The Origin and Declines of Capitalism

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Abstract

This book applies the fundamental principles of Marx's *Das Kapital* integrating perspectives from nonlinear science and social thermodynamics to systematically analyze the forms of capitalist society that have repeatedly emerged in human history. It thoroughly summarizes the inherent laws evident in the emergence, development, and eventual decline of capitalism. With both theoretical depth and an interdisciplinary perspective, this book is suitable for scholars and students in the fields of sociology, history, and physics, as well as readers interested in related topics.

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Preface

Since the official publication of Marx's *Das Kapital* in 1867, the entire international community has undergone great changes. Both in the theoretical and practical fields of science and technology, rapid development has been achieved. Among them, thermodynamic knowledge has ushered in an extremely important theoretical breakthrough after the 20th century, from the early linear thermodynamic theory to the direction of nonlinear thermodynamic theory. In addition, the development of theories such as relativity and quantum mechanics has allowed human beings to have a deeper understanding of the physical laws of the entire universe at the macroscopic level, and at the microscopic level, they have penetrated to the lowest levels, such as electrons, protons, and quarks. Therefore, the development of science and technology means that human beings have a new understanding and cognition of the laws of nature, and also provides a solid scientific theoretical foundation for the development of Marx's theory of Capital.

The impact of nonlinear thermodynamic theory on human society is quite significant. Classical sociological theories usually understand the development process of human society based on linear concepts, especially in Europe and other relatively short periods of historical development. The proposal of nonlinear thermodynamic theory, especially the birth of dissipative structure theory, means that the development of human society is no longer regarded as a linear process, but a nonlinear process. The nonlinear process shows that even if some social formations seem unsatisfactory, they can still show strong stability with sufficient energy input.

Nonlinear thermodynamics also means that some social states may be in a process of constant and repeated change, either from one state to another, and in turn, another state may return to a previous state. This non-linear development

process of human society may be truly closer to the current development of human society.

Another important phenomenon during this period of rapid change from the 20th to the 21st century was the emergence of a large number of new archaeological discoveries. New archaeological techniques allow people to more accurately determine the age of some historical events and cultural relics, providing an important archaeological basis for restoring the correct historical process. For example, after entering the 21st century, cultural sites such as the ancient city of Liangzhu excavated in the middle and lower reaches of the Yangtze River in China pushed the history of the development of human cultural civilization forward to 20,000 years ago. At the site of Xianrendong 20,000 years ago, the earliest clay pots in China and even the world were excavated, which fully proves that human industrial technology actually began to sprout 20,000 years ago. This means that the development of human civilization has lasted much longer than people realized in the 19th century. For such a long time, the concept of linear development held in the past may need to be supplemented and expanded in theory.

After entering the 21st century, there has been a more important technological breakthrough, that is, the development of the Internet and artificial intelligence technology. These developments in science and technology have made the exchanges between people around the world closer, and human beings can carry out various social activities almost completely beyond the limitations of time and space, including the Internet economy, which has flourished in the 21st century. This vigorous development also provides a technical guarantee for mankind to re-understand the development of capitalism under different technological conditions, and the resulting globalization also poses new challenges to the study of the development and changes of capitalism and other societies.

Of course, since Marx proposed *Das Kapital*, communist movements have been triggered all over the world, and socialist countries have been established in the Soviet Union and Eastern Europe. However, after entering the 90s of the

20th century, the whole of Eastern Europe and the Soviet Union underwent great changes, which also posed new challenges to the original capitalist and socialist theories. At present, China has made a series of new theoretical achievements, such as the theory of the primary stage of socialism, which are supplements and extensions of Marx's *Das Kapital* and are an important and powerful supplement to the development of Marxist theory.

After entering the 21st century, mankind is facing an unprecedented new problem. In the past, human activities generally had little impact on the natural environment, but after entering the industrial era, human industrial technology and activities have had a huge impact on the natural environment, including environmental pollution. At present, the most important change affecting the development of human society is global climate change. Due to the continuous release of greenhouse gases into the atmosphere by human activities after the Industrial Revolution, the global temperature has risen by more than 1°C compared to the early days of the Industrial Revolution. The impact of such temperature changes on humans is enormous, including rising sea levels and the emergence of various extreme weather. So, under the conditions of global climate change, this has become a new research direction and topic. It is also worth pondering whether the violent revolution model advocated in the past is still applicable under such conditions of global change.

