

THE DISTINCTIONS OF ARCHITECTURAL MORPHOLOGY BETWEEN TUBAO AND TULOU IN FUJIAN

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Abstract: Fujian Tubao is another kind of architectural form which is different from Tulou in Fujian province of China. This paper focused on the redefinition of Fujian Tubao, and discussed the reasons why Tubao were built, styles, distributions and properties of Fujian Tubao. Meanwhile, the similarities and differences between Tulou and Tubao were also analyzed.

Keywords: Minzhong, Tubao, earthen construction, defense

1 THE DEFINITION OF FUJIAN TUBAO

The definition of “堡(bao/fortress)” in the book “Ci Hai” is “a town built by earth”. And in the book “The History of Jin Dynasty”, there is a description as “Five thousand people gathered in Xugao and Hukong, and built Tubao to strengthen their defenses.” Nowadays, “Tubao” always refer to the defensive buildings militarily. The Chinese words whose meaning is similar to “堡(bao/fortress)” include 城(city), 壁(wall), 垒(barrier), 寨(stockade), 坞(fortified building), etc. According to the definition in the book “Ci Hai”, “城(city)” means the city wall which was built around the city as the defensive building in the past; “壁(wall)” means barracks and the enclosing wall; “垒(barrier)” has the village fort built around the military camp; “寨(stockade)” indicates the paling which used in defenses, and by extension, it means the military camp; “坞(fortified building)” is the fortress constructed outside the village as the protective screen. Most of the above Chinese words which possesses the defensive meaning carry with the “土(earth)” as Chinese character component, suggesting that the earliest military defensive constructions were built using earth as the constructive materials ordinarily.

In Fujian genealogy, “Tubao” indicates all of the Tulou and Tubao, and there are three styles: siege type, pillbox type and house-fortress type. These residential architectures with great defenses most centralize in the mountainous area in southwest and central section of Fujian province. At present, Tulou located in southern and west part of mountainous area of Fujian have become the world cultural heritages which have drawn much of the attention around the world. Meanwhile, Fujian Tubao which possess the peculiar styles and belong to the residential and defensive civil constructions, have been walking out of the mountains, and attracted the attention of experts and scholars from domestic and overseas gradually.

It needs to emphasize that Tubao landscape is mainly located in the city of Sanming but also seen in the places including many hills and knob regions in west of Fuzhou, northwest of Quanzhou and north of Zhangping county of Longyan City. What's more, “Tubao” discussed in this study refer in particular to the defensive constructions which were built with the clustered courtyard houses that were surrounded by the wall which was extremely thick and constructed using rammed earth as materials. Different from that, the city castles, county fortresses and village forts which were surrounded by the wall but had the streets and cities inside the wall, are out of our discussion, for example, Zhao Jia bao of Zhangpu county and Gong Chuang bao of Yongan county are not appropriate to be classified into the category of Tubao.

Fujian Tubao is the vernacular architecture created by the local ancestors considering the actual requirement of

defenses. The periphery was built by stacking stones as base and constructed with rammed earth as high and thick enclosed wall; on the second or third floor inside the wall, there exist the unimpeded way for horse races, the hydraulic impulse type windows, and dense gun holes that were built-in as part of the wall, and the water injection holes were placed above the door; turrets of residential towers were built in the quadrangle or suitable places of Tubao; the inside of Tubao were mostly wooden structures, constructed according to the local traditional residential styles, and there were every kind of living facilities. Tubao could not only be lived at ordinary times, but also be used at defensive times when the bandits and robbers attacked on. Some Tubao were not used normally; only when attacked by bandits, villagers or clansmen temporarily lived in there (Dai, 2003).

