately. In 1465, the first year of Chenghua Reign, an officer created the term *judibu* in his memorial to the throne⁷, which means stationed fortresses located in critical positions, distinguished from *tunbu* which distributed dispersedly or in the hinterland.
- ***Shao-ma-ying*** 哨馬營 (fort of barracks of mounted patrols), sometimes called ***ma-ying*** for short, refers to a fortress set in the remote area, generally beyond the defense line to shelter mounted patrols and scouts. In early Ming Dynasty, setting one or two *Shaoma-ying* was common for the system of a *Wei*⁸. Similar function was also fulfilled by ***Shao-bu*** 哨堡 (fort of outpost)⁹.
- ***Yi-bu*** 驛堡 or ***zhan-bu*** 站堡 (fort of courier station) refers to a fortified post station, which generally has better fortification. Moreover, ***bai-bu*** 擺堡 (fort of logistics) is a fortress used for the transportation and the store of military provisions. There were 26 of them between Tong Zhou (the north starting point of the Grand Canal) and the DT City¹⁰.
- ***Tuan-bu*** 團堡 (fort for gathering) was first used in 1470¹¹, meaning a small fort built by the local authority for the civilians. Later, the term ***cun-bu*** (fort of the village), or ***min-bu*** (fort owned by civilians) appeared to refer to a fortified village inhabited by civilians, which is relative to the term *tun-bu* and *jun-bu* respectively. Some of them were built by or under the help of the official, called ***guan-bu*** 官堡 (fort built by the official), the others established and built by civilians, called ***si-bu*** 私堡 (fort built by the private)¹².
- ***Shan-zhai*** 山寨 or ***zhai*** defines a simple fortress sited in an inaccessible place such as mountain top or upland surrounded by cliffs. It acts as a temporary asylum for the neighbouring villages, mostly adopted an irregular shape. In official documents, *shanzhai* was recorded separately

from *tunbu*. Sometimes the two kinds were called *bu-zhai* 堡寨 in short.

In order to make the statement clearer, the paper used term **military walled-village** and **civilian walled-village** to represent *tunbu* and *cunbu*, respectively. Moreover, the term **stationed fortress** will be used to represent *yingbu* and other fortresses guarded by a particular number of soldiers who are responsible for the fighting.

2.2 Research Objects

The research objects of the paper are military and civilian walled -villages within the range of the XF and DT Garrisons. It is difficult to identify the objects encompassed in these two definitions because the function, layout and identity of a specific target may change over time. Firstly, the distinguishing of military walled-villages from the stationed fortresses is necessary. Fortunately, an official named Yang Shining compiled a book titled *Xuan Da Shan Xi San Zhen Tu Shuo* 宣大山西三鎮圖說 (an illustration of XF, DT and SX Garrisons) after 1603. From then on, the whole fortification system in the targeted area changed little. The book recorded 146 fortresses among which 143 were stationed fortresses. Some were the locations of *Wei* and *Suo*, and some were of local authorities. While the three rest (Xibali 西八里, Dongbali 東八里 and Liangtiantun 良田屯) were *tunbu* strengthened in high standard. Dang (2020) had taken them as research targets and analysed their technical parameters to restore the change of fortification layout and to judge the effect of *XY* on them. Therefore, 148 fortresses (146 mentioned above plus other two exceptions) can be count out in this paper (they were shown in Fig.1 by big black blocks). Secondly, the target specimens should be confirmed and listed out. There are four conditions for one specific walled-village: a) recorded in documents, confirmable in position, and its wall identifiable in physical space; b) recorded, confirmable, but the position of its wall unknown; c) recorded but the position cannot be confirmed; d) unrecorded but its wall identifiable. Walled-villages in the condition a), b) and d) were marked on Fig.1 with black-coloured, hollow and grey-coloured shapes respectively. Lastly, military walled-villages should be separated from the civilian ones. However, according to records of different times, many military ones were transformed from civilian ones or sometimes on the contrary. In the paper, these changed specimens only showed up in their final state. Also, there were contradictions in records that one village may belong to both the army and civilians. These must be identified one by one according to collateral evidence. Luckily, they only account for a small proportion. For some of the unrecorded villages, their attribution is inferable through the locations. In Fig.1, military villages are in small squares, and civilian ones are in circles. The data resources for different

administrative areas are various. However, the whole-time interval is between the end of the Ming Dynasty and the beginning of Qing Dynasty.

To sum, there are 2415 walled-villages recorded, of which 1785 are confirmable in position, and 787 kept their walled-outline. Moreover, 279 walled villages are unrecorded. Finally, the number of physically researchable walled-villages is 1066.

2.3 Methods

2.3.1 Chronology

The dating of a settlement is still the knottiest problem for many researchers. Commonly, the study object is easily treated as a static, complete form rather than a growing, organic body. The difficulty rests with that the history of different aspects for a settlement are generally asynchronous, even for the different elements of its physical aspect.

Fortunately, military walled-villages in the Great Wall area were constructed by orders and of relatively high uniformity. Different styles are identifiable and more significantly, some of the specimens have a precise date of establishment recorded in the official document like *Ming Shi Lu* and many other local gazetteers. With the help of these clues, a chronology of walled-villages would be restorable based on which further analysis could be done.

2.3.2 Morphological Analysis

As mentioned in the literature review, the growing of a village has its pattern, which is, in most times, in contradiction to the demand of fortification. However, in both schemes designed by the Emperor Yongle and *XY*, the form of inner space for a fortress which matters in ordinary life was neglected. Thus, the knowledge of how natural pattern work with the formal standard would not be obtained through literature research. Here the direct investigation of village layout is necessary. Had it not been the public access to the satellite images, a general survey would not be possible. In the past four years, the author had been to more than 100 walled-villages in Yu County 蔚縣, the previous Yu Zhou 蔚州. The experience of fieldwork is very beneficial when trying to obtain information from an aerial image, sometimes of low resolution. Nevertheless, it is enough to judge the road system and homestead arrangement of a village from images. The two related aspects constitute the main contents of morphological analysis.

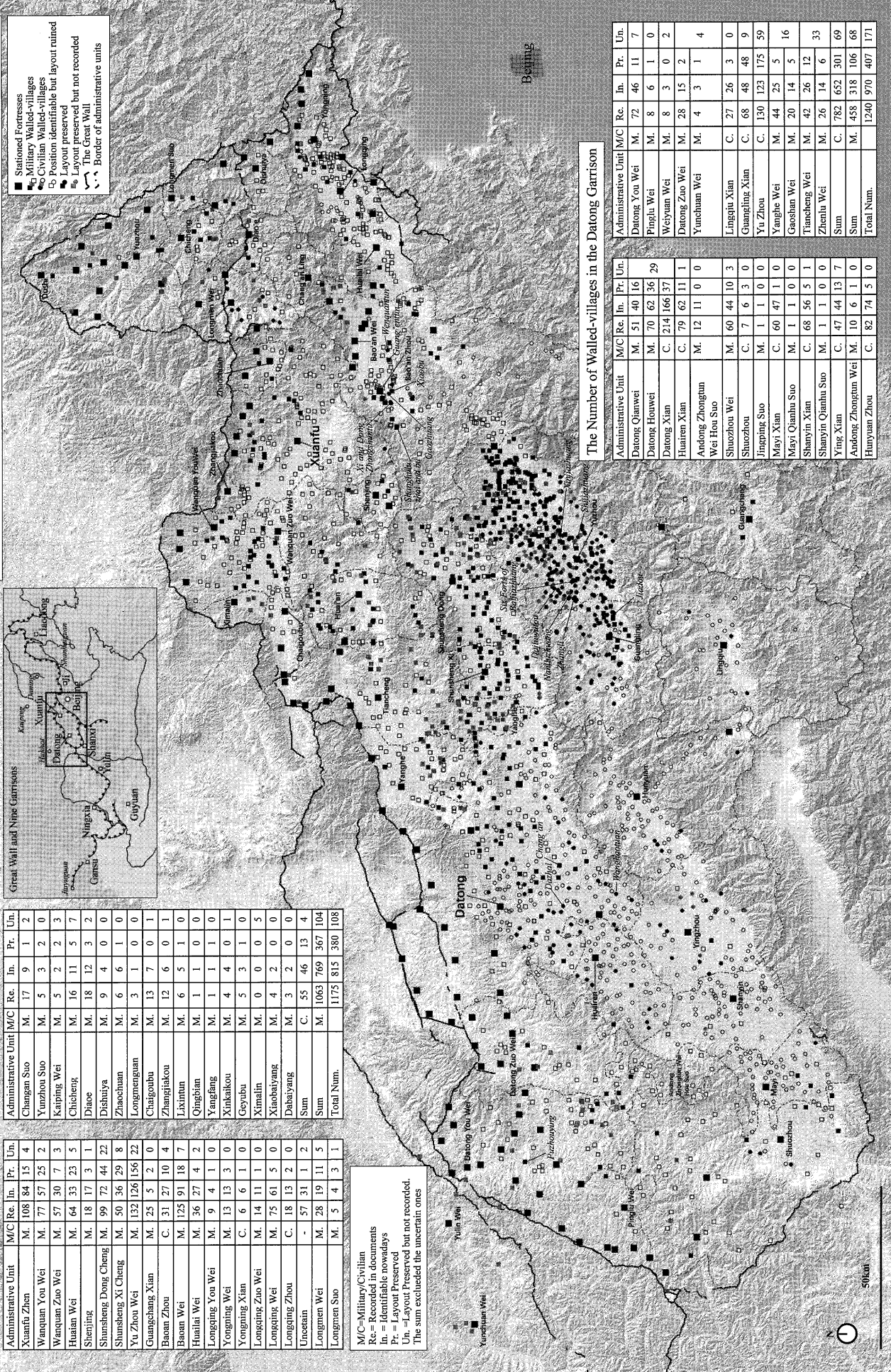
3. Construction Phases and Layout Types of the Walled-villages in the Xuanfu and Datong Garrisons

3.1 Construction Phases

3.1.1 Phase I: Hongwu to Yongle Period (1368~1424)

Generally, the establishment of *Wei* and *Suo* was accompanied by the planning and distribution of *tun* on their governed land. In the frontier and “uncivilised” area, a *tun* was likely to be fortified.