Based on various nonlinear sciences accumulated by mankind since the 20th and 21st centuries and other latest archaeological achievements, this book proposes a nonlinear social development process. According to Marx's theory, human society should develop from primitive society to slave society, then to feudal society, then into capitalist society, finally into socialist society, and then to communist society, which is a linear process. However, it has only been more than 300 years since the French bourgeois revolution, and according to such a linear development process, it seems that human society can complete this process in one or two thousand years. But now we can see that after the emergence of clay pot technology, the development of human society has actually gone

through 20,000 years. For such a long time, if we follow the linear method, it is difficult to explain how human society has maintained such a linear process for 20,000 years. Therefore, this book proposes a nonlinear social development process, believing that different social systems are an alternating development process in the whole development process. A social system represents a state of society, and in thermodynamics, each social state undergoes a phase change to another when the conditions are right. At the same time, when the conditions are not met, it will also retreat from a relatively advanced state to a relatively backward state.

Therefore, this book mainly focuses on the capitalist social state of Liangzhu ancient city 5,000 years ago to the current modern capitalist social state, which lasted about 5,000 years. During these 5,000 years, this book studies that most stages of human society actually developed alternately in two states: feudal society and capitalist society. For example, when the capitalist society of the Shang Dynasty developed to its heyday, it was replaced by the Zhou Dynasty, and the Zhou Dynasty was a society that valued agriculture and suppressed commerce. By the Spring and Autumn and Warring States periods, due to the development of the productive forces of feudal society, which could not adapt to the production relations of feudal society, the central government of the Eastern Zhou Dynasty had completely lost control of the princely countries during the Warring States period. In the Han Dynasty, this capitalist factor broke out, and finally under the conditions of a unified national market, capitalism in the Han Dynasty flourished. Of course, in the process of continuous transformation between capitalism, socialism, and feudalism, the ways in which capitalism perished were actually diverse, including the society of Liangzhu ancient city affected by natural disasters, and the Song Dynasty, which was affected by external factors. This also fully reflects the non-linear characteristics of human society, which are elaborated in detail in this book.

The book is divided into 5 chapters. Chapter 1 briefly defines what capitalism is; Chapter 2 uses social thermodynamic theory to analyze the impact of energy

input and output on the development of the entire human society. Chapter 3 summarizes Marx's *Das Kapital* and provides a theoretical framework for the subsequent analysis of capitalist society. Chapter 4 specifically describes the development and demise of capitalism in China and the world since the time of Liangzhu Ancient City; Chapter 5 analyzes the development of capitalism under the current situation of global change and the new theory of a community with a shared future for mankind.

Chapter 2 of this book is a special chapter. This chapter can be read like a traditional book chapter, and in fact, with the development of artificial intelligence technology, it is also a chapter that can be used to perform calculations. Take advantage of the open access of this book, which means that if readers want to have a deeper understanding of the calculation method of social thermodynamics, they do not need to take out the scratch paper to calculate, but can directly input the content of this chapter into DeepSeek, and then ask DeepSeek corresponding questions, which can help us derive specific formulas and numerical calculations. Of course, in my experience, artificial intelligence programs such as DeepSeek may make some errors during specific calculations, so after each calculation, readers need to carefully check them, especially the errors in the calculations of scientific counting methods.

This book makes full use of artificial intelligence technologies such as large language models (LLMs) in the writing process, involving the language and word processing of this book, the calculation process of social thermodynamics, etc. This greatly improves the writing efficiency of this book. The author has also carefully verified the processed text and the calculation process, and is confident that the result is basically fine. Finally, the author is also convinced that AI technology does not contribute anything to the core ideas of the book.

Zhi Cheng
October 26, 2025. Guangzhou, China

Contents

Chapter 1. The Definition of Capitalism

The most well-known interpretation of capitalism can be found in Marx's *Das Kapital*. Marx put forward the concept of capitalism in contrast to socialism, aiming to highlight the differences between socialism and capitalism. The reason why socialism represents a more advanced social system can be understood by examining the various social problems caused by capitalism. Since capitalism was proposed as the preceding stage of socialist development, the term "capitalism" carries a certain derogatory connotation.