Since Tubao gave priority to defenses and living complementarily, their special architectural styles make them different from the defensive architectures which combined defensive region with living spaces. Due to the close geopolitical and similar appearance, Tubao and Tulou in west of Fujian, circle houses in south of Jiangxi all have certain defensive functions; however, there are also some differences in the aspects of structure, layout, etc. Some significant differences are that: the wall of Tubao does not act as the load bearing body of the building and the inner wooden structural system stands on its own, while the wall of Tulou is the load bearing wall and connected with other part of the buildings; the outer wall of Tubao is as thick as 2-6 meters, the enclosed vestibule is placed on the wall, on the contrary, the inside the circle houses are individual rooms, the outer wall is not only the defensive wall, but also the load bearing wall of every room, thus its defensive function being inferior to Tubao.

To sum up, Fujian Tubao is the unique defensive architecture located in the middle mountain areas of Fujian province, the external part of Tubao is the high and thick stone wall, and the inside is the courtyard houses which could be used to live and defend. Tubao is mostly named with “堡(bao/fortress)” and “寨(stockade)”, such as An Zhen bao, Ju Kui bao, Dong Guan stockade, and fewer is named with “堂(hall)”, “楼(building)”, such as Chong Guang hall, Ching Yuen building.

2 WHY FUJIAN TUBAO OCCURED

The main factors for the development of Tubao included the special social formation and geographic environment, but the clan organizations were the most important factor for the construction of Tubao.

Fujian is a society inhibited mainly by the immigrants of Central Plains of the Yellow River. According to the history, after the “Yongjia chaos” in western Jin Dynasty, the immigrants from the north moved to the triangle areas, and gradually arrived at sand and river basin of the upriver of Minjiang. Minzhong was the latest exploitation area of Fujian, with lots of out-coming immigrants. Abundant immigrants greatly affected the production and living of aborigines, leading to countless conflicts to strive for living spaces and production land among ethnic groups. With the unbreakable genetic connections, geographical relations and interested relationships being formed during migration among families, in order to protect home and produces, people should live together, in addition, the turbulent situation and the bandit attacks both gave birth to the fastness defensive architecture of Tubao which was one of the residential constructions which could mostly reflect the family regime style.

Minzhong is located in the basin which is consisted of the interconnected hills between the Wuyi mountains and Daiyun mountains. In Minzhong, there were rich mineral resources and fertile lands, which were suitable for agriculture, people here lived rich lives. Due to this, it gradually attracted bandit attention, and the burning, killing, and pillaging events always happened. However, the valleys here were deep, which made it difficult to interact with outside. Let alone here was bordered by many counties, governments, and provinces, and the governing county kept changing frequently in the history, then the imperial court could not take good care of those events. In order to protect the hard-earned wealth and the most important- their own lives in this special area, Tubao constructed by every family and village could be seen everywhere afterwards.

The book “The Preface of the Town of the Fortress” of Quechen village in Datian county recorded the social background and purpose of Tubao constructions as “In the ancient, it was always heard that cities and stockade villages were constructed as the protective screen of the counties to defend against the bandits. However, people lived a hard life because of the tremendous battles, in order to end the turbulent life; a Tubao was constructed in the middle of the county, named Zhen Zhong bao, etc.” In the stone wall village of Ninghua

county, a family tree described the construction situation of Tubao: "Tubao in our village is the first one. Since Junji eight years (1651), some of the rich people were gathered to donate for the construction of Tubao." Thus it could be seen that the essence of the construction of Tubao, was to gather the force of a family, a race, even a village, and to construct a fortress to defend against the bandits and provide residential places for people.

The reasons for the development of Tubao generally could be divided into four types: proactive defense, passive building, self-defense for rich and forces concentrated self-defense.

(1) Proactive defense This was the main reason for the construction of Tubao. In Tongzhi eight years of Qing Dynasty, the book "Ninhua county records" mentioned that "In Sui Dynasty, villages were attacked by lots of bandits, a Huanglian people named Luojun Wu proposed to build fortresses in order to protect villagers, after that, bandits were all afraid to approach, and disputed with the fortress." Huanglian was the ancient name for Ninhua, and Luojun Wu was the creator of Huanglian county. The survey on Ninhua scholar and the descendants of Wu indicated that there were many Tubao around Huanglian county.