Figure.1 The Distribution of Walled-villages in the Xuanfu and Datong Garrisons.



The Number of Walled-villages in the Xuanfu Garrison

Administrative Unit	M/C	Re.	In.	Pr.	Un.
Xuanfu Zhen	M.	108	84	15	4
Chang'an Suo	M.	17	9	1	2
Yunzhou Suo	M.	5	3	2	0
Wanquan Zuo Wei	M.	57	30	7	3
Wanquan Zuo Wei	M.	64	33	23	5
Huaitan Wei	M.	18	17	3	1
Shenjing	M.	99	72	44	22
Shunsheng Dong Cheng	M.	50	36	29	8
Shunsheng Xi Cheng	M.	132	126	156	22
Yu Zhou Wei	M.	25	5	2	0
Guangchang Xian	C.	31	27	10	4
Baoan Zhou	M.	125	91	18	7
Baoan Wei	M.	36	27	4	2
Huailai Wei	M.	9	4	1	0
Longqing Yong Wei	M.	13	13	3	0
Yongning Wei	C.	6	6	1	0
Yongning Xian	M.	14	11	1	0
Longqing Zuo Wei	M.	75	61	5	0
Longqing Wei	C.	18	13	2	0
Longqing Zhou	C.	55	46	13	4
Uncertain	M.	28	19	11	5
Longmen Wei	M.	5	4	3	1
Longmen Suo	M.	1063	769	367	104
Sum	C.	1175	815	380	108
Total Num.					

M/C=Military/Civilian
 Re.=Recorded in documents
 In.=Identifiable nowadays
 Pr.=Layout Preserved
 Un.=Layout Preserved but not recorded.
 The sum excluded the uncertain ones

The Number of Walled-villages in the Datong Garrison

Administrative Unit	M/C	Re.	In.	Pr.	Un.
Datong Qianwei	M.	51	40	16	7
Datong Houwei	M.	70	62	36	29
Datong Xian	C.	214	166	37	0
Huaiten Xian	C.	79	62	11	1
Andong Zhongtun Wei Hou Suo	M.	12	11	0	0
Shaozhou Wei	M.	60	44	10	3
Shaozhou	C.	7	6	3	0
Jingping Suo	M.	1	1	0	0
Mayi Xian	C.	60	47	1	0
Mayi Qianhu Suo	M.	1	1	0	0
Shanyin Xian	C.	68	56	5	1
Shanyin Qianhu Suo	M.	1	1	0	0
Ying Xian	C.	47	44	13	7
Andong Zhongtun Wei	M.	10	6	1	0
Huayuan Zhou	C.	82	74	5	0
Datong You Wei	M.	72	46	11	7
Pinglu Wei	M.	8	6	1	0
Weyuan Wei	M.	8	3	0	2
Datong Zuo Wei	M.	28	15	2	0
Yunchuan Wei	M.	4	3	1	4
Linggu Xian	C.	27	26	3	0
Guangling Xian	C.	68	48	48	9
Yu Zhou	C.	130	123	175	59
Yanghe Wei	M.	44	25	5	16
Gaoshan Wei	M.	20	14	5	16
Tiancheng Wei	M.	42	26	12	33
Zhenhu Wei	M.	26	14	6	6
Sum	C.	782	652	301	69
Sum	M.	458	318	106	68
Total Num.		1240	970	407	171

For instance, Xibali, Dongbali and Liangtiantun were three *tunbu* built up in 1392, one year before the establishment of 16 *Wei* that lined up to shield the north of the XF and DT area¹³. In 1395, the Emperor Hongwu used to command an officer to build the city of Yunchuan Wei and the *tunbu* around it¹⁴.

Another notable example of Hongwu period *tunbu* is located to the southeast of the DT City, named Wanghao-tuan 王皓瞳. The carving on one of its bricks reads “Wujie General Zhang Gui built the fortress in the 18th year of Hongwu period (1385) 洪武十八年武節將軍張桂建”. Wanghao-tuan fort has a square plan with a perimeter of 820m. Its main road stretching from east to west which goes through a pavilion temple in its middle point. The road connects the two main arched gates, out of which two semicircle-shaped barbicans were added to give extra protection. The two ends of the barbican wall are connected to two platforms projected from the wall body. On its four corners, rectangular towers were protruding outwards diagonally. Four branch ways parallel to the main road and lead to the gate of each house. In the direction of north to south, a tortuous passage intersected the main road at the point of the temple. Along the inner side of the wall, the broad circular road was set like pomerium of a Roman fort. The semicircle-shaped barbicans and wide circular road were rarely found in later fortresses. Thanks to its presence, some characteristics of early *tunbu* can be identified upon which other fortresses share the similar features may also be inferred as relics of the same era. For example, the Dazhai-bu 大寨堡, which has an approximate perimeter of 800m, also uses a semi-circle barbican at the west gate with the same structure.

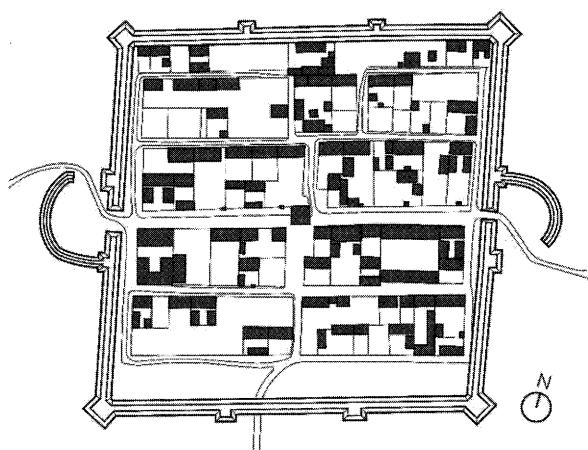


Figure. 2. The plan of Wanghaotuan Fort. (1:4000)

Since there were very few Hongwu Period *tunbu* in XF and DT recorded in detail and preserved in initial layout, six forts built up in 1378 in the SX Garrison (Table.1)⁴¹ may help us to outline the form of *tunbu* during this time. The perimeter is between 213m to 428m, and the wall height is between 4.8m and 5.44m (1.5 ~ 1.7 zhang). They all have one gate, mostly set on the south wall.

Table. 1. Hongwu Period *tunbu* in the Shanxi Garrison

Name of the <i>tunbu</i>	Year of esta.	Perimeter (m)	Wall Hei. (m)	Gate Num.	Gate Direc.
Nanping	1378	392	4.8	1	South
Shifo	1378	261	4.8	1	South
Chuanhu	1378	330	5.44	1	South
Shijiazhuang	1378	213	4.8	1	South
Sanchakou	1378	428	2.56	1	West
Dinghe	1378	336	5.12	1	South

To sum, there were possibly two sizes of *tunbu* in the Hongwu Period that smaller ones have a perimeter between 200 to 450m while bigger ones around 800m. Represented by Wanghao-tuan, the fortification of the big *tunbu* are of high quality.

As for *cunbu* of the Hongwu Period, the Chenghua version of *Shanxi Tong Zhi* 成化山西通志 (CHSXTZ) documented 4 with the suffix of *-zhai*. However, they are all located on flat ground. Their perimeter is of variety, ranging from about 200m to more than 1000m (Table.2). The wall height is generally 4.8m (1.5 zhang), and so is the moat depth. All four of them have one gate. It is noteworthy that the relic of Jiadou-zhai 加斗寨 keeps a perimeter of 850m, and has four blocks divided by two cross-intersected roads (Fig.9). Even though it is hard to assert that the layout had been established during the Hongwu Period, such a way of planning is more likely to be seen in settlements of the urban level. Moreover, a group of walled-villages with similar layout are found near Jiadou-zhai, showing a constant effect of such form. In 3.2.4, fortresses of this kind will be discussed.

