

## Preface

How long should the history of the development of world civilization be? This is a very controversial issue. Some views hold that the history of the development of world civilization is about 7,000 years, which began in Mesopotamia and ancient Egypt. Of course, this date is determined mainly through archaeological finds and some written records from the Middle Ages. But much of the evidence is not very solid. In the past, many people in China have always thought that their civilization history is only 5,000 years old, because the written records can only go back to 5,000 years. However, with the development of modern archaeological technology, more and more ancient civilization sites have been excavated, and people have found that the history of human civilization is far longer than we used to think of 5,000 years or even seven or eight thousand years. The main evidence for some to believe that Mesopotamia and ancient Egypt are the origins of human civilization is that these two ancient civilizations may have possessed writing. Therefore, although the rock paintings in the caves with an earlier history of more than 10,000 years are not called human civilizations. Of course, this is worth discussing.

We think it would be too superficial to limit the signs of the origin of human civilization to writing. The origin of human civilization is more important than that there must be some very important technical signs. In other words, if there is a technology that can significantly extend the life span of human beings, reduce infant mortality and improve the quality of human life, it can be considered that the historical development of human beings has entered the stage of civilization. This civilization, marked by the advent of specific technologies, has more continuity. After all, these technologies have always been used in human society and have been passed down from generation to generation. On the contrary, those civilizations that had writing, such as the ancient Egyptian script and possibly the more ancient cuneiform script, were used for only a period of time, and then completely disappeared into the long river of human history for a long time, until one year was excavated by archaeology. It can be seen that these ancient writing words seem to have contributed very little to the development of human civilization. This shows that the appearance of writing is not a necessary condition for the continuation of human civilization as a whole.

The civilization I want to talk about in this book, I call it “Liangzhu Civilization”. This is a human civilization that dates back 20,000 years. An important symbol of this is the invention of the clay pot. On the one hand, the advent of clay pots meant that food was

no longer eaten raw or roasted over fire. Humans can also cook food in this way by boiling it. The advantage of boiling is that it can cook all kinds of tough plant fibers and hard-to-chew meats. This is very important for infants and the elderly. As a result, the invention of clay pots significantly reduced infant mortality and extended the life expectancy of the elderly. Of course, for young adults, boiling at high temperature also kills a lot of harmful bacteria, thereby reducing the incidence of diseases among young adults and improving the quality of labor in the whole society. On the other hand, most of the civilization sites that have been excavated contain clay pots, which prove the important position of clay pots in the history of human civilization.

With the important clue of the clay pot, it means that we have obtained the golden key to open the door to the history of the development of human civilization, and let us have a clearer image of the path of human scientific and technological development. From the appearance of the earliest clay pots to the domestication of rice, the problem of how human beings can eat their full stomachs has been solved. Then to the invention of textile and clothing, it effectively solves the problem of human cold. Then to the mass production of canoes, which solved the obstacles encountered by humans to freedom of navigation on the water. After improving the canoe, humans made more efficient plank boats, and then invented the Fu ship that could sail long distances in the ocean. Sailing the vast seas requires very precise navigation techniques, one of the most important of which is astronomical observation. In tens of thousands of years of human astronomical observation, human beings began to construct their own cosmology, and reached a peak in the Song Dynasty. In the Song Dynasty, the ancient Chinese had been able to determine the positions of more than 1,400 stars and galaxies, and discovered the elliptical motion laws of the planets, which laid a solid foundation for Kepler's three important laws of planetary motion, and also provided important evidence for Newton's law of universal gravitation. It is no wonder that Newton would say that his achievements stood on the shoulders of a giant. The giant that Newton mentioned is actually the scientific and technological achievements formed by human beings after inventing the first clay pot more than 20,000 years ago.