(2) Passive building This was another main reason for the production of Tubao in Ming and Qing Dynasty. Numerous turbulences occurred since Ming and Qing Dynasty. From thirteen years in the Ming Hidemune formal closure (1448) to the Jiajing time of Ming Dynasty, and to the end of the Qing Dynasty, the social was turbulent, and bandits curtsied across the country, people were all plunged into a misery. Situations that roads with no people walking on, houses with no people living in, and fields with no people faming appeared in lots of villages, thus Tubao were constructed in places of Minzhong, such as the Ching Yuen building in Dataokou village of Yongan city. It was destroyed in 1859, but rebuilt with a fortress wall in 1863.

(3) Self-defense for rich Larger scale, structural sophistication, numerous houses and exquisite decorations were the properties of this kind of fortress. For example, three Tubao on Fenggang street in Suimei village of Sha county were constructed during the years of Qing Tao-kuang, the creators were three brothers of Shunzhi Zhang. The Zhang family migrated from Anxi county to Sha county, living with planting and tea processing, and also acquisitions of tea from farmers around and then selling the tea to Fuzhou, etc. After the hard-working for many generations, they became rich gradually, and constructed three Tubao named "Shuang Ji", "Shuang Xing", and "Shuang Yuan" respectively in order to live a happy life and prevent the invading of bandits.

(4) Forces concentrated self-defense This kind of Tubao always were built with small scale, and creators paid much more attention on practical use than decorations. For example, Tai An fortress in Xiaohua village of Taihua town of Datian county was the family-hold type, constructed by Lin family and their clan relatives in late Ming and early Qing Dynasty, and transformation of the expansion project were done in Qing Xianfeng eight years (1858); Zhen Zhong fortress in Quechen village of Taihua town of Datian county was built by different families including families Lian, Chen, Fang, Lu, Wei, Lin, etc., in Qing Shunzhi seven years (1650). Stars Gathered building in Shangyan village of Wulin town of Datian county was built in Qing Xianfeng years, according to the legend, this Tubao was self-built by villager whose name was Zhanyao Yang, but was left unfinished because of the lack of money, thereafter, he combined six families in the village to complete the building, therefore, this Tubao was named "Stars gathered building", with alternative name as "seven stars building".

3 TYPES OF FUJIAN TUBAO

3.1 Classified by Functions

In terms of Tubao function, it could be divided into defensive fortress and fortress-residential fortress. Vast majority of Tubao were constructed mainly for defenses, the constructed philosophy strongly emphasized on security, especially for the composition of the defensive facilities. The representatives of this kind of fortresses are She Bei fortress in Ninhua, An Zhen fortress in Yongan, Tang Chen fortress in Datian, Lotus stockade village in Youxi. Fewer Tubao were built mainly for living, supplemented by defenses. There are two kinds of this type fortress, one is the addition of residential towers type turret to the suitable places of the original central room; the other is that combining the residential towers type turret with the newly built central room. Guang Yu fortress and Shao Hui fortress in Datian, Guang Yu fortress in Youxi, Song Qing fortress in Sanyuan, etc., are the representatives of this kind of fortress. In addition, there are also rare dividing fortresses mainly for living, for example, Da Fu Zhen fortress in Youxi is this kind of fortress, and there are three residential towers type turrets built in front and behind the main building.

3.2 Classified by Shapes

Classified by shapes, it could be divided into square, square in front and round in back, round, and irregular fortress. The number for the square (including rectangle) shape fortresses are the most, accounted for 50 % of the total numbers of Tubao, the representatives are She Bei fortress in Ninhua, Yong Shen and Yong Shi building in Yongan, Feng Yang fortress, Bu Yun building and Tai An fortress in Datian, Lotus stockade village in Youxi, etc. And there are more fortresses that are square in front and round in the back shape, like An Liang fortress in Datian, Shuang Yuan fortress in Sha county, Song Qing fortress in Sanyuan, Mao An fortress in Meilie, etc. Some of these type of fortresses do not have residential towers type turrets, some of them include circle rooms. The round shape fortress is rare, such as Tang Chen fortress in Datian, Yun Sheng building in Yongan. The irregular shape fortresses mainly take Kan Hou fortress in Jiangle, Yi An and Hui Qing fortresses in Yongan, Lute fortress in Datian for examples.

