

The Analysis of the Liangzhu Culture Based on Jade Artifacts and Architecture

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Abstract: The Liangzhu culture was mainly distributed in the Taihu Lake basin and was one of China's important civilizations of the Neolithic Age. Its core area is in the ancient city of Liangzhu in Pingyao Township, Yuhang District, Hangzhou City, Zhejiang Province. With the archaeological excavations of the Liangzhu culture, there have been many speculations about the social structure of the Liangzhu culture. Previous research generally believed that the Liangzhu culture was an alliance of villages within a particular area and that the ruling class in the political center did not have excessive control over other village owners. This article will further explore the possible social structure based on past research on the social structure of the Liangzhu culture. By studying the villages and water conservancy facilities within the Liangzhu culture, this article argues that a power core may have dominated the culture, and its ruling class had specific resource control and administrative rights over the villages within its jurisdiction.

Keywords: Liangzhu Culture, Social Structure, Jade Artifacts, Hierarchy

1. Introduction

The primary purpose of this article is to speculate on the possible social system structure of the Liangzhu culture by studying its well-preserved buildings, jade artifacts, and transportation facilities. Previous studies on the social system of the Liangzhu culture have focused on independent discussions of individual aspects, such as the significance of the evolution of animal patterns, the transportation methods of jade materials, and the mobilization of labour for large-scale civil engineering projects. This article hopes to integrate existing research results on the social structure of the Liangzhu culture in order to speculate on its possible social structure and looks forward to more related research in the future to deepen this topic.

2. Introduction to Liangzhu Culture

The Liangzhu culture was mainly distributed in the Taihu Lake basin and was one of China's important civilizations of the Neolithic Age. Its core area is in the ancient city of Liangzhu in Pingyao Township, Yuhang District, Hangzhou City, Zhejiang Province. Archaeological research shows that the Liangzhu culture built several large-scale water conservancy projects in the Taihu Lake basin, which not only reflects its highly developed civil engineering technology but also reflects the ability of its ruling class to organize the deployment of labour across regions.

3. Liangzhu Culture Construction

For a civilization and a country, constructing buildings can show the country's ability to allocate social resources. Through the way it allocates social resources, we can further understand what stage the country and civilization are in. In addition, the different types of buildings can also show the focus of the civilization. For example, there are many large-scale water conservancy projects near the ancient city of Liangzhu, many of which exist as reservoirs. This means that the ancient Liangzhu City often suffered from rainy seasons, and the large-scale construction of large-scale water storage facilities shows that the ancient Liangzhu City could mobilize workers from settlements outside of its city. It is even possible that during the perennial process of water conservancy construction, some tribes were derived that relied solely on Liangzhu City and surrounding settlements as their primary funding source. This can be seen from the fact that some Liangzhu culture settlements did not have cultivated land.

3.1. Source of Nephrite Raw Materials

There are two main points in the distribution of jade artifacts that reflect the differences between the upper classes in the Liangzhu culture, who were able to own jade artifacts, on the one hand, the selection of the raw material nephrite, and on the other hand, the patterns engraved on the jade artifacts and the shape of the jade artifacts. In past Liangzhu excavations, jade artifacts were found in the royal tombs of the ancient city of Liangzhu and in the city-level ruins, which were slightly smaller than the ancient city of Liangzhu.

The vast majority of nephrite raw materials used in the Liangzhu ancient city are Xiaomeiling nephrite [1]. Xiaomeiling is more than 100 kilometres away from the Liangzhu ancient city, and such a long distance inevitably makes the transportation of Xiaomeiling nephrite to Liangzhu ancient city required much workforce to ensure the success of the transportation, and human resources were at all times a precious resource to ensure the survival of civilization. Nephrite jade, which required a large workforce to transport, became a luxury resource with expensive attributes. Furthermore, based on the excavation of the tombs in Liangzhu ancient city, jade cong-shaped tubes (see Figure 1) with mythical beast patterns, and other jade artifacts with religious connotations, all testify to the special nature and scarcity of jade artifacts in the Liangzhu culture [2].



Figure 1: Jade cong-shaped tube

3.2. The Use of Jade in Sacrifices

Research on the Liangzhu cemetery at Sidun found signs of jade being burned as funerary objects in the Liangzhu culture. This behaviour was to burn jade in the open air through fire for sacrifice. This behaviour is called burnt jade sacrifices [3]. Usually, these jades that have been sacrificed are buried

with noblemen of noble status during their lifetimes. Take the No. 3 tomb of the Liangzhu-period tombs at Sidun as an example. Its burial goods also include axes, maces and dubs. The fact that these items were unearthed simultaneously indicates that the tomb owner also owned wooden canes. These burial goods imply that the tomb owner had military power and was probably a royal family member [3]. Further analysis of these jade items revealed that the ritual burning of jade caused the signs of whitening and the fragmentation of some jade objects as burial goods [3]. All of this evidence proves that in the Liangzhu period, jade had both ritual and military functions in society, and the royal family probably held both.