Table. 2. The list of *cunbu* constructed during the Hongwu Period

Name of the civilian fort	Perimeter (m)	Wall Hei. (m)	Moat Dep.	Gate Num.	Gate Direc.
Jiaoshan-zhai	1135	4.8	4.8	1	South
Jiadou-zhai	870	8	6.4	1	South
Tuling-zhai	310	4.8	3.2	1	South
Wafang-zhai	204	4.8	4.8	1	East

In 1404, General Zheng Heng 鄭亨 reported to the Emperor Yongle that the constructions of *tunbu* in XF area were finished. The action was to obey an earlier command that “do choose one *tunbu* out of several near ones, and make its wall solid, moat deep and gates as much as possible”¹⁵. Then in 1414, he sent an official to inspect the *tunbu* construction in Ningxia, Gansu, DT and Liaodong districts before which the Emperor even gave the technical parameters of a strengthened fortress—It should eight-gated, surrounded by a wall of 2.24m~2.56m or 3.2m~6.4m high and by a moat of 1.28m~1.6m or 3.2m wide and deep. Every 4 to 7 *tun* should own such a fort¹⁶. In the history of fortification,

the multi-gated design is reckoned as a symbol of positive tactic in city defense under which the defenders seek for battle outside the fortress (De la Croix, Horst1972). However, in 1422, the Emperor himself denied the positive tactic by saying “once the Mongolians came, do not fight them but wait for support. Stay in the city and do not go out far. If a *tunbu* took no landform advantages, move its residents into the city.”¹⁷

The Yongle Period inherited the two-level of *tunbu*. As mentioned, one of every 4~7 ordinary *tunbu* should be firmly fortified as the Emperor ordered. Table.3 listed the fortresses built during this period. Comparing to the standard model proposed by the Emperor, they were generally built with higher wall and deeper moat. The wall height for those have eight gates reaches to 9.6m (3 zhang), and for single-gated ones reaches to 4.8m (2.5 zhang). Following the order, 9 out of 13 fortresses have set eight gates, correspondingly 12 wall houses were built (one above each gate and corner tower, as Fig.4 shows). The perimeter of the wall falls into a range of 400m to 850m and the depth of moat of 3.2m to 9.6m (1 zhang to 3 zhang). The high standard might result from the Emperor’s

Table.3. The list of *tunbu* constructed during Yongle Period

Name of the <i>Tunbu</i>	Year of esta.	Peri-meter (m)	Wall Hei. (m)	Moat Depth (m)	Gate Num.	Wall House Num.
Changyi	1403	1664	-	3.2	8	
Nuanhui	1404	448	4.5	-	-	
Chang’an	1404	717	9.6	9.6	8→2	
Songquan	1404	384	9.6	8	8→1	
Manliu	1404	896	9.6	6.4	8→1	
Hongzhou	1404	410	9.6	9.6	8	
Baideng	1411	840	9.6	4.8	8	12
Maoerzhuang	1411	1742	4.8	-	-	
Pingfanzhen	1411	594	8	3.84	-	
Zhaoma	1411	416	9.6	4.8	8	
Shenwuzhen	1413	768	8	4.8	8	12
Wufo	1413	771	6.4	3.2	8	12
Hezhi	1413	576	4.8	3.84	1	4
Dayucun	1413	582	5.12	3.2	1	4
Dongyaowang	1413	538	5.12	3.2	1	4
Sancha	1413	517	4.8	3.84	1	4

Table. 4. The list of *tunbu* without record time of the establishment

Name of the <i>Tunbu</i>	Peri-meter (m)	Wall Hei. (m)	Moat Depth (m)	Gate Num.	Wall House Num.
Xincheng	608	8	4.8	8	12
Daliushu	627	8	4.8	8	12
Niuxin	448	8	4.8	8	12
Cangtouhe	416	8	4.8	8	12
Xiluotuo	445	8.32	6.4	8	
Shangpanzhuang	630	10.56	6.4	8	13
Mixinguan	1024	10.56	6.4	8	12
Fangcheng	1088	-	3.2	8	12

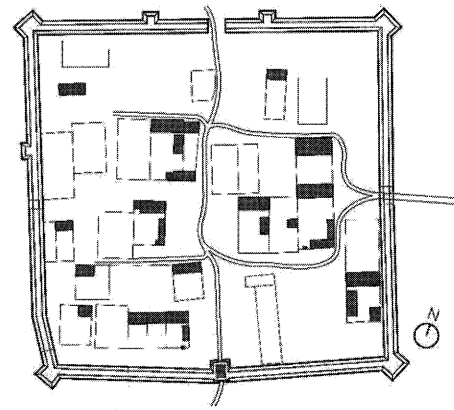


Figure. 3. Chang’an -bu. (1:4000)

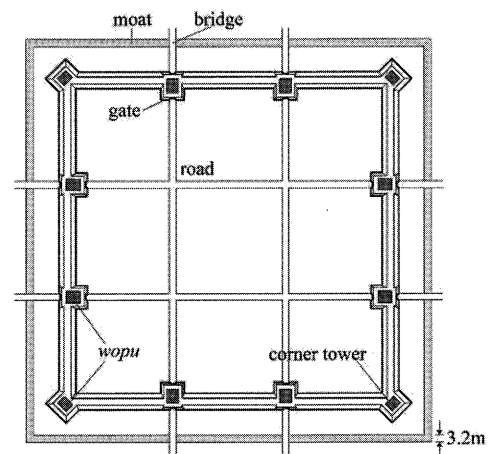


Figure. 4. The standard model of a *tunbu* in Yongle Period.

expectation of “making *tunbu* like a city”. The *CHSXTZ* also documented eight other *tunbu* with eight gates but without time of establishment (Table.4). They should also be the products of the Yongle Period.

Among the recorded Yongle *tunbu*, some cannot be found on today’s map, and some changed their layout due to a difference in the perimeter. Only Chang’an 長安(Fig.3), Manliu 漫流 and Mixinguan 米薪關 kept their initial size. However, they all failed to maintain eight gates. Comparing Fig.3 and 4, the change from a standard model of Yongle Style *tunbu* to a more realistic layout can be known. The eight gates in a standard model naturally form a road grid of 3×3. After the seal of previous gates and the set-up of the two new gates right in the middle of north and south wall (a gate that deviating from the centre would be inconvenient to those who live farther to the gate), a new axis formed while the two roads that go east to west preserved. According to the year-1514-version of the Gazetteers of DT Fu, same change happened to Manliu and Songquan 松泉. (Table.3)

To sum, the Yongle Style was the first effort that the official made to regulate the layout of *tunbu*, though overestimated the combat effectiveness of soldiers who did farm work. The partial defense tactic then turned negative.

3.1.2 Phase II: From Hongxi to Tianshun Period (1425~1464)

From the Xuande Period on, the construction of hinterland *tunbu* was no longer the focus. On the contrary, more *tunbu* were built along the border defense line (*yuanshan tunbu*) to block the passes. In 1430, according to the request of a chief officer, 39 *tunbu* were built along the north border of XF Garrison, and two years later border *tunbu* in DT were also built¹⁸. The size of these *tunbu* was much bigger than the previous ones, and a certain number of soldiers guarded them. Later they were renamed as *ying-bu* or *judi-bu* to differentiate from *tunbu*.

Meanwhile, the Yongle-style multi-gated *tunbu* were no longer used, and the new ones generally had one or two gates. The extra gates in old *tunbu* were sealed (see Table.3).

During the successive Zhengtong Period, many *tunbu* had been in poor condition. In 1443, an inspector reported that *tunbu* in DT and XF became so lax that soldiers in charge of farming lived dispersedly¹⁹. Even though the emperor commanded a fix of them but only six years later, the Mongolian army defeated the Ming army and caught the Emperor Zhengtong. As the main battlefields, the XF and DT Garrisons were severely destroyed, residents scattered and villages in ruin. The Emperor Jingtai, crowned at risk, began to reconstruct the border defense but in hard steps. To strengthen the northwest defense of the capital, many people from SX province were migrated to Baoan Zhou in 1452, by whom new *tun-bu* were built up. Such progress continued to when the captured former emperor Zhengtong was sent back. Emperor Zhengtong finally regained the crown. By the end of his second reign (1464), there were 52 *yingbu* and 79 *tunbu* in the XF Garrison²⁰.

3.1.3 Phase III: Chenghua and Hongzhi Period (1465~1505)

The overall reconstruction of *tunbu* was not on agenda until the new Emperor Chenghua ascended to the throne. The official in charge named Ye Sheng 葉盛 noted in his diary that the old *judibu* (how he calls *yingbu*) and *tunbu* were fixed, and 572 new *tunbu* were established by the year of 1465²¹. In a memorial to the Emperor, he mentioned that *judibu* has parapets and towers attached and are guarded by soldiers. While the newly built *tunbu* were in various sizes. The size of the wall was 1.6m wide at bottom and 0.96m at the top. Residents who want to build *tunbu* with moat surrounded or at the standard of *judibu* could inform

the officers for guarantee²². From his description, we know the most of the new *tunbu* were without parapets, moat, nor towers and the wall was relatively thin. The reason for constructing mass of low-quality walled-villages ascribed to two facts. Firstly, moving residents from several villages into one shelter-like fortress under an alert always caused trouble. Secondly, the Mongolians at that time seldom attack a walled-village even its wall may seem quite weak. These more than 600 *tunbu* were under the governance of a military official who was responsible for farming²³ which means the number did not include any civilian walled-villages. In 1464, the court issued a command of fixing *tunbu* in the border areas. In DT, an example of *tunbu* from this period came from the Puzhouying-bu 蒲州營堡, which was established in 1472²⁴. Different form fortified settlements in XF, Puzhouying-bu is a shelter-like fortress.

In 1470, the Ming Court began to build the civilian forts in Shaanxi Province because the scattered civilians lured the Mongolians into plundering. These forts, named *tuanbu*, were small-sized shelter like Puzhouying-bu. Moreover, the local authorities dispatched militiamen to guard these *tuanbu*.