3.3 Classified by Site Selection

Based on selected sites, it could be divided into high mountains fortress, hillside land fortress and the field fortress. The high mountain fortresses always been built on the higher elevation, took the cliffs as the natural protective screen, such as Lute and An Liang fortresses in Datian, Ju Kui fortress in Youxi. Hillside land fortresses were built on the hillside not far from the village, they were designed side by side, and are the most representative fortress, like Shao Hui fortress in Datian, Mao Jing fortress in Youxi, An Zhen fortress in Yongan. Besides, the field fortresses were mostly built in the field or on the flat ground, water and mud were utilized to defense the enemies, such as Feng Yang fortress, Tang Chen fortress and Tai An fortress in Datian, Hui Qing fortress in Yongan.

3.4 Classified by Overall Arrangement

This classification could divide Tubao into palace type, hall type and courtyard-type fortresses. Most of the Tubao in Minzhong is courtyard arrangement, which is in accordance with the traditional residences. The palace type fortresses were mostly built in square type, the properties of this kind of fortresses are symmetrical and prioritize, like Shang Tubao in Qingliu. The hall type fortresses are like the oval type seen from the plane, there is a pool at the door, and the back of the fortress is like the semi-circle type, such as An Zhen fortress in Yongan and Fang Lian fortress in Datian. Also, there are some courtyard-type fortresses, the living spaces were layout around, and in the garth, there were the main halls, like Fu Lin and Yong Shi fortresses in Yongan, and Tai An fortress in Datian.

4 THE DISTRIBUTION OF FUJIAN TUBAO

Based on field researches and information, Tubao are mostly distributed in Fujian province, such as Datian, Youxi, Yongan, Sha county, Ninhua, Qingliu, Jiangle, Mingxi, Jianning, Taining, Meilie, Sanyuan in Sanming city; Yongchun, Dehua, Nanan, Anxi in Quanzhou city; Zhangping in Longyan city; Mingqing, Fuqing, Yongtai in Fuzhou city; Gutian in Ninde city. According to incomplete statistics, in the history, there were ten thousands of Tubao in Minzhong area, but nowadays, there remained only 500 fortresses, 150 of which were protected well, and only 40 fortresses with the original status and integrity protection, mainly centralized in Yongan, Datian, Youxi, Sanyuan and Meilie of Sanming city, and Zhangping in Longyan city, Dehua, Yongchun in Quanzhou city, and Yongtai, Mingqing in Fuzhou city.

The analysis of geographic environment, years of construction and technology revealed that Sanming was the centre of the ancient defensive constructions. The information provided by Xiaoyin Liu, Jianjun Li, et al. from the museum of Sanming were quoted to analyze the distribution and quantity of Tubao in Minzhong as follows (Liu, 2008; Li, 2010).

It was difficult to confirm how many Tubao emerged in Sanming since late Sui and early Tang Dynasty up to now. According to the local family tree, biography and fieldtrip, Tubao were found in all of the 12 counties in Sanming. The book "The records of Sha county" (1992) settled down that "after the middle period of Qing, Tubao were built in every village because of the turbulent society and lots of bandits." During Ming and Qing Dynasty, there existed about 600 fortresses in Sha county, suggesting that more than 500 fortresses remained after middle period of Qing Dynasty. The conditions in Ninhua, Qingliu, Mingxi, etc., were similar with Sha