3.3. The Complexity of Liangzhu Culture's Construction

The complexity of Liangzhu culture's construction lies in two aspects: the use of multiple teams and multiple different techniques and a powerful central dispatching system. Within the ancient city of Liangzhu are multiple artificially built platforms, burial grounds, large storage rooms, and other buildings. In addition, there are multiple water conservancy facilities inside and outside the Liangzhu ancient city, as well as at least 51 artificial and natural rivers and ditches to meet the Liangzhu people's transportation needs [4]. The construction of so many large-scale facilities inevitably required the control of large-scale construction sites and the ability to mobilize personnel and solve problems such as the mutual assistance of different personnel. According to calculations, the area of Liangzhu City and its surroundings required construction, Liangzhu City's 290 hectares are expected to require the removal of approximately 2.28 million cubic meters of earth and an additional 2.88 million cubic meters of excavated earth for the construction of water conservancy facilities embankments, low dams and high dams [4]. This shows the vast workforce required to build water conservancy facilities in and around Liangzhu Ancient City.

Two aspects of the building structure constructed by the Liangzhu culture can confirm the existence of a unified central control system in the Liangzhu culture in the past: one is the technology used in construction, and the other is the selection of stone materials. Take the foundation layer of the mound at Mojiao Mountain as an example. In addition to the gray clay deposits mined from the wetland near the construction site, the bricks used to build the foundation layer also used clay from the yellow geology of natural hills and mountains, most of which were used to build walls and dams, which shows that when building the building, Liangzhu consciously classified the clay collected in different geological environments according to their functions, and chose clay blocks from different regions according to the construction standards [5]. In addition, it also represents that during the construction, the Liangzhu people would send another team to go to the designated area to mine and make clay blocks for use, or it may be that the soil excavated during construction at other sites was transported to the construction site that needed this soil through the developed river channels. Either possibility represents that the Liangzhu culture had a good understanding of the geological differences between different regions and a developed river transportation system and messaging system. In addition to using clay ladders made of clay from multiple regions, there are also different discoveries in the stacking of soil blocks. Similar or different stacking methods are used between different layers [5]. This means that the ruling class of Liangzhu could cultivate multiple teams that controlled different construction techniques or hire teams of construction workers from other regions to come to Liangzhu to assist in construction. According to the fact that there were no conditions for growing food in cities smaller than Liangzhu, but the economic conditions were still so good that some people could afford to bury jade with them, it is speculated that in addition to the handicraft areas cultivated in the inner city area of Liangzhu, there were also clans in the surrounding areas that relied on handicrafts for survival. These construction workers with different skills may have been hired or conscripted by the ruling class in Liangzhu City from nearby settlements to fill the lack of labor in the construction team. The buildings in and around Liangzhu Ancient City were constructed using

multiple techniques, such as mud-brick construction, rammed earth, stone paving and woodworking. According to calculations, it would have taken 10,000 people 7–8 years to complete the entire Liangzhu Ancient City alone. However, the city was not built in one go; it was built through sporadic construction over at least several hundred years. The organization of labor during such a lengthy construction process was very complicated, which undoubtedly means that in addition to having a deployment system from different regions [5]. Liangzhu Ancient City should also have a dedicated, responsible agency to store construction information for a long time so that those who follow can understand the carrying capacity of previously established areas and other engineering information.

Some of the choices regarding labour allocation can be glimpsed in the stone paving techniques used in the construction. In terms of the selection of stone materials, the small mining teams in Liangzhu tended to obtain the stones of the required size directly from the source rather than carrying out large-scale formal mining and excavation [6]. These stone mining workers were usually equipped with only a few tools, but this was based on their knowledge of the location of the required distribution of the required stone. Understanding the geological environment allows these workers to collect the required stone without spending too much time and effort. Transportation to the designated construction site also involves the coordinated work of different teams, such as the team responsible for allocating the extracted stone, the team responsible for transporting and loading and unloading on the construction site, and so on. In short, the whole process of stone extraction shows that the workers at Liangzhu tended to divide the work into small groups and took time-saving measures when unnecessary. After transporting the stones to the destination, multiple groups worked together, which shows that the workers in Liangzhu culture tended to work in groups. This way of working means that there must be a central organization responsible for coordinating multiple workgroups to produce consistent construction results throughout the construction of the city wall.

4. Conclusion

This paper mainly explores the possible social structure based on past research on the social structure of the Liangzhu culture. From the source of nephrite jade and the organizational structure of large-scale water conservancy projects, the Liangzhu culture already had the experience and ability to organize large-scale labor at that time. However, based on signs that the Liangzhu culture may have hired teams of construction workers from other regions to assist with construction, this may indicate that its own labor force was not sufficient, but it had enough wealth to hire. This means that the Liangzhu culture may have been an economy that relied on trade or was export-oriented rather than a feudal-era state that had absolute control over the population and resources within its territory. Therefore, it can be speculated that the Liangzhu culture was likely a loose alliance system, and the hired construction teams may have come from other clans within the alliance, while the Liangzhu ancient city represented the power of the most developed clan in the alliance.

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