However, the concept of "capitalism" had been put forward by others long before Marx. For instance, Adam Smith's concept of capitalism is quite representative. He argued, "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest." (Jahan & Mahmud, 2015) In other words, Adam Smith believed that the core of capitalism lies in the pursuit of "their own interest". With the evolution of the times, the understanding of capitalism has also continued to develop. Currently, Merriam Webster defines capitalism as: "an economic system characterized by private or corporate ownership of capital goods, by investments that are determined by private decision, and by prices, production, and the distribution of goods that are determined mainly by competition in a free market" (Merriam Webster, 2025).

Marx held that capitalism mainly originated in the 14th and 15th centuries. During this period, early capitalists in the Mediterranean region began to employ free workers, marking the advent of capitalism. From the 16th to the 17th centuries, influenced by mercantilism, commercial capitalism in the Netherlands developed rapidly. After the 18th century, with the advent of the Industrial Revolution, industrial capitalism in places like Britain advanced at a fast pace (Li, 2012). Of course, many scholars hold different views on the origin of

capitalism; some even argue that capitalism emerged as early as in ancient Greece (Goldman, 2013). Regardless, up to the present day, people's understandings of capitalism still vary greatly. Different scholars have different interpretations, and individuals with different political stances also have their own ways of understanding capitalism. Nevertheless, due to the great influence of Marx's *Das Kapital*, on the whole, people hold a relatively negative view of capitalism, especially among the intellectual community (Nozick, 1998).

To understand capitalism and resolve the differences in various interpretations, we should analyze it from the perspective of energy cycles in nature and human society. Marx also emphasized the importance of the law of conservation of energy in his works. From the perspective of energy cycles in nature and human society, the most fundamental form is the sun's energy irradiating the Earth, which promotes the reproduction of various plants and animals. As the top species in the food chain, humans can rely on their wisdom and capabilities to obtain various foods from nature, which serve as the energy source for their growth and development. In the early stages of human society, the only way to obtain this energy was through the development of agriculture. During the Paleolithic Age, humans met their energy needs by hunting and gathering wild plants. Approximately 20,000 years ago, after humans invented important industrial technologies such as pottery making (Wu, Zhang, Bar-Yosef, et al., 2012), they gained the ability to actively process food and domesticate the foods that could best meet their energy requirements. The first food to be domesticated was rice (Kovach, Sweeney, & McCouch, 2007). The domestication of rice led to a surplus of grain, which then enabled the domestication of animals to meet humans' demand for protein. Around 11,400 years ago, when human civilization entered the Shangshan Culture period (Qiu, Wang, Wu, et al., 2019), humans not only domesticated rice but also saw rapid development in pottery-making technology. At this time, some humans broke away from the way of directly obtaining energy from nature and began to specialize in tool-making, particularly focusing on essential containers like pottery. These pottery makers no longer needed to obtain energy directly from nature; instead, they could exchange the pottery they made with farmers for food and grain to meet their own energy needs from nature. By the Hemudu period, industrial manufacturing

technology became more complex and sophisticated, and technologies such as dugout canoe making emerged (Chen, 2002). Humans who were not directly engaged in material production (food production) could concentrate on the specialized production of various tools. They then used the produced tools, such as dugout canoes and pottery, to directly exchange for food with farmers, thereby meeting their own needs for indirectly obtaining energy. Of course, with the further development of human civilization, tool-making technology became increasingly complex, and the number of people involved in the industrial chain continued to grow. The interactions between these industrial chains led to the emergence of large-scale cities. It can thus be seen that the emergence and development of cities represent humans' departure from the lifestyle of directly obtaining energy through farming and hunting. Therefore, the development of cities is an important symbol of the development of capitalism in human society, and the size of a city reflects the scale of the industrial chain through which energy is obtained indirectly.

From the above analysis of energy cycles, it can be observed that the continuous development of human society toward a more advanced civilization is reflected in the technological sophistication of the ways in which energy is obtained indirectly. The stronger humans' ability to obtain energy indirectly, the higher the level of human civilization reaches. If we follow Marx's view (Burawoy, 1990) that capitalism is an important stage in the development of human civilization, then the meaning of capitalism lies in reflecting the leap of human society from directly obtaining energy from nature to achieving a new height of obtaining energy from nature more indirectly. Thus, we have a fundamental basis in natural laws for exploring what capitalism is. Among the theories that describe the development of human civilization based on natural laws, Marx's theory is the most successful and representative one.