county, and the numbers of fortresses in Yongan, Datian and Youxi were more than Sha county. Let alone that there were fortress communities in many villages of Sanming. For example, there were more than 3 fortresses in Yianxiang village of Ninhua county, Lindi village and Tianzhong village of Qingliu county, Fuzhuang village and Zhongluo village of Yongan city, Suimei village of Sha county, and Shujing village of Youxi; in addition, there were 4, 5 and 6 fortresses in Futang county, Quechen and Fengzhuang respectively in Datian; also, lots of fortresses lied in Da Tao Yang area of Yongan city, such as Zheng Yuan building, Yong Shen building, Yun Shen building, Yong Shi building, etc. Shibi, Quanshang, Huaitu, Fangtian in Ninhua county, Changxiao, Lijia, Lingdi, Dengjia in Qingliu county, Xiayang, Hangxi, Shaxi in Mingxi county, Xiyang, Hongtian, Xiaotao, Qingshui in Yongan county, Guangping, Taihua, Junxi in Datian county, Taixi, Zhongxian, Meixian in Youxi county, etc., were all of the famous Tubao communities. Some villages even named after the fortresses. Survey by Xiaoyin Liu revealed that lots of villages in Sanming were all named after the fortresses, showing the importance of the Tubao (Liu, 2008).

Tubao mostly centralized in Datian, Youxi and Yongan counties of Sanming. Tubao in Datian were of the most abundant (about 300 fortresses of intact, less integrity and the ruins), constructed earliest and the most abundant types. Datian Tubao were inscribed as the “important newly discoveries” of the third investigation of cultural heritage of the whole county in 2009. “Datian Tubao” consisted of seven fortresses which is An Lian fortress, Fang Lian fortress, Guang Yu fortress, Guagn Chong fortress, Lute fortress, Shao Hui fortress and Tai An fortress, were listed as the important heritage site in Fujian province. About 100 fortresses were remained in Youxi, the construction techniques and decorations were special, including the factors of Tulou and circle room. What’s more there were about 100 fortresses in Yongan, An Zhen fortress in Huainan village were of the largest scale, best protection and most exquisite decorations, it was enrolled as a national key cultural relics protection units in 2001.

5 THE DEVELOPMENT OF FUJIAN TUBAO

At present, there are two opinions on the origin of Tubao, one considered that Tubao was evolved from castle and fort, and the construction technology was brought from central plains in Jin Dynasty; the other regarded that ancestors of Sanming were able to use earth as the material for wall, Tubao was the native defensive constructions evolved from stockade villages. Although these two opinions remain dissension, Tubao was the product of the turbulent feudal society, in accordance with the conclusion that Tubao was generated in Sui and Tang Dynasty.

The earliest Tubao was constructed in Ninhua county. If the historical document about the construction built by Luojun Wu in the book “The record of Ninhua county” was correct, then the ages of Minzhong Tubao could be dated back to late Sui and early Tang Dynasty. The earliest Tubao in Ninhua were all square type with large scale, and could be lived by the whole family. However, there remain the differences between these fortresses and fortresses in Ming and Qing Dynasty; they were just the initial stage of Tubao in Minzhong.

At the end of Tang Dynasty, people from central plain became to immigrate to the south for second time. These immigrants gained the initiative, and the local people were afraid of them, fortresses were constructed mainly as the temporary places for escaping when attacked by bandits. Tubao were first developed in Song and Yuan Dynasty, they sprang up in other places of Sanming, and the defensive facilities were further completed.

In late Ming and early Qing Dynasty, Minzhong areas were always attacked by bandits owing to the dynasty substitution, government corruption and the social turbulence. There were lots of Tubao constructed in order to facilitate collective defenses. Tubao with abundant types and shapes began to appear at this time, such as the square in the front and round back type and irregular plane type (Dai, 2009).

With the better security of society, the defensive function of Tubao gradually became to fade, and Tubao turned from the defensive tool to living space as the primary function; and the defensive targets became the thieves and robbers rather than bandits. From the late Qing Dynasty to the republic of China, there were little differences between Tubao and general residential houses, the scale also became smaller.

