

Researches Based on the Inundation-Prevention Oriented Migrations of the Major city sites of Chengdu Plain in Pre-Qin Dynasty Period

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Abstract: In pre-Qin period, floods frequently raged the Chengdu plain. Therefore, the major city sites in the regional civilization center of Chengdu plain underwent repeated migrations. And during this, the ancient Shu people constantly acquired the flood prevention techniques and gradually attained the pursuit of “the harmony of Man and Nature”. Hoping to inspire the contemporary urban flood prevention, this thesis set about expounding the migration of the main city sites of Chengdu plain and the achievements in flood prevention techniques of the ancient Shu people in pre-Qin period through summarizing historical and archaeological data and analyzing environmental climatology evidence.

Key words: *Flood prevention; Chengdu plain; Pre-Qin Dynasty Period; City Sites;*

Chengdu plain is located in the upper reaches of Yangtze River Basin which is in the southwestern region of China; also, it held a pivotal position in regional political and economic development in history. Moreover, it has long been served as a significant basis for the facilitation of the unity and rejuvenation of the Chinese nation. However, Chengdu plain was not born “land of abundance” and “place of plentiful resources” where “inundation and droughts were under control and people suffered no hunger at all since then”. Conversely, there were numerous rivers in the plain which made it an overflowing land in which “When the river water first inundated, the Shu people almost led their life in water”. Consequently, its regional urbanization establishment and development experienced incessant process and multiple migrations.

1. Minjiang River Period

According the existing archaeological data, the infancy of ancient Shu civilization emerged around 5000 BC; and at that time, the ancient Shu people had established residential settlements of certain size in valley region of upper Minjiang River(with Yingpan Mountain sites in the center), represented by Shawudu sites and Posey sites. And this series of archaeological sites were all built near the loess tableland of the valley region of Minjiang River, instead of the river alluvial plain, and they have steered clear of Longmen Mountain fault zone as well. From the reasons above, we can deduce that, apart from farming and hunting, the ancient Shu people have had the initial calamity-avoiding

awareness.

In 3000-2000 BC or so, influenced by the “Little Ice Age”, the climate in the valley region of Minjiang River has become extremely unstable, which shifted between drought and inundation swiftly¹. On the one hand, the precipitation reduced considerably; and severe droughts and inundation emerged on the other. As a result, led by King Can Cong, the ancient Shu people emigrated from the valley region of Minjiang River to Chengdu plain gradually.

In the proximity of 2500 BC, the six ancient cities of early Baodun culture (Xinjin Baodun ancient city; Gaoshan ancient city and Yandian ancient city in Dayi; Zizhu ancient city and Shuanghe ancient city in Chongzhou and Mangcheng ancient city in Dujiangyan) distributed along the Minjiang River have become the civilization center, but the frequent inundation compelled ancient Shu people to abandon these cities soon afterward. Owing to this, the ancient Shu people migrated from the west end to the southwestern central region of Chengdu plain around 2000 BC.

The six ancient cities of Baodun culture was all constructed near the river tableland and the long sides of the city walls are often consistent with the fluvial trend; the plane the cities were slightly rectangular or squarish and their cross-sections were trapezoidal. All the city walls were constructed in the form of slope rather than the popular vertical walls². Besides, both sides of the ancient city walls were slopes which were about 30° - 40°, according to the measurements of the rammed earth surface, and the outer slope was less steep than the inner one. For these reasons, this sort of city wall can hardly defense any military attack². In addition, the accumulations at the bottom of city walls were quite distinct from each other. A large amount of pottery shard exited at the inner city wall, which were attributed to human activities, whereas the bottom of outer city wall were abundant in sludge and sandy soil that were associated with river flow³. Therefore, we speculate that the main function of the city walls at that time was to protect the cities from inundation. And also, the ancient Shu people have had the initial calamity-avoiding awareness.