Therefore, this book basically adopts Marx's understanding of capitalism (Marx, 2004, V1). Capitalism must possess the following key characteristics:

First, there must be capitalists. Unlike in agrarian societies, capitalists do not need to obtain energy directly from the land, or rather, they no longer need to acquire energy directly from nature to accumulate their capital and wealth. They

then use this capital to manage other employed workers and indirectly obtain natural resources. Since capitalists operate at the level of utilizing capital, they occupy the top tier of the entire capitalist society.

Second, a capitalist society must have wage workers. After all, although capitalists operate capital to obtain energy indirectly, their objective is essentially the same as that of farmers. To achieve this goal, capitalists need to employ workers.

Third, the third important characteristic of a capitalist society is the existence of capital. Capital is mainly in the form of currency, which means that a capitalist society must have an advanced currency exchange system. Currency itself has no inherent value, but when it is used for commodity exchange, it acquires exchange value. In essence, currency serves as a medium for commodity exchange in a capitalist society.

Fourth, the fourth important characteristic of a capitalist society is the presence of a large number of commodities. In the initial stage, these commodities mainly met the needs of farmers in agrarian societies for farming and cultivation, such as plows for tilling the land and knives for chopping firewood. As the scale of wage workers expanded, these workers also required various tools to meet their own survival needs and thereby obtain energy more efficiently (albeit indirectly). Since workers no longer obtained what they needed directly from nature, the tools and commodities they required became more complex, such as specialized textile equipment for production. As the industrial chain became increasingly complex, the needs of wage workers also became more diversified, which in turn drove the enrichment of commodity types in capitalist society and promoted its prosperous development.

References

[1] Chen, J. C. Y. (2002). Sea Nomads in Prehistory on the Southeast coast of China. Bulletin of the Indo-Pacific Prehistory Association, 22(6), 51-54.

[2] Goldman, S. (2013). Capitalism in Ancient Rome and Ancient Greece: Risk and Unethical Business.

[3] Jahan, S., & Mahmud, A. S. (2015). What Is Capitalism? International Monetary Fund, 52(2), 44-45. https://www.imf.org/en/Publications/fandd/issues/Series/Back-to-Basics/Capitalism

[4] Kovach, M. J., Sweeney, M. T., & McCouch, S. R. (2007). New Insights into the History of Rice Domestication. Trends in Genetics, 23(11), 578-587.

[5] Li, Z. (李喆) (2012). 《资本论》中的资本主义起源论新探. 教学与研究, 47(1), 32.

[6] Merriam Webster (2025). Definition: Capitalism. Merriam-Webster Dictionary. https://www.merriam-webster.com/dictionary/capitalism

[7] Nozick, R. (1998). Why Do Intellectuals Oppose Capitalism? Cato Policy Report, 20(1), 8-11.

[8] Qiu, Z., Jiang, L., Wang, C., Hill, D. V., & Wu, Y. (2019). New Evidence for Rice Cultivation from the Early Neolithic Hehuashan Site. Archaeological and Anthropological Sciences, 11(4), 1259-1272.

[9] Wu, X., Zhang, C., Goldberg, P., Cohen, D., Pan, Y., Arpin, T., & Bar-Yosef, O. (2012). Early Pottery at 20,000 Years Ago in Xianrendong Cave, China. Science, 336(6089), 1696-1700.

Chapter 2. A Capitalist Development Model Based on Social Thermodynamics

Capitalist society has established a highly free trade system. Within this system, various elements of social interaction can fully release their effectiveness—once there is energy input from the external environment, the formation and evolution of society will break free from the constraints of the will of social members, develop independently, and tend toward a relatively stable state.

The core feature of an agricultural society is that humans obtain energy directly from nature to sustain their survival. After the establishment of capitalist society, this model underwent a fundamental transformation: a large number of social members no longer need to meet their living needs by directly obtaining energy from nature. Instead, they can create value carriers such as intellectual property rights and industrial products through intellectual labor, industrial production, and other means, and then exchange goods with farmers engaged in farming in agricultural societies to ensure their basic survival. At the same time, capitalists help farmers increase grain output by providing advanced production technologies, further improving the trade chain. It is in this dynamic process that the trade system continues to mature, and capitalist society gradually takes shape accordingly.