6 SIMILARITIES AND DIFFERENCES OF FUJIAN TUBAO AND TULOU

Sanming Tubao in Fujian has the longest history, and their quantities are also at the most, therefore, we will focus on the similarities and differences between Sanming Tubao and Fujian Tulou.

Tubao and Tulou are not only similar in appearance, but also have great defensive functions. Both Tubao and Tulou have thick mud walls with gun holes, and only one door. There were water wells in courtyard and granary in the fortress for the long time living.

The main differences for Tubao and Tulou are as follows:

(1) Different construction time. Sanming Tubao appeared in Sui and Tang Dynasty, while Fujian Tulou in Song and Yuan Dynasty. The construction time for Tubao was earlier than Tulou.

(2) Different functional distribution. Tubao was constructed mainly for defenses, the outer lane was mainly for defenses, rarely lived with people, and the living spaces were inside the courtyard houses. On the contrary, Tulou were built mainly for living, people lived in the outer lane. The defensive function for Tubao was much greater than Tulou.

(3) Different flat layout. For Tubao, it's the combination of the outer lane building and inside courtyard houses; there were many different sizes and shapes of small courtyards. As to the Tulou, it's always monocyclic floor or polycyclic floors, living spaces were settled around the building, and there were spacious squares and courtyards.

(4) Different wall materials. The bottom of the wall of Tubao was masonry construction, and the rammed earth was used above the second floor, the wall was as thick as 2-6 meters. And for Tulou, the wall was built using mature soil, and the plinth was made of cobblestones, the wall was 1.5-3 meters thick, with properties of fastness, durable, and saving living spaces.

(5) Different stress system. The wall of the Tubao was not the major loaded body, the main building was the wooden structure, the load transferring system usually works as follows: from the green roof tiles → the board under the tiles → the wooden beam → the wooden poles, last to the base. For Tulou, the wall carried the loads, the circle rooms inside are wooden structures, which transfer loads to the wall. As per the studies by Tulou expert Hanmin Huang: "the appearance of Fujian Tubao was the same as Tulou, the outer wall was like the thick city wall, but the earth wall was separated from the wooden houses, the earth wall was not the loaded body, exactly like the saying 'houses did not collapse when the wall fell down'. Thus 'the earth wall subjected forces' make Fujian Tulou differ from Fujian Tubao."

7 CONCLUSIONS (PROPERTIES OF FUJIAN TUBAO)

7.1 Excellent Defensive Function

The main function of Tubao is defensive. Therefore, there are high and thick walls, spacious way for horse racing, turrets, wooden holes for gun, stone door of fortress, etc. And as to the site selection for Tubao, it was paid much more attention to the places that facilitated defenses. Some were built hillside, in the spacious field, or close to the river. If it was hard to utilize the terrain, then trenches were built around the fortress, to keep bandits away.

7.2 Utilizing Local Resources and Meeting Survival Needs

There are lots of mountains, forests and trees in Minzhong area, which provide abundant resources for the Tubao construction, since the main materials for Tubao are rammed earth, stone and wood. With reference to local natural environment and people's needs, Tubao builders completely developed their own talents and wisdom, and constructed the Tubao which were suitable for the local surviving and defenses, adapting styles compatible with their surroundings.

7.3 Peculiar and Practical Structure

Minzhong Tubao keeps the Chinese traditional architectural characters such as the axial symmetry, courtyard-houses combination, wooden bearing system, etc., and also takes good advantage of the local natural sources and construction conditions, emphasizing on the defensive function. In addition, the layout plans and architectural structures are unique, with strongly practical uses. Many Tubao were built closely to the hills and appeared to be distinct gradations architectural features, totally demonstrating the excellent technology of local skilled workers. The diversity of types, practical uses, defensive functions, and unique styles of Minzhong Tubao were particular and precious in China even around the world.

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