Forts like Puzhouying-bu were widespread across both XF and DT areas. In 1500, a suggestion was raised to build one fort every 11.2km (20 li) for three or five villages in DT area for both soldiers or civilians²⁵. A monumental stone found near the outer Great Wall read that in the same year, 670 new forts were built in the DT area²⁶. Three years later, similar advice was given to the Shaanxi Garrison but with details. —Each fort should have a parameter of 153.6m (48 *zhang*), costs the labour of 500 men (average less than one *chi* per person)²⁷. Interestingly, at the same time, two examples from Yu Zhou show a different layout. Baining-bu 白寧堡 is a civilian village fortified in 1501. It is a rectangular-shaped village with one main road that goes from east to west, dividing the village into two parts (Fig.7). Another example, the Dajiuwutou-bu 大酒務頭堡 (Fig.14), was built in the same year²⁸. Even experienced a span later, it still contains a similar structure in its southeast part.

3.1.4 Phase IV: Zhengde and Jiajing Period (1506~1566)

By the year of 1513, there were 709 civilian and military walled-villages (except seven that became *yingbu* later) in the DT Garrison²⁹ and 643 in the XF Garrison³⁰.

In 1514, an inspector named Cong Lan 叢蘭 engaged himself in the defense issue of XF and DT. He commanded the villages in the hinterland to build fortresses. During the year and the next, 84 new walled-villages (62 were civilian ones) were built in DT³¹ and 31 in XF³². The number of walled-villages kept growing in the next 50 years due to the frequent invasion from the Mongolians. The border society was drawn into a rush of fortress construction. The 1561-year-version Gazetteers of XF Garrison

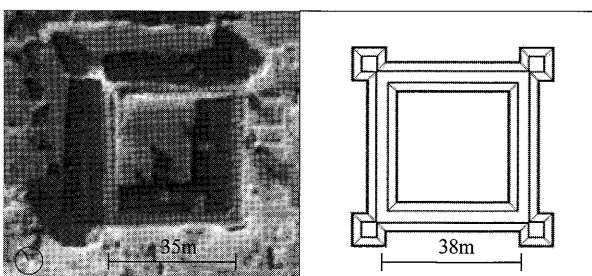


Figure. 5. Puzhou-ying Fort and the standard small *tunbu*

listed out 1039 walled-villages³³. According to *XY*, by 1550, it was common for one village to have two or more forts³⁴. Many of them were self-built ones, without the permission and help from the official. However, as *XY* said, a proportion of walled-villages were unqualified from the viewpoint of fortification. Unlike the Chinghua Period, the Mongolians began to attack walled-villages, with the help of some defectors. The result is, many walled-villages were built and finally collapsed. Taking Longqing Zhou as an example, before 1537, the year when Mongolians occasionally invaded its region, most civilians and soldiers lived dispersedly. After the severe plundering, more than 130 walled-villages were built under official supervision. Unfortunately, after 10-year-long peacetime, two successive invasions in 1548 and 1549 destroyed most of the fortified villages. Only a few survived³⁵.

From 1544 on, the new Supreme Commander Wen Wanda 翁萬達 began to solve the problem of weakly fortified villages by pushing forward a policy called *bingbu* 併堡 (to merge the forts)³⁶ by which the unqualified walled-villages would be torn down, and their residents moved into a spanned and strengthened one. *XY* was then composed to help to implement the policy. However, the whole strategy was not well-practised. In 1562, Supreme Commander Jiang Dong 江東 criticised that under the attack of the Mongolians, unfortified villages had been eliminated first. Then small and middle-sized walled-villages fell in succession. At last, only one or two out of ten big ones survived³⁷. In 1570, an official reported that there used to be more than 1800 *sibu* (privately built walled-villages) in the DT Garrison. In the constant *bingbu* movement, only 257 fortresses were chosen to be *guanbu*, which distributed far apart. Additionally, the officers only chose those small ones which are easy to defend. Therefore, *guanbu* can hardly provide enough space for the near villagers. If not for the existence of *sibu*, people cannot find shelter at all. Moreover, the local officials only reported the destroy of *guanbu* after a plundering, while concealed the condition of the vast number of *sibu*.³⁸ The policy of *bingbu* eventually brought more loss.

3.1.5 Phase V: Longqing and Wanli Period (1567~1620)

In 1571, Ming Court reached a treatise with Right-Wing Mongolians. However, at that time, no one would bet the fortune of the tottering empire on such unreliable deal. By this breathing spell, the fortification in the border garrisons levelled up. In the same year, Governor Liu Liangbi reprinted the *XY* to advocate its design of fortress. In 1573, to cope with the problem about *guanbu* and *sibu*, the Ministry of War agreed the six suggestions made by the Inspector Sun Cong. One of them was that “referring to the issue of constructing merged fortresses in DT, the layout must follow the proposals of Yin Geng’s *XY*.”³⁹ During the Wanli

Reign, the difference between *guanbu* and *sibu* was stressed in local gazetteers. Theoretically, these *guanbu* should be built at the standard of *XY*. Nevertheless, after the treatise, no more war happened to test the quality of these *guanbu*. In the local gazetteers of this period, one official who governed Yingzhou introduced his experience of organising the defense of walled-village. At the end of the article, he mentioned that “the *XY* composed by Yin Geng and published in Yu Zhou strongly worth reading and practising”.⁴⁰

3.2 Layout Types

3.2.1 Type-A: Shelter Walled-village

From 1462 to 1465, the amount of *tunbu* increased from 79 to 651 in the XF Garrison⁴². How these *tunbu* look like is hard to tell because most of them were rebuilt or strengthened later. However, one thing for sure is that the quality of them would not be as high as the Yongle Period. The official guidance put stress in the height of the wall but ignored its thickness—Only 1.6m at bottom and 0.96m at the top was supposed enough. During the following decade, a kind of small-sized fortress became popular in Shaanxi and DT area. Contrary to the thin-skinned *tunbu* built in a hurry in XF, the new style required firmness and thickness, as shown in Puzhou-ying (1470). It was designed as a temporary shelter rather than a permanent settlement. Since many fortresses of this kind preserved, they were classified as Type-A in this paper. In 1503, an officer suggested to build every 11.2km (20 li) a small fort, each has a perimeter of 154m, in a specific routine in the Shaanxi Garrison. The size was decided by how many labors one fortress would cost. 154m (48 zhang) of the wall was supposed to be built by 500 workers so that each would share only 0.31m (nearly 1 chi) of workload⁴³. Puzhou-ying fort is very close to such standard (Fig.5). It must be emphasized that the perimeter of 154m is measured according to the centerline of the wall. If added the thickness, 8m, for example, the perimeter will reach to about 180m.

According to the statistics of preserved walled-villages in both XF and DT Garrisons (Table.7,8), there are 57 Type-A forts found in DT among which 41 are of the military, accounts for 24% of their kind, while 16 are of civilian, accounts for only 4%. In XF, Type-A fortresses only come from military ones, took a proportion of 7%. The average perimeter for each group ranges from 180m to 188m, illustrates the high degree of standardisation of such type.

Moreover, the shelter-like fortresses generally have a large residential complex aside. Especially in XF, 12 small-sized shelter fortresses eventually became part of a giant fort. However, only 3 in DT experienced the same process, and they are all from Yu Zhou and Guangling 廣靈 which site near XF.

It means many forts of this kind in XF were no longer a shared facility but occupied by one specific village.

3.2.2 Type-B: Mountain/Terrace Fastness

Mountain Fastness, or *zhai* in Chinese, is a traditional kind of fortification that makes good use of landform, not only mountain top but also the riverside terrace and gully terrace. Generally, a *zhai* on a mountain top is taken as a shelter in an emergency because the inaccessibility brings trouble to the enemies in war as well as to the residents in daily life. In the hilly area, mountain fastness is more effective and safer than forts. For example, in Guangchang County 廣昌縣, more than half of the recorded walled-villages are *zhai* by 1561⁴⁴. Subjected to the landform, the size of a mountain fastness is usually small and the shape irregular. Shanghulu-zhai 上葫蘆寨 (Fig.6) of Bao'an Wei 保安衛 is a typical specimen. It is located at the top of the hill, overlooking Shanghulu-bu 上葫蘆堡, the military walled-village at the foot of the hill.

There are also many *zhai* built on a terrace near a river or a gully, taking advantage of the elevation difference. At the joint point of two or more gullies, a peninsula-like terrace or even an isolated island may be cut out. These sites were often occupied as a settlement. The cliffs would make the wall look higher and steeper and the routine to the gate more tortuous, both can increase the difficulty of sieging. Except for being lucky to find a huge "island", the size of a terrace fastness would not be as big as a settlement on flat ground, and its shape is likely to be linear, along the direction of the gullies.

In XF, as many as 56 military-villages are mountain/terrace fastnesses, account for 12% of the total. While in DT, only 7 (4%) military ones belong to this type, far less than the civilian ones (35, 9%). The difference lies in the landform features of the two garrisons. In DT, the hilly area occupied by military *Wei* and *Suo* lack of steep terrace but rich in gently rolling hills, such as DT Zuo Wei 大同左衛, DT You Wei 大同右衛 and Shuozhou Wei 朔州衛. Meanwhile, the southeast area full of ravines and gullies is mainly under civilian administration, such



Figure. 6. A bird view of Shanghulu-zhai and Shanghulu-bu

as Hunyuan 渾源, Lingqiu 靈丘, Guangling, and Yu Zhou. (Fig.1) It could also explain why military-walled-villages in DT used more shelter forts.