In the following, the method of social thermodynamics (Cheng, 2023) will be used to conduct an analysis with the example of population expansion in a small region. The focus will be on measuring the "social temperature" (Cheng, 2023, pp. 166-170) and "social pressure" (Cheng, 2023, pp. 160-166) of this small society, and discussing the possible "phase transition" (Cheng, 2023, pp. 274-276) of the social system under the background of population growth.

The selected research area covers an area of 75 square kilometers, with a maximum population size of 20,000. Based on the theory of social thermodynamics, the parameters of "social space" (Cheng, 2023, pp. 152-157) and "social pressure" of this society can be easily calculated when the "social temperature" is 300 K. The "social temperature" is set to 300 K here, mainly determined based on the ambient temperature and the energy acquisition level of social individuals. For simplicity, we first consider the case where there is no interaction between social individuals. For the specific calculation logic, please refer to the relevant cases in the book *Social Thermodynamics* (Cheng, 2023, pp. 253-263).

To balance calculation accuracy and content readability (especially to meet the needs of readers with weak mathematical foundations), this book introduces the large model DeepSeek (Liu, Feng, Piao, et al., 2024; Guo, Yang, Tan, et al., 2025) in the relevant calculation sections. Using this model for calculations can significantly improve the accuracy of calculation results. The specific method is to directly add the chapter's content in document format into DeepSeek, allow it to learn this calculation method, and then put forward corresponding social thermodynamics problems for it to solve. Large Language Models such as DeepSeek can then use these rules for analysis and calculation.

First, we use the social ideal gas state equation (Cheng, 2023, p. 184):

$$P_S V_S = n\, k_S T_S$$

Among them:

- P_S is the social pressure (to be calculated)
- V_S is the social volume or space (regional area × height) (Cheng, 2023, p. 154)
- $N = 20000$ (population size)
- $T_S = 300\ \mathrm{K}$ (social temperature)
- $K_S = \frac{mR}{\mu}$ (social Boltzmann constant)

Assume that the mass of each person $m = 70\ \mathrm{kg}$ (standard adult mass), the

molar mass of water $\mu = 0.018\ \text{kg/mol}$, and the universal gas constant $R = 8.314\ \text{J/(mol} \cdot \text{K)}$.

1. Calculate the Social Boltzmann Constant (Cheng, 2023, p. 231) k_S

$$k_S = \frac{mR}{\mu} = \frac{70 \times 8.314}{0.018} \approx \frac{581.98}{0.018} \approx 32332.22\ \text{J/K}$$

2. Calculate the Social Volume V_S

$$Regionalarea = 75\ \text{km}^2 = 75 \times 10^6\ \text{m}^2$$

$$Height = 2\ \text{m}$$

$$V_S = 75 \times 10^6 \times 2 = 1.5 \times 10^8\ \text{m}^3$$

3. Substitute into the State Equation to Solve for Social Pressure P_S

$$P_S V_S = n k_S T_S$$

$$P_S = \frac{n k_S T_S}{V_S}$$

Substitute the values:

- $N = 20000$
- $K_S = 32332.22\ \text{J/K}$
- $T_S = 300\ \text{K}$
- $V_S = 1.5 \times 10^8\ \text{m}^3$

$$P_S = \frac{20000 \times 32332.22 \times 300}{1.5 \times 10^8}$$

$$P_S \approx 1293.29\ \text{Pa}$$

4. Results and Discussion

- The social pressure $P_S \approx 1293.29$ Pa (Pascal).
- This pressure can be analogous to a quantitative indicator of internal social competition, conflicts, or density.

The "social temperature" of 300 K is exactly equivalent to the ambient temperature, and this value is at a critical balance point—it can meet the core condition for the environment to transmit energy to society through temperature difference. In this state, the "social pressure" faced by this society is approximately 1300 Pa. Such pressure mainly comes from external factors such as external environmental interference and biological invasion, and its value is at a relatively low level. However, it is worth noting that even such a weak pressure is sufficient to maintain the social temperature at a relatively high level of nearly 300 K.

The above calculation results indicate that the pressure on this society is relatively low, but this conclusion holds on the premise that the "social space" available for the survival of the society in this region is sufficient. In areas with special landforms such as hills and deserts, a large amount of area is unsuitable for human habitation due to natural conditions. Therefore, the situation of "wide overall geographical area but narrow actual livable social space" often occurs.