Strictly speaking, this book is not a simple history book, but a philosophical, sociological book, hopes to explore some fundamental questions about the existence of modern human beings by reflecting on the history of human civilization and the history of scientific and technological development for 20,000 years. These questions include, but are not limited to: How has our technology evolved now? What is the impact of global climate change on human society? Is the invention of weapons of mass destruction an inevitable development of human science and technology? Is war the

driving force for the development of human civilization? and etc. By reading this book, I am sure that the reader will draw the corresponding conclusions for himself.

Finally, unlike other similar monographs, the author of this book is a physicist, so he is more adept at tracing clues such as the development of science and technology than the changes in human art and mental state. It also provides readers with a new perspective on the development of human civilization.

The book is divided into seven chapters. The first chapter introduces a general description of the Liangzhu culture, which can give the reader a general concept of the Liangzhu civilization. The second chapter analyzes the origins of the Liangzhu culture. For example, the impact that climate change may have on human society. Because most of the current resources related to the ancient Liangzhu civilization are obtained through archaeological excavations, it is necessary to use the knowledge of social thermodynamics to explore the relationship between human society and changes in the natural environment. For example, there are differences between the ancient Yangtze River and the current Yangtze River, which led to the development of the Liangzhu civilization from the Shangrao area in the northeast of Jiangxi in the west, to the Jinhua area of modern Zhejiang, and then to Hangzhou Bay, and finally formed the ancient city of Liangzhu in its heyday. In this chapter, the Shangshan culture, the Hemudu culture, the Kuahuqiao, the Majiabang and Songze cultures, and some cultural developments before the heyday of the Liangzhu civilization are introduced. The third chapter focuses on the development of the ancient city of Liangzhu. It is pointed out that due to the development of productive forces, the urbanization path of Liangzhu civilization is inevitable. The urbanization of the Liangzhu civilization also means the formation of more and more complex industrial chains. These industrial chains are supported by the well-established service industry provided in the ancient city of Liangzhu, including advanced means of transportation, a variety of clothing, food, housing and transportation services and so on. In this chapter, the cause of the destruction of the ancient city of Liangzhu is also analyzed, and the cause of the destruction of the ancient city of Liangzhu was a huge flood. The Flood is supported by a very rich body of geoarchaeological and historical evidence.

Chapter 4 introduces another very prosperous Sanxingdui culture formed after the migration of the Liangzhu civilization to the upper reaches of the Yangtze River. In this chapter, strong evidence is given to support that the Sanxingdui culture is a continuation of the Liangzhu culture. And the reason for the disappearance of Sanxingdui culture is given. Chapter 5 describes the spread of the Liangzhu culture to other regions. Including the influence on the culture of the Central Plains of China, the influence on

Japan, the Pearl River Delta region, Southeast Asia, the Americas, etc.

Chapter 6 introduces the Renaissance of the Liangzhu civilization in the Song Dynasty. Through the comparison of this chapter, we can also get the grand occasion of the ancient city of Liangzhu. This chapter also leads to an important conclusion of the monograph, that human technology began to be misused after the rise of the Mongolia Empire. Chapter 7 introduces the inheritance of Liangzhu culture in China. Including some well-known persons who emerged in the Liangzhu Cultural in Chinese history, the revolutionary history produced in the Liangzhu Cultural, and the Liangzhu cuisine in the Liangzhu Cultural. I believe that such an introduction can give readers a more intuitive understanding of the cultural heritage of Liangzhu.

This book is mainly introduced in the form of words. However, the Liangzhu civilization is a civilization that is mainly inherited by means of symbols, graphics and sculptures, so the content of it must involve a lot of image information. Fortunately, the Internet is developing very fast, and these graphics and images can be directly searched and viewed on the Internet. Therefore, this book provides links to carefully selected online resources for some important Liangzhu cultural relics, and these links belong to some more authoritative museums and academic institutions, so the timeliness of the links will be relatively long. Even if it fails, it can be searched through a search engine. I believe that this will help readers to gain a more intuitive experience in the process of reading and thinking.

Finally, it is a monograph on history, but unlike other historical works, this monograph depicts prehistoric history. There is hardly any written material to prove the existence of this history.