3.2.3 Type-C: Street Walled-village

Despite the official fortification layout which focuses on the defense and construction effectiveness, the natural growth pattern of a village and the relationship between where the residents live and farm are even more critical. As early as the 1930s, Liu (1988) had introduced the term "street village" to refer to the linearly expanded settlements he had observed in his hometown, a small county in the middle of SX Province. In his posthumous work the Gazetteers of Xugou County 徐溝縣志, such a pattern was described as below:

When a family rises rapidly, its houses will be established in rows outside of the village, giving shape to a new street. Whereas for a sudden falling one, its walls will soon collapse to bricks. If a family goes through gradual prosperity, its buildings will array along the fringe of the village. While a slow fading one will be driven to the centre, leaving the outlying courtyards in ruins. No street village can escape from such destinies.

The similar form can be seen in XF and DT area that some streets in a town are named after the family name of their founders. It is worth mentioning that the street generally runs along the latitude line for which there are two fundamental reasons. Firstly, houses in the north of China prefer to expose its long sidewall with windows to the sunshine from the south. Secondly, newly split nuclear families prefer to have their new houses built side by side, with the gable walls stand close by or even stick to each other. In this way, they are free to expand the living space by adding new houses behind the existed to form a series of house and courtyard. Also, they can share the space before their yard gates, where a street will come into being.

The development of 6 villages whose names share the same prefix "Bai-" 白 can best illustrate the form and development of fortified street village (Fig.7). In 1514, Baijiazhuang-bu 白家莊堡 (The walled-village of House Bai) was recorded in the local gazetteers as a single-walled village, while at the beginning of Qing Dynasty, as Six Forts of Baijiazhuang. The carved date of the establishment on the stone tablets on their gates can confirm such an increase in number. Among the six, Baining-bu 白寧堡 was built in 1500 (the 13th year of the Hongzhi Period), then Bainanchang-bu 白南場堡 in 1520, Baizhong-bu 白中堡 in 1521 and Baihedong-bu 白河東堡 in 1522. Baihedong-bu was rebuilt in 1569. The other two only have their date of reconstruction carved that Baihou-bu 白後堡 was in 1623 and Bainan-bu 白南堡 in 1749⁴⁵.



Figure. 7. The six forts of Baijiazhuang in Yu Zhou, redrawn from Ref. 7)

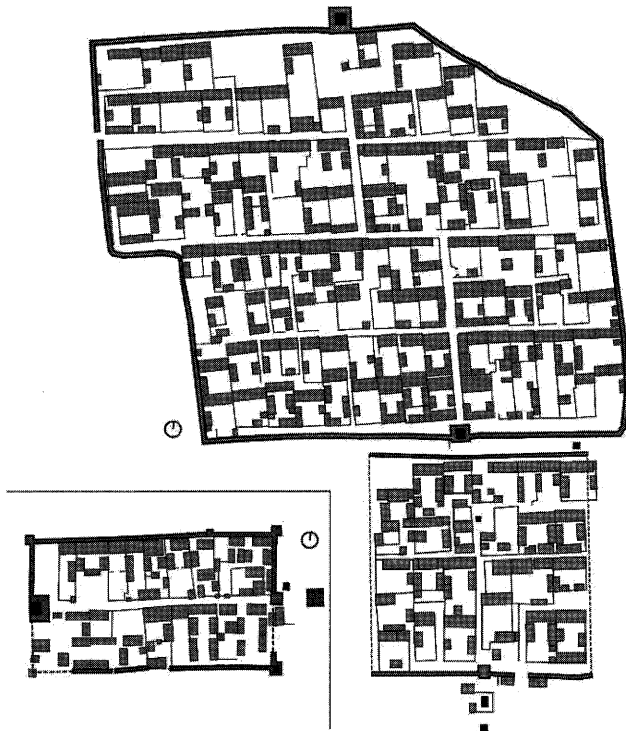


Figure. 8. Baihou-bu, Baizhong-bu and Baining-bu (1:4000), redrawn from Ref. 8)

As the earliest one, Baining-bu, the initial single Baijiazhuang-bu, is typically a fortified street village (Fig.8). Two rows of houses are arrayed at both sides of the main road. Each row contains about ten homesteads. The length of the rectangular plan is 134m (42 zhang), and the average width for

each homestead is 13.4m (4.2 zhang). The width of the fort is 72m in which each row of houses is 32m (10 zhang) long, leaving a 6m wide road in between. Each homestead is big enough to have two sets of house and courtyard. The only gate is in the middle point of the east wall, right in front of the main road.

In some cases, both ends of the road are connected to gates. Alternatively, like Bainanchang-bu and Bainan-bu, which have similar size of Baining-bu, the single gate was set on the north or south wall. Additionally, a short entryway was set to connect the gate and the main road. The north row of houses is thicker in these two forts than that in Baining-bu so that some by-passes are used to access to the innermost houses. Nevertheless, the whole structure changed little.

Theoretically, if without the restriction of the wall and the attraction of public facilities such as a well, the village may expand itself along the street endlessly. In many unfortified commercial towns, the street is generally longer. The examples of Baihedong-bu and Baihou-bu show how such a structure reproduces itself under practical considerations. More rows of houses arrayed vertically. In such condition, a gate at south or north and a stronger entryway are of necessity. The Baihou-bu can be seen as a combination of four Baining-bu. Meanwhile, the row of houses at the very bottom would allow a more direct entry due to the set of a street between the south wall and them. Obviously, the road in the direction of longitude has not gained the dominant position in street villages. Additionally, the fortified street village (Type-C) has another subtype C2, which refers to those with a vertical main road due to the restriction of landform or dominant direction of transportation in their sites.

In DT, 17 (10%) military walled-villages adopt Type-C layout, while for civilian ones, the number is 83 (21%). In XF, 88 (19%) military walled-villages are of the same kind. Type-C2 took a low proportion in both XF and DT, regardless of military or civilian.

3.2.4 Type-D: Checkerboard Walled-Village

As mentioned in 3.2.1, the layout of Xijiadou-bu 西加斗堡 resembles the urban form of checkerboard plan, only with fewer blocks (Fig.9). Besides, the road system of Yongle Style *tunbu* is of the same form. Moreover, the use of modelled block in huge *yingbu* built between the Xuande and Jiajing Period was prevalent (Dang, 2020). Even if the cross-shape road grids of Xijiadou-bu was not inherited from the Hongwu Period, possibly it had been reorganized in early phases, resembling a *yingbu* layout. In Guangling County, where Xijiadou-bu located, there are 15 big-sized walled-villages employing a similar road system, account for 50% of the same kind in DT.

The near Yu Zhou contributes another 11 specimens (36.7%), of which four are located near the east border of Guangling County.

Despite a direct transplant of layout from gigantic stationed fortresses, the checkerboarded grids can also be considered as the combination of vertical and horizontal street villages (Type-C and Type-C2). For example, in Nanliuzhuang-bu 南留莊堡 (Fig.10), the shape of each block is rectangular rather than square. If not for the strong vertical connection and division, it would be classified as Type-C. Therefore, the checkerboard base can also be created by adding a vertical axis to a “thick” street village. Some street village, like Bainanchang-bu, has already developed a “T” shape road system, dividing the village into one rectangular block and two square blocks. While Baizhong-bu (Fig.8) went one step further in which horizontal and vertical roads intersected to divided the village into four blocks. Each block has its inner road system because they are too big to allow direct entry for each house. Additionally, in some cases, blocks can be tiny. As for Xiaoshi-bu 小石堡 in Ying Zhou, the block is 36m×58m, which means 24 blocks were put into Nanliuzhuang-bu.

In DT, 28 (7%) civilian walled-villages adopt a checkerboard

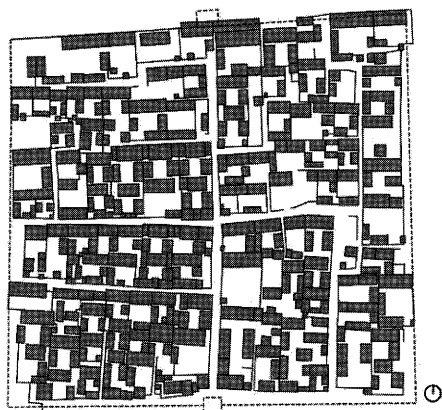


Figure 9. Xijiadou-bu (Jiadou-zhai). (1:4000)



Figure 10. Nanliuzhuang-bu (1:3000), redrawn from Ref. 8)

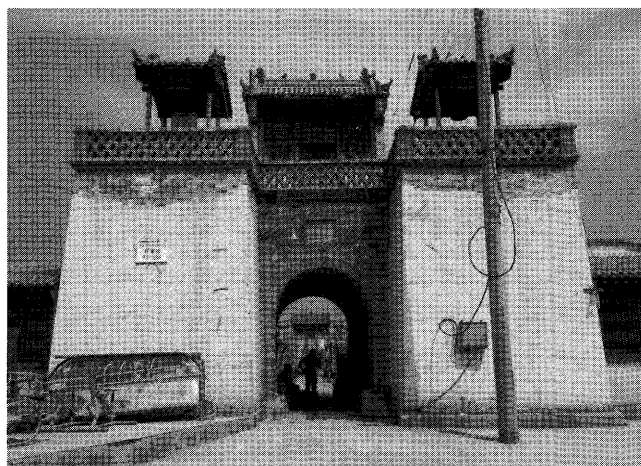


Figure 11. A glance at the gate-temple axis of Shijiazhuang-bu.

road grid. While 17 (4%) military ones in XF share the same feature.