It should be clearly noted that human society is essentially different from ideal gas: there are complex interactions between social individuals. Therefore, when analyzing such problems, the van der Waals equation that considers internal interactions must be adopted. With the help of this equation, the stability of the social system can be effectively judged: if the society is in a "gaseous" state similar to ideal gas, its stability will be significantly insufficient—just as gas is prone to deformation, compression, and expansion; when the society enters a "condensed state" similar to liquid or solid under specific conditions, it will show higher stability (Cheng, 2023, pp. 265-267). It can be seen that the van der Waals equation is an effective tool to distinguish whether a social system is in a "gaseous state" or a "condensed state".

Now, let us assume that in the society of this region, the van der Waals constant a is 1.5×10^8 $(\mathrm{Pa} \cdot \mathrm{m}^6)$ (Cheng, 2023, pp. 187-190), and the physical space or volume of a person is 0.06 m^3. However, unlike animals, humans also have social space, which will increase the van der Waals parameter b. Through the van der Waals equation, the critical temperature and critical volume in this

society can be calculated.

We use the van der Waals equation to simulate the social system, following the example of the Xiongnu society in the book *Social Thermodynamics* (Cheng, 2023, pp. 300-306), and appropriately improving some of the parameters. Among them:

- van der Waals constant $a = 1.5 \times 10^8$ Pa·m^6 (representing social attraction/cohesion)
- Volume per person $b = 10$ m^3 (representing the incompressible volume of an individual, i.e., repulsive effect; social space is considered here, which is equivalent to each person occupying an area of 5 m²)
- Total social population $n = 20000$
- Total social volume $V_S = 1.5 \times 10^8$m^3 (regional area 75 km² × height 2 m)

The van der Waals equation for N moles of gas is:

$$(P + \frac{aN^2}{V^2})(V - Nb) = NRT$$

However, note that the social Boltzmann constant k_S has been defined (equivalent to the role of NR), but the van der Waals equation is usually expressed in terms of moles. We need to make adjustments to maintain consistency.

1. Redefine the van der Waals Equation for the Social System

In the previous model, the state equation is $P_S V_S = n\, k_S T_S$, where $k_S = \frac{mR}{\mu}$ (equivalent gas constant per person).

For van der Waals correction, we write:

$$(P_S + \frac{an^2}{V_S^2})(V_S - nb) = nk_S T_S$$

Among them:

- $a = 1.5 \times 10^8$ Pa·m^6
- $b = 10$ m^3 (excluded volume per person)
- $n = 20000$
- $V_S = 1.5 \times 10^8$ m^3
- $k_S = \frac{mR}{\mu} = 32332.22$ J/K (assuming $m = 70$ kg)

2. Critical Parameter Formula

For van der Waals gas, the critical point satisfies:

$$T_c = \frac{8a}{27bk_S}, V_c = 3nb, P_c = \frac{a}{27b^2}$$

The specific calculation results are:

$$V_c = 3nb = 3 \times 20000 \times 10 = 600000 \text{ m}^3$$

$$P_c = \frac{a}{27b^2} = \frac{1.5 \times 10^8}{27 \times (10)^2} \approx 5.556 \times 10^4 \text{ Pa}$$

$$T_c = \frac{8a}{27bk_S} = \frac{8 \times 1.5 \times 10^8}{27 \times 10 \times 32332.22} \approx 137 \text{ K}$$

It can be seen from the calculation results that due to the extremely weak interaction intensity between social individuals, the critical temperature of the entire social system is significantly low. Considering the reality that the social system usually maintains a "social temperature" of about 300 K, the social temperature far exceeds the critical temperature of the system, which means that this society cannot enter a stable condensed state at all and thus is a typical unstable society.

However, the calculation results also reveal a key law: if the interaction intensity between social individuals is increased by 10 times, the critical temperature of the system can jump to 1370 K. This value is much higher than the conventional

social temperature of 300 K, which is sufficient for the society to easily enter a condensed state. The enhancement of the interaction intensity between individuals can be achieved by establishing a strong leader, and the ancient Xiongnu society is a typical example of this mechanism (Cheng, 2023, pp. 300-306).