2. Tributary Period

After the migrations, the ancient Shu people constructed two cities (Yufu ancient city in Wenjiang and Pixian county ancient-city village) of late Baodun culture in the neighborhood of Jianjiang River, an embranchment of Minjiang River.

In the proximity of 1700 BC, another climate upheaval occurred in Chengdu plain triggered serious inundation which destroyed the ancient cities of late Baodun culture. As a result, the ancient Shu people migrated eastward to Sanxingdui ancient city in the neighborhood of Luoshui River, an embranchment of Minjiang River. The Sanxingdui sites were quite special in that it had two rivers, the Yazhi River and the Muma River, at the north end and across the city respectively. Therefore, its uniqueness and scale (3.5 square kilometers) made it the ace in the same period⁴. What is more, the special city sites enabled hundreds of years of consecutive development of Sanxingdui ancient city, which, on the one hand, indicated that the climate in that period was comparatively stable; and showed that the ancients Shu people have had some basic inundation prevention and regulation techniques on the other.

Around 1200 BC, most regions in China witnessed a drastic temperature decrease, and that was in the first cold period in Western Zhou era⁵. As an essential part of China, Chengdu region inevitably entered the cataclysmic climate change period, featuring continuous coldness and drought and extemporaneous inundation⁶. And this was best exemplified by the ancient legend of “King Tang sacrificed Himself to God at Sanglin”, which was coeval to late Sanxingdui culture. Detailedly speaking, it was documented in Conform to the Will of the People (A chapter of Lv’s commentaries of History) that “King Tang conquered Xia Dynasty and united the nation. But after that, a drought occurred which led to a five-year crop failure, therefore, for his people’s sake, King Tang sacrificed himself to God at Sanglin⁷”.

The same situation went on for over two centuries, and the frequently-occurred inundation almost brought destruction to Sanxingdui ancient city, and the sites were abandoned soon afterwards⁸. Therefore, we can conclude that the limited inundation prevention knowledge that ancient Shu people mastered was unable to defense frequent deluges

in that period.

Simultaneously, Du Yu superseded King Yu Fu and became the new leader of the ancient Shu region, after which he established Jinsha city the region's capital. Around 800 BC, accompanied with severe floods, the climate in ancient Shu region fluctuated violently; and at that period, the inundation prevention related measures were clearly documented for the first time. For instance, as it was written in Yangtze River (a chapter of The Commentaries on Classic Waterways) that "The Yangtze River continued to surge to the east and flowed through the Wu Gorge, which was chiseled under the order of King Du Yu to dredge the Yangtze River⁹". Similarly, the descriptions about Du Yu's regulation on Puze appeared in The Appendices and Notes on Guanjiang River, too. Besides, the remains of small water conservancy facilities were discovered at the Modi river which was located at the north region of Jinsha ancient city. Evidently, these documents have not only indicated that the catastrophe prevention awareness of the ancient Shu people was reaching maturity but also revealed the significant progress of disaster prevention techniques at that time: applying hydraulic engineering programming such as the chiseling of the Jichuan River in the inundation prevention and regulation process actively.

3. Inland period

Due to the extreme climate instability and unprecedented ferocious inundation, although the catastrophe prevention techniques improved markedly in King Can Cong and King Bo Guan period, the Jinsha ancient city still suffered severe destruction which gradually led to the fall of the city.

In the proximity of 600 BC, Chengdu plain was inundated by a vast deluge which was relevant to the ultimate abolishment of Jinsha ancient city. However, the ancient Shu people, led by Bie Ling (the prime minister of King Du Yu), harnessed the inundation successfully. And after that, Bie Ling made himself the King of Shu. Therefore, "the enlightened dynasty" was established. Apart from that, the two major activities in Bie Ling's inundation process were, namely, "chiseling Yulei Mountain to eliminate the floods and digging the watercourses in Guanghan and Jintang¹⁰". As Xu Shen who lived in East Han Dynasty pointed out in his book Shuo Wen that the technique that Bie Ling adopted (chiseling Yulei mountain to eliminate the floods) was no ordinary dredging but burst, which was to lead floods to flow from high to low) down-flowing. Therefore, the inundation prevention and regulation techniques in Enlightened Dynasty were fairly mature, which essentially eliminated the inundation in Chengdu and Pixian County.¹¹

However, the three-hundred-year rule of the "Enlightened Dynasty" was not ended until the Qin Dynasty conquered the Shu Dynasty in 316 BC. Owing to this, the ancient Shu civilization suffered a sudden halt and was integrated to the central region politically.