However, we can speculate on the process of the occurrence, development and decline of the entire prehistoric history through archaeological excavations, geoarchaeological and changes in the global climate. In order to maintain the integrity of the content, some of the contents of this book will have a certain speculative nature, in order to form a relatively complete evidence chain with the existing archaeological evidence. This is not perfect, but it allows us to read the full picture of an unknown prehistory in our time. So I think that's very meaningful.

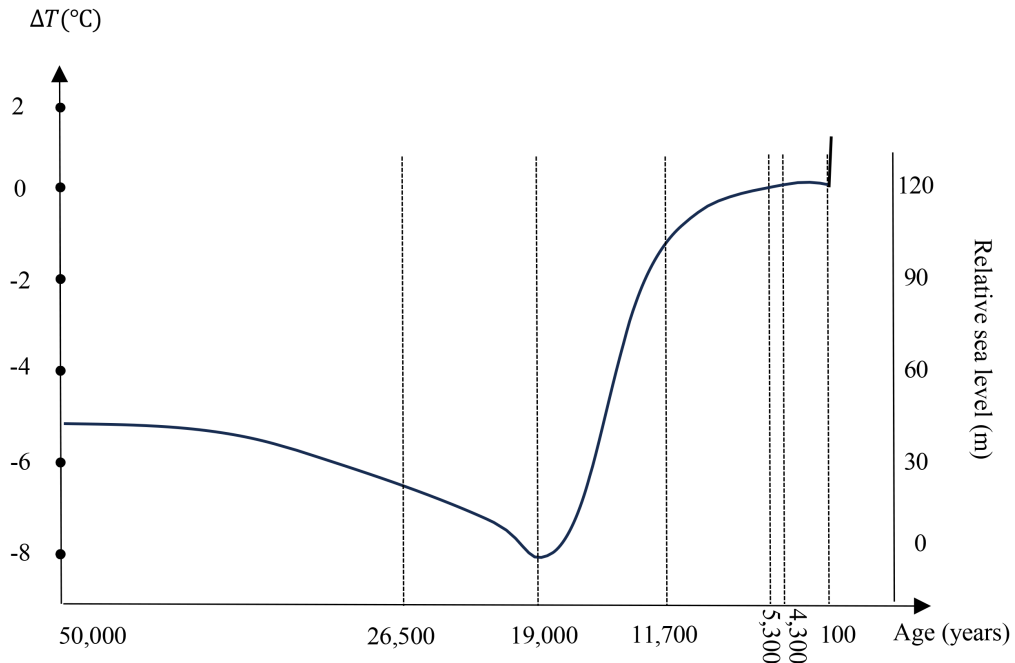
Zhi Cheng Oct. 1, 2024. Guangzhou, China

## Chronology of the Liangzhu civilization

**Tab. 1. Chronology of the Liangzhu civilization**

Age (years)	Signs of relics or dynasties
20,000	Xianrendong Cave site in Wannian, Jiangxi. The clay pot was invented. Wild rice began to become a staple food.
11,400	Shangshan culture in Jinhua, Zhejiang. Domestication of rice.
8,000	Hangzhou Kuahuqiao and Yuyao Hemudu culture in Zhejiang. Large-scale application of textile technology.
7000	Majiabang culture in Shanghai. The stone axe is used as an intermediary in the exchange of goods.
6,000	Songze, Hongshan and Lingjiatan culture. The function of jade as currency.
5,300	The culture of Liangzhu ancient city and Dawenkou culture. The emergence of a knowledge-based economy.
4,300	The ancient city of Liangzhu was submerged, Sanxingdui culture.
3000	Integrated into the culture of the Central Plains Shang dynasty
2000	The Baiyue countries, Qin, Chu, Han, Xiongnu, and so on. Luoxia Hong invented the armillary sphere.
1500	Three Kingdoms, Jin, Northern and Southern Dynasties, Sui Dynasty, Tang Dynasty etc.
1000	Northern and Southern Song Dynasty, Yuan Dynasty. Shen Kuo discovered the elliptical motion of planets.
500	Ming Dynasty, Qing Dynasty. Kepler published the laws of planetary motion, and Newton discovered Newton's laws of motion.
100	The Republic of China and the People's Republic of China.