3.2.5 Type-E: Axisymmetric Walled-Village

Under the pressure of the Mongolians, single gate is the most realistic choice for a walled-village. The gate is not only an exit of residents but also an entrance of information. People have got used to sitting and chatting under the arched door. (Fig.11) Posters carrying messages of a wedding or an obituary, and government notices are usually attached to the wall of the gate. Thus, the accessibility to the gate becomes the most crucial element to discriminate the homesteads inside a walled-village. Since the inequality brings by the single gate is inevitable, the best way is to make the difference clear and computable. Firstly, the gate should be placed on the symmetry axis to guarantee the equity of its two wings. Secondly, the central passage connected to the gate should not be utilised by any specific house as the open ground in front of its door. Therefore, no house gate shall be allowed to open towards the passage. Thirdly, the complicated and various inner road system of a block should be simplified to ensure the distance of each homestead to the gate is only decided by its position. All descriptions above sound like a commercial-residential development project, but it became a reality in XF and DT area about 500 years ago. Xinjiazhuang-bu 新莊堡 is one of the

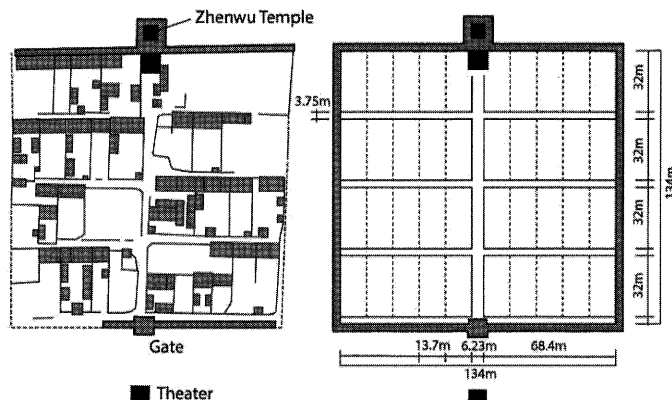


Figure 12. Xinjiazhuang-bu and its layout restoration. (1:4000)

earliest and most typical examples. It was built in 1520⁴⁶, the 15th year of Zhengde Period, whose plan is strictly a square (As we know, a square shape can produce the largest area of easily dividable land with the shortest perimeter) and axisymmetric. On its vertical axis runs the main road which connects the gate at the south end and the temple at the north. The farther a homestead is from the gate, the nearer to the temple, in which the protector of the village, usually the God Zhenwu 真武大帝, lives. Here a balance of convenience and sense of security is achieved. The temple is built on a high-levelled platform made by rammed earth, acting as a watchtower too (Fig.12). Until now, the features above are shared by an axisymmetric walled-village and some checkerboard forts. One step further, Xinjiazhuang-bu abandoned the huge blocks but used the standard layout of the street village at its left and right side. Each homestead is connected directly to the street. There are four rows of homesteads, and each measure 32m long (10 zhang). Rows are divided into two columns and each contains about five homesteads. The average width of each homestead is 13.7m, equals to 4.3 zhang (Fig.12). The whole layout can be expressed by $(5+5) \times 4$. Surprisingly, Xinjiazhuang-bu and Baining-bu share the same width of the whole village (134m).

The layout of Xinjiazhuang-bu reveals a relatively equal status for its first residents. As a military walled-village, the internal structure of its villagers, rich or poor, powerful or weak, were not reflected in the planning of the fortress. However, in some cases of the civilian villages, the innermost row was designed shorter in depth. Shijiazhuang-fort 石家莊堡, built up in 1515⁴⁷, is an example of such condition. In its original $(5+5) \times 3$ layout, the back row is only half the length of the two front rows (Fig.13). Obviously, residents who lived in the back row were in a relatively weak position.

If one compares the axisymmetric walled-village of three rows of houses with that of four rows, it is easy to know the latter is more easily arranged in an inequitable way. Table.5 shows the amount of Type-E fortresses in different plans.,

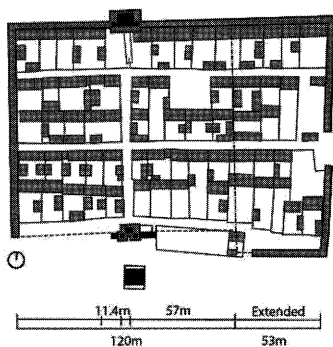


Figure. 13. Shijiazhuang-bu (1:4000), redrawn from Ref. 8)

among which $(5+5) \times 4$ and $(5+5) \times 3$ are most used. Civilian villages used equivalent numbers of each kind (15:13) while military ones prefer four rows (11:23). For the plan of five rows and six rows, the military village has 19 specimens while

Table. 5. The statistics of 92 civilian and 106 military walled-villages that adopted the type-c layout but in different house arrangement.

	C	M	C	M	C	M	C	M	C	M
	×2		×3		×4		×5		×6	
2+2	7	9	1	3	-	-	-	1	-	-
	7.6%	8.3%	1.1%	2.8%	-	-	-	0.9%	-	-
3+3	7	7	-	4	1	6	-	2	1	3
	7.6%	6.5%	-	3.7%	1.1%	5.6%	-	1.9%	1.1%	2.8%
4+4	8	5	9	9	6	10	-	1	1	2
	8.7%	4.6%	9.8%	8.3%	6.5%	9.3%	-	0.9%	1.1%	1.9%
5+5	2	-	15	11	13	23	2	4	1	4
	2.2%	-	16.3%	10.2%	14.1%	21.3%	2.2%	3.7%	1.1%	3.7%
6+6	1	1	5	-	3	-	2	-	-	-
	1.1%	0.9%	5.4%	-	3.3%	-	2.2%	-	-	-
7+7	-	-	1	-	4	-	-	-	-	-
	-	-	1.1%	-	4.3%	-	-	-	-	-
8+8	-	-	1	-	1	1	-	1	-	1
	-	-	1.1%	-	1.1%	0.9%	-	0.9%	-	0.9%
Sum	25	22	32	27	28	40	4	9	3	10
	7	9	1	3	-	-	-	1	-	-

Table.6. The number of different types in different periods.

Period	A	B	C	D	E	C+E
Hongzhi 1488~1505	-	-	2	-	1	-
Zhengde 1506~1521	1	1	6	3	15	1
Jiajing 1522~1566	-	-	12	5	41	6

civilian one only has 7. Moreover, dividing the area of a Type-E fortress by its number of homesteads, the result is 495 m² for the military and 645m² for the civilian in DT, and 617m² for the military in XF.

It is hard to assert when such layout came into being, but during the large-scale construction of walled-villages led by the Inspector Cong Lan in 1514 and the following 7 years, the axisymmetric walled-village had already been in quantity advantage compared with the other types (Table.6). Moreover, it is convinced that during the Jiajing Reign and later periods, the model of gate-temple axis became so popular that many walled-villages of other layouts tried to implant a similar axis. In Baihou-bu and Baihedong-bu, platform supported temples were built at the middle point of their north wall. In Baizhong-bu, the room is not enough for the platform, so a smaller temple is built on the ground, still being levelled by a small platform (Fig.8).

The new trend is in sharp contrast to the early fortresses like Wanghaotuan-bu, in which the most important temple was placed in the centre point of the fortress (Fig.2). There is no doubt that the religious factor played a critical role in popularising the Type-E layout. It must be mentioned that Shijiazhuang-bu is the earliest walled-village to have built a Zhenwu Temple, the proof came from a record carved on an

Table.7 The number of different types of walled-villages in the Datong Garrison and the data of their average size.

	Type	A	B	C	C2	D	E	F	C+E	Sum	Uncertain	Sum
Military	Number	41	7	16	1	2	35	10	0	112	59	171
	Proportion	24%	4%	9%	1%	1%	20%	6%	-		35%	
	Perimeter (unit: m)	188	249	502	391	928	478	494	-	370	412	384
	Area (unit: m ²)	2263	3817	16643	8210	56705	16629	16415	-	11193	12869	11771
Civilian	Number	15	34	81	6	28	128	12	11	315	63	378
	Proportion	4%	9%	21%	2%	7%	34%	3%	3%		17%	
	Perimeter	181	333	555	598	871	538	560	860	546	448	530
	Area	2022	6777	20592	21742	49364	19359	20498	43949	21107	13970	19917

Table.8 The number of different types of walled-villages in the Xuanfu Garrison and the data of their average size.

	Type	A	B	C	C2	D	E	F	C+E	Sum	Uncertain	Sum
Military	Number	31	56	88	8	17	154	28	10	392	78	470
	Proportion	7%	12%	19%	2%	4%	33%	6%	2%	83%	17%	
	Perimeter	183	289	627	674	922	555	523	792	449	496	526
	Area	2291	6219	26253	27070	57124	20505	18106	40140	14250	17911	20366
Civilian	Number	0	0	0	1	2	10	0	0	13	4	17
	Proportion	-	-	-	6%	12%	59%	-	-	76%	24%	
	Perimeter	-	-	-	877	782	506	-	-	234	506	577
	Area	-	-	-	52159	40036	16674	-	-	3846	16674	22998

incomplete stone monument erected in the temple⁴⁸.