In 311 BC, the Qin authorities dispatched Zhang Yi and Sima Cuo to the Shu region, with the aim of planning the Shu County and governing it. And the county capital they chose was precisely the capital of the "Enlightened Dynasty". According to The Huayang National Annals-Shu Annals, Zhang Yi planned to fill the huge pits outside the city from which the soil was dug out to build the city with water and made them artificial lakes. There were artificial lakes all around Chengdu, "Qianqiu lake on the east, Liuchi lake on the west, Tianjing lake on the northwest; all the lakes shared confluences and was inexhaustible all year long¹⁰". And he intended to cultivate a situation in which city was commensurate with the water.¹²

After Zhan Yi's fortification, by making full use of the watercourses and natural terrain, the governor of the Shu County, Li Bing, presided over the construction of the globally-known Dujiangyan hydraulic engineering programme, which eliminated the inundation in Chengdu plain radically. Since then, Chengdu was made "the land of abundance" where "droughts and inundation were under control" by the Dujiangyan hydraulic engineering programming; and that was known home and abroad. This was also a sign that the ancient Shu people have adapted themselves to the nature and applied the philosophy of "Tao models itself after nature" and "the harmony of Man and Nature" to the

harmonizing process with the nature.

4. Conclusion

During the thousands years' development of Chinese ancient cities, a complete set of strategies was established to control floods, including "prevention, dredge, impoundment, selection of city sites on high platform, solid building and change of river channel. Typically¹³", Chengdu is a successful example of ancient cities that utilized and controlled rivers. After tough and arduous explorations and development, the ancient Shu people migrated from the valley region of Minjiang River to the Chengdu plain and made it the economic, political and cultural center (Fig. 1). And after many years, the city sites of Chengdu remained what it were and underwent no change at all. And in this lengthy process, the safety awareness in choosing residential sites grew increasingly stronger. And apart from that, the inundation prevention techniques shifted from thickening city walls, ramming watercourses, dredging to the hydraulic engineering that Zhang Yi and Li Bing adopted were all the essence of ancient science and technology. Here is the point: it is futile to avoid natural catastrophe; on the contrary, it is learning to adapt to and harmonize with nature that really count, not to reduce and avoid calamity.

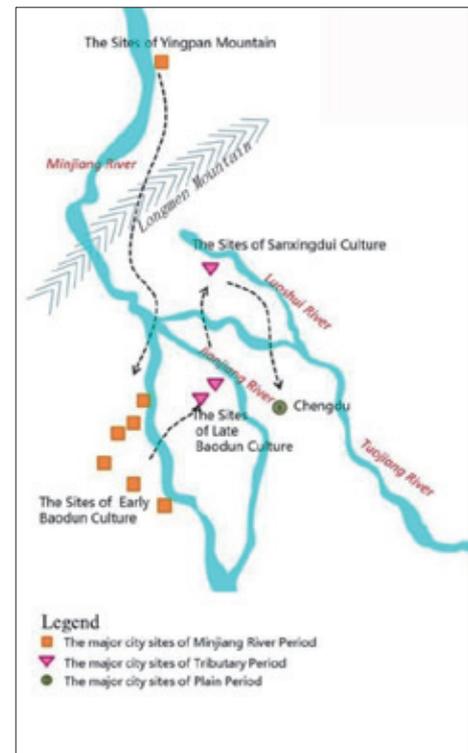


Fig1 The Diagram of the Migrations of the Major City Sites

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