## Global temperature and sea level changes over 50,000 years



**Fig. 1. Global temperature and sea level changes over 50,000 years**

The figure shows approximate trends in temperature and sea level between the ages of 50,000 and 100 years. Since there is a positive correlation between global temperature and sea level change, the same curve is used for changes in globe temperature and sea level. In general, changes in sea level fluctuate by a certain magnitude around changes in globe temperature. For accurate data, you can refer to the relevant papers (Osman, 2021) (Denton, Anderson & Putnam, et al. 2010). It is worth noting that in the nearly 100 years since the Industrial Revolution, the temperature has risen so fast that in the graph, the temperature rise appears almost a perpendicular line. However, due to a significant lag effect of glacier melting, the current sea level rise is about 0.2 meters (Frederikse, Landerer & Wu, et al. 2020). However, since the Industrial Revolution, the rise in sea levels has shown a clear acceleration trend.

### References

- [1] Denton, G. H., Anderson, R. F., Toggweiler, J. R., Edwards, R. L., Schaefer, J. M., & Putnam, A. E. (2010). The last glacial termination. *science*, 328(5986), 1652-1656.
- [2] Osman, M. (2021), Globally resolved surface temperatures since the Last Glacial

---

Maximum, Nature. DOI: 10.1038/s41586-021-03984-4.

<http://www.nature.com/articles/s41586-021-03984-4>

- [3] Frederikse, T., Landerer, F., Caron, L., Adhikari, S., Parkes, D., Humphrey, V. W., ... & Wu, Y. H. (2020). The causes of sea-level rise since 1900. *Nature*, 584(7821), 393-397.

## **The great invention of the Liangzhu civilization**

### **1. The invention of the clay pot**

The world's earliest clay pot was found in the site of the Xianrendong Cave in Shangrao Wannian County. The invention of clay pots meant that humans could not only process food directly by roasting it over fire, but also use clay pots to cook food. This is very beneficial for cooking cooked rice and porridge in the heating of foods such as raw rice. It is convenient for infants and the elderly, effectively reducing infant mortality and prolonging the life expectancy of the elderly. This is because boiling can also heat food more fully, so as to better kill germs and viruses in the food. As a result, the sanitary conditions of ancient humans in the Neolithic period were significantly improved.

### **2. Textile technology**

The main products include ordinary fabrics of plant fibers as well as silk. The evidence is a large number of textile tools unearthed from the Hemudu site, as well as black pottery carving patterns of mulberry silkworms.

### **3. Rice breeding and planting techniques**

The main evidence includes carbonized rice obtained from the Shangshan cultural site.

### **4. Canoe manufacturing technology**

Although the oldest canoe in the world that has been excavated so far is the Pesse canoe in the village of Pesse. However, the canoe excavated from the site of the Kuahuqiao is 5.6 meters long. In addition, a complete canoe-making factory and a model used to standardize canoe-making standards have also been unearthed in the Hemudu area.

### **5. Wind energy utilization technology**

The main evidence is the bamboo weaving on the canoe excavated from the site of Kuahuqiao.

### **6. Anti-counterfeiting technology**

The emergence of anti-counterfeiting technology means that the ancient Liangzhu civilization already had the concept of intellectual property protection. This is an important sign that human beings are beginning to value mental work.

---

## **7. Housing construction techniques**

Some revolutionary tools and techniques appeared, such as the invention of a kind of stepped stone adze and the mortise and tenon structure that connected the woods.

## **8. Paint**

These paints can be used to protect wooden furniture and buildings, and have the effect of anti-corrosion and moth-proofing. Applying paint to the canoe can extend the life of the canoe in the river.