People's eagerness of obtaining the protection from the God Zhenwu and the simple, structured layout, which would not cause too many quarrels during fundraising and homestead distribution, maybe the two key factors that made the type accounts for nearly 1/3 of the total. (Table.7,8)

3.2.6 Type-F: Irregular Dendritic Road System

There is also a small proportion of walled-villages show a variety of irregular road systems. The specific forms are of multifarious, such as comb-like, tree-like and ring-like ones. Their common point, if there is one, is a lack of vertical or horizontal main road or the main road is relatively short and dispersed into branches before fully extended. It could be the result of long-term changes, such as the expansion and shrinking of homesteads, the permanent occupation of public space, the formalisation of short-cuts. The civilian village has a lower proportion (3%) of this kind than the military ones (6%).

3.2.7 A Combination of Types: C+E

If some checkerboard villages can be regarded as the subtle combination of horizontal and vertical street villages, other collages of different types are of more rigidity. The combination of Type-A and others is ubiquitous, in which the shelter like a small fortress is usually pushed to a corner, standing alone. This kind will not be list out separately. The co-existence of a street village and an axisymmetric one is gentler but not enough to be taken as an independent type. Thus, it will be expressed by C+E. Dajiuwutou-bu (Fig.14) is an excellent example of such a combination. It was first built in 1501⁴⁹, same to Baining-bu (Fig.7,8). The stone tablet of its gate also records a

reconstruction in 1569.

The traces of the two times of construction are clearly shown on its plan. The primary fortress is very likely the small street village located in the southeast, whose layout assimilates Bainan-bu (Fig.7). The expansion of 68 years later engaged the axisymmetric plan with a slight adjustment that the right column was pushed north by a row of possibly existed houses, resulting in dislocation to the left column and a cut done of row depth. In order to make up the discount of the broken gate-temple axis, a theatre was built, facing the temple, at the cost of demolishing a section of the village wall.

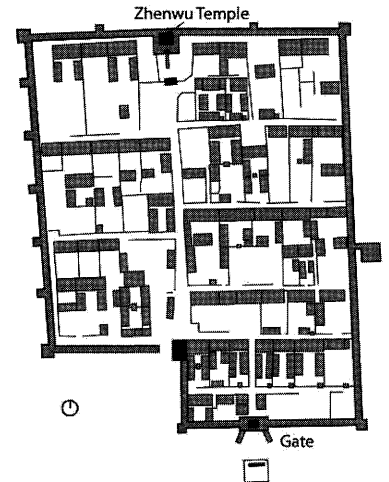


Figure. 14. Dajiuwutou-bu. (1:4000)

4. The Practice of XY on Walled-villages

4.1 As Blueprint

Dang (2018) had interpreted the contents of XY with some essential cases found in Yu Zhou and pointed out that the Zhanglibu 張李堡 is the most critical example to demonstrate the practice of XY as a blueprint. The village was "built by Court of Censors according to the text of XY 都察院鄉約明文奉修", according to its stone tablet carvings⁵⁰, in 1550, the year XY was published. The official from the Court of Censors even wrote a preface for XY. All the clues have pointed to a possibility that Yin

Geng, the author of the book, got involved in the planning of Zhangli-bu. After the discussion on the phases and types of walled-villages through hundreds of years, the review of Zhangli-bu is necessary. Firstly, the site selection meets the demand of *XY*. The village is built on a terrace facing with gullies at two and a half sides, only the north and half the west is flat ground (Fig.15). The gate is on the west wall, outside of which there is little room, making the barbican unnecessary. While in the northern direction, 20 meters away from the gate lies the flatland. The position of the gate made the best use of the landform while minimised the inconvenience. Secondly, the size of Zhangli-bu is smaller than the blueprint of *XY* (Fig.16). One may blame the narrow landform of the terrace at first glance. However, after the position of the single gate had been decided, the main road that goes west to east was determined, the length of which is 143m (45 zhang). Among the total width, the vertical road is about 2zhang wide, while the length of the wall base plus the gap between wall and houses is about 1zhang at each side. Thus, the width for each column is about 20zhang (about 64m). The measured data is 66m, just a bit shorter than the 68m in Xinjiazhuang-bu (Fig.12). To fulfil the prevalent layout of $(5+5)\times 3$, the triangular space beyond the south wall was left unused. Additionally, the disadvantage of narrowness was made up by the prolonged length. Each homestead is 48m long (15 zhang). It is undoubtful that Zhangli-bu was a carefully planned fortress, according to its conditions, rather than a copy of the blueprint. Thirdly, the wall of Zhangli-bu is as thin as 1m, and no remains of towers were found during fieldwork. However, according to common knowledge, at least the one and a half side facing the flat ground should be heavily fortified with wall and towers. Unfortunately, the north and west wall failed to survive the demolishment. Finally, different from most other walled-villages, the Zhenwu temple of Zhangli-bu is built on the ground rather than on a high platform. The abnormal condition might result from the altitude of Yin Geng towards the religion. He used to criticise the villagers praying to the god rather than taking up arms and



Figure. 15. A Bird View of Zhangli-bu.

fight⁵¹. Theoretically, to have a temple built on the platform, which could have served as a tower, weakened the defense of the fortress. However, the belief in Zhenwu was then so popular that villagers would build one by themselves, using the tower in the middle of the north wall, if there is one. Maybe Yin Geng left the position empty intentionally. If the guess is correct, the reason of the destruction of the walls and towers in Zhangli-bu would be understandable since many other villages kept fixing the wall and the platform only to keep Zhenwu temple fresh in peacetime, when military facilities lost their meaning of existence.

According to the existing materials, *XY* did not produce a deep influence until Yin Geng passed away. In 1558, some official construction of stationed fortresses faithfully turned the blueprint into being (Dang, 2020). In 1566, 3 fortresses were built between the SX and DT Garrisons⁵². Among them, Jiajia-bu 賈家堡, which belongs to SX and served as a stationed fortress, fit the *XY* format. Meanwhile, Gujiadian-bu 顧家店堡 is 1/4 the size of Jiajia-bu, which is the most massive plan if only corner towers are used and the tower gap fixed. Another case like Gujiadian-bu is Guang'en-tun-bu 廣恩屯堡, established in Bao'an Zhou 保安州 in 1582 (Fig.17). The two cases demonstrate that a smaller *XY* style layout was created and applied for the big fort (with two towers on each wall) proposed by *XY* exceeds the typical size of a village. To respond to the call of constructing *XY* style *guanbu* from the court, Bao'an Zhou established or strengthened six fortresses between 1582 and 1587 including Guang'en-tun-bu⁵³. Among the six, Xiao-bu 小堡 assimilates *XY*'s plan of the small fort (Fig.17). Additionally, according to an investigation at the beginning of the last century, these fortresses all have a height of 2.5 zhang, exactly the standard proposed by Yin Geng.

4.2 As Fortification Theory

In the system of *XY*, towers are taken as the core of the defense system. However, according to a report of Yang Bo, who was in charge of the fortification of the XF and DT

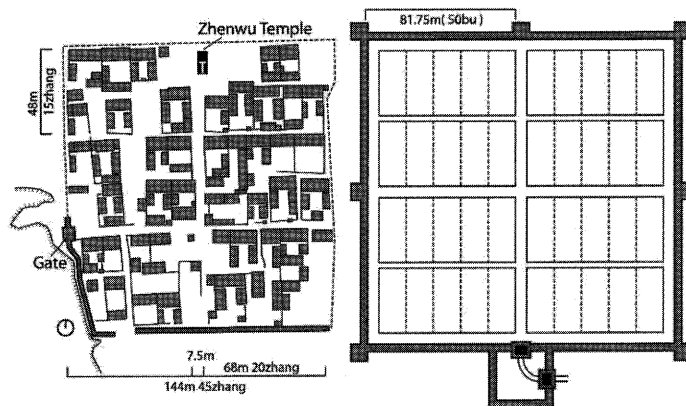


Figure. 16. Zhangli-bu and the Standard Model of *Xiang Yue*. (1:4000)

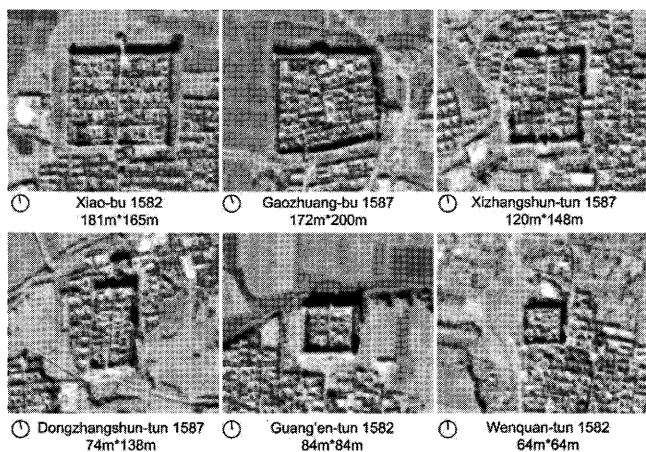


Figure. 17. The six guanbu built during Wanli period in Bao'an Zhou, redrawn from Ref. 7)

Garrisons after 1558, many fortresses he had witnessed had only a wall of thin and short, without towers attached. Then he suggested to strengthen them by constructing corner towers. Between May and November of 1558, about 80% of the project, which included 2870 towers, were finished⁵⁴. Yang Bo is the first official to implement the layout of *XY* (Dang, 2020), even though he never mentioned the book in his writings to the Emperor and fellowships. His idea of constructing towers possibly came from *XY*. According to the statistics, there are 42 walled-villages in DT using diagonal corner towers and 26 having upright ones. Before *XY*, upright towers were rarely adopted in DT, while diagonal ones attracted severe criticism from Yin Geng (Dang, 2018).

After the advocacy of Yang Bo, to make towers stronger and more condensed became the trend for walled-villages. In Yu Zhou, 18 records of construction after Jiajing Reign were in carved on the stone tablets. As in the case of Dajiuwutou-bu (Fig.14), the towers on its west wall have a gap of only 30m. These towers should be added in the reconstruction in 1569. Among the well-preserved specimens of the two garrisons, the tower gap ranges from 30 meters and 40 meters, about half the upper limit proposed by *XY*, which also accords with the Yin Geng's opinion on the towers—The more, the better.

5. Conclusion

The conclusion includes four aspects.

- The construction of military walled-villages in the XF and DT Garrisons had gone through five phases, and the last three shared with the civilian ones. In the first two phases, the fortification of military villages reached a climax during the reign of Emperor Yongle but declined rapidly after him. The third phase is a period of large-scale reconstruction in a relatively low standard. Then, during the fourth phase, the Mongolians' preference of attacking villages with weaker defense caused a competitive

process of fortification. Thousands of privately built walled-villages appeared, but about 70%~80% of them failed to survive. Nevertheless, the reconstruction never stopped until the late-term of the fifth phase, when the villagers had enjoyed years of peace.

- The layout evolvement of walled-villages experienced a decrease and a recovery of the standardisation degree. In the early stages, the fortification projects were carried out by the official with a relatively high standard, represented by the Yongle Style, of the checkerboard-like layout. Afterwards more small-sized shelter-like fortresses appeared, as well as the roughly fortified settlements in which the natural pattern of village growing, the street village, was prominent. In the fourth phase, the formal style and the grassroots style integrated into a new form, axisymmetric layout which rapidly spread out, not only for its reasonable plan but also the prevalent beliefs in God Zhenwu, whose temple seats typically at the north ending of a gate-temple axis.
- The difference of walled-villages between the XF and DT Garrisons is more significant than between military and civilian identities. Military villages in DT relied more on the shelter-like fortresses. At last, they turned into *guanbu*, the officially guarded villages. While fortified settlements in XF, regardless of their sizes, were always the mainstream. Moreover, the civilian villages of DT are similar to the military ones in XF in the proportion of different types of layouts. A slight difference lies in that homesteads were divided more equally in military ones.
- As a blueprint, *XY* did not obtain a full practice in the level of walled-villages, which the book intended to change in the first place. Zhangli-bu, possibly a specimen planned by Yin Geng himself, shows more flexibility than the standard model and respects to the popular way of homestead division. Some cases of the Wanli Period followed the proposal, after when the court assigned the book as official guidance in the construction of *guanbu*. In another hand, as a fortification theory, the book's stress on defense towers exerted broader influence under which a mass of towers was built to strengthen the existed walled-villages.

Note

¹ A *Wei* generally consisted of ten *Suo* and leads 5600 soldiers.

² Xuanzong Shilu 宣宗實錄 (Taipei: Zhongyang yanjiuyuan lishi yuyan yanjiusuo, 1964-1967), juan 57, p.5b (1358).

³ Xuanzong Shilu, juan 69, p.1b (1616).

⁴ Xuanzong Shilu, juan 87, p.10a (2015).

⁵ Xuanzong Shilu, juan 72, p.1a (1675).

⁶ Xuanzong Shilu, juan 87, p.4b (2004).

^{8, 41} Li Kan 李侃, Hu Mi 胡謐, Shan Xi Tong Zhi, 1475 ed., Rpt. Ji Nan, 1996, juan 3, pp.14a-18b (史 174-67-史 174-69)

^{7, 22} Huang Ming Jing Shi Wen Bian 皇明經世文編 (Beijing: Zhonghua shuju, 1980), juan 60, Ye Wen Zhuang Shu, juan 2, pp.17a-19a(⑤317-⑤321)

⁹ Xianzong Shilu, 憲宗實錄 juan 36, pp. 5b-6b (714-716)

¹⁰ Yingzong Shilu, 英宗實錄 juan 51, pp.6b-7a (983-984)

¹¹ Xianzong Shilu, juan 77, pp. 6a-6b (1491-1492)

¹² Muzong Shilu, 穆宗實錄 juan 41, pp.3a-4a (1013-1015)

¹³ Taizu Shilu 太祖實錄, juan 225, p.1a (3295)

¹⁴ Taizu Shilu, juan 238, p. 3b(3472)

¹⁵ Chengzu Shilu 成祖實錄, juan37, p. 1a (631)

¹⁶ Chengzu Shilu, juan 155, p. 3b (1792)

¹⁷ Chengzu Shilu, juan 249, p. 1b (2322)

¹⁸ Xu Rijiu 徐日久, Wu Bian Dian Ze 五邊典則, edited in Wanli Reign, Rpt. Huhhot, 2009, juan 5, pp.132-133

¹⁹ Yingzong Shilu, juan 107, p.3b (2170)

^{20, 21} Ye Sheng, Shui Dong Ri Ji 水東日記 欽定四庫全書 子部十二, 小說家類, juan 34, pp.3a-4b

²³ Xianzong Shilu, juan 34, p.1b (672)

²⁴ Xianzong Shilu, juan 103, p.1a (2007)

²⁵ Xiaozong Shilu 孝宗實錄, juan 168, p.1b-2a (3048-3049)

²⁶ Hu Wenye 胡文燁, Yunzhong Jun Zhi 雲中郡志, edited in Shunzhi Reign, Rpt. Datong, 1988, pp.514-515

²⁷ Xiaozong Shilu, juan 196, pp.3a-4b (3609-3612)

^{28, 44, 45, 46, 47, 49, 50} The records came from the rubbings of the stone tablets stuck in the fortress gates, made by Yu Zhou Museum and provided by Ding Yao.

^{29, 31} Chang Qin 張欽, Datong Fu Zhi 大同府志, 1515 ed., rpt. Datong, 1987, juan 2, pp.1-26

^{30, 32} Wang Chongxian 王崇獻, ed., Xuanfu Zhen Zhi 宣府鎮志, 1515 ed., rpt. Nanking, 2003, pp.79-106

^{33, 42, 44} Sun Shifang 孫世芳, Le Shangyue 樂尚約, ed., Xuanfu Zhen Zhi, 1561 ed., rpt. Taipei, 1970, pp.86-98

³⁴ Yin Geng 尹耕, Xiang Yue, 1550 ed., rpt. Zhili, 1571, National Library of China, microfilm, p.7a

³⁵ Xie Tinggui 謝庭桂, Su Qian 蘇乾, Long Qing Zhi 隆慶志, 1549 ed. Rpt. Taipei, 1909, juan 6, pp.7-9

³⁶ Sun Shifang 孫世芳, Le Shangyue 樂尚約, ed., Xuanfu Zhen Zhi, 1561 ed., rpt. Taipei, 1970, p.275

³⁷ Shizong Shilu 世宗實錄, juan510, p.1a-2a (8393-8395)

³⁸ Muzong Shilu, juan 41, pp.3a-4a (1013-1015)

³⁹ Shenzong Shilu 神宗實錄, juan 19, pp.6a-7a (539-541)

⁴⁰ Tian Hui 田蕙, Wang Youyong 王有容, ed., Ying Zhou Zhi 應州志, 1599 ed., rpt. Ying Xian, 1984, pp.29-31

⁴³ Xiaozong Shilu, juan196, pp.3a-4b (3609-3612)

⁴⁸ The contents are quoted as below: The Record of Reconstructing Zhenwu Temple..... (The village) used to be plundered by the barbarians.....In the 10th year of Zhengde Reign, I discussed with other villagers that the dangers are hard to predict and nothing yet had been done to keep us safe.....everyone agreed. Then people gathered to build a fortress, which was completed in the year..... (The gate) is toward the south and a big platform seated at the north to resist (the enemy).....Xu Zhicai and others built a temple of Zhenwu on the platform. A portrait of God Zhenwu was drawn on the wall, holding a sword, the hair hanging down loosely. Ten Generals stand besides,

commanding millions of heavenly warriors who defend the north stilly.....Afterwards, the population grew year by year, while the old fortress is not big enough to shelter all of them. People wanted to extend the fortress.....then the small platform was enlarged.....Our fortress has been secured that no dirt was stirred up by a horse. The heavenly warriors protected us quietly. In them we trust sincerely..... (The god) is always dignified and prayers are always satisfied. The latecomers should keep their belief.

The 46th year of Jiajing Reign.

⁵¹ Yin Geng 尹耕, Shuo Ye Shan Ren Ji 朔野山人集, Tianjin Libarary, microfilm juan 1, pp.21a-24b

⁵² Shizong Shilu, juan 546, p.1b-2b(8810-8812)

⁵³ Song Zheyuan 宋哲元, Liang Jianzhang 梁建章, Chahaer Sheng Tongc Zhi 察哈爾省通志, 1935 ed., National Library of China, microfilm, juan 14, pp.1-39

⁵⁴ Yang Xiang Yi Gong Zou Shu 楊襄毅公奏疏, Rpt. Beijing, 2003, Xuan Da juan 1 宣大卷之一, p.36a (367)

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