The above characteristics are the core attributes of the "Social Oriented Society" (Cheng, 2023, pp. 80-82)—relying on a strong core leadership to unite individuals. However, for the "Family Oriented Society" (Cheng, 2023, pp. 80-82), its operation logic is different: this type of society is formed by the aggregation of multiple families, without a unified strong leader. Instead, it takes the family as the basic unit, and with parents as the internal leaders, it builds a strong interaction between individuals within the family, making each family form a condensed state first. On this basis, families further strengthen the connection between units through gender-based interaction forms such as marriage. Since the intensity of gender interaction is much higher than that of general social interaction, the entire Family Oriented Society can eventually enter a stable condensed state like the Social Oriented Society with strong and powerful leadership.

Considering various internal interactions in the society, we need to redefine the van der Waals equation for the family-type social system. The relevant parameters of the social van der Waals equation will be revised to:

- $a = 1.5 \times 10^{10}$ Pa·m^6
- $b = 100\text{m}^3$ (excluded volume per family)
- $n = 2000$
- $V_S = 1.5 \times 10^8$ m^3
- $k_S = 10 \times \frac{mR}{\mu} = 323322.2$ J/K (assuming $m = 70$ kg)

The specific calculation results are:

$$V_c = 3nb = 3 \times 20000 \times 10 = 600000 \text{ m}^3$$

$$P_c = \frac{a}{27b^2} = \frac{1.5 \times 10^{10}}{27 \times (100)^2} \approx 5.556 \times 10^4 \text{ Pa}$$

$$T_c = \frac{8a}{27bk_S} = \frac{8 \times 1.5 \times 10^{10}}{27 \times 100 \times 323322.2} \approx 1370\ \mathrm{K}$$

It can be seen from the above calculation results that in the Family Oriented Society, gender interaction occupies a core position in the entire social interaction system, which significantly increases the overall interaction intensity between social individuals. Under this premise, even if the population size of a family increases, the critical parameters of the system can still remain stable, and the entire society can always maintain a condensed state. In terms of stability effect, this is completely equivalent to the cohesive effect of the "strong leader" in the Social Oriented Society.

Under the framework of the above thermodynamic model, the core parameters affecting the stability of the society are essentially directly related to the interaction intensity between social individuals. Specifically, the intensity of conventional social interaction in the Social Oriented Society is relatively weak; while the Family Oriented Society, due to the introduction of gender interaction whose intensity is far higher than that of conventional social interaction, can maintain a condensed state even in a highly free self-organized state, thus having strong internal stability. In contrast, the Social Oriented Society must rely on a strong leader to strengthen the connection between individuals to increase the interaction intensity, thereby entering a condensed state and achieving social stability.

In addition, it should be emphasized that the critical temperature is also closely related to the size of the individual's "social space" or "social volume": when the individual's social space expands, the critical temperature of the system will decrease accordingly, and the society is likely to transform from a stable state to an unstable "gaseous state". The social space here essentially reflects the interaction state between an individual and other social members, and its influencing factors are diverse. For example, in the primitive agricultural society, the individual's social space was relatively narrow; when commercial trade emerged, individuals needed to conduct commodity exchanges with others through monetary media, and this process would significantly expand their social space.

The expansion of social space will inevitably lead to a rapid decline in the critical temperature, and the sharp drop in the critical temperature will destroy the originally stable condensed state of the Family Oriented Society, thereby triggering social changes. If this market economy form based on commodity trade is defined as capitalism, then this transformation process actually marks the emergence and rise of capitalism.

Further analysis combining the cases of Social Oriented Society (Cheng, 2023, pp. 300-306) and Family Oriented Society (Cheng, 2023, pp. 329-334) shows that when commodity trade causes the social space of individuals or families to expand by 10 times, the critical temperature of the system will quickly drop to 137 K. This value is much lower than the normal social operating temperature of 300 K, which will inevitably trigger a social stability crisis. This also explains why the transition from a closed small-scale peasant economy to a capitalist society is often accompanied by severe social turbulence—the history of the European bourgeois revolution has confirmed this to a certain extent (McPhee, 2001). During the transition from feudal society to capitalist society in Europe, the "Enclosure Movement" (Dyer, 2006) implemented by capitalists for primitive accumulation caused serious social problems due to its intense and cruel process.

However, from the perspective of calculation logic, this social transformation process is not necessarily accompanied by turbulence, and in fact, a smooth transition is possible. The key lies in: when the individual's social space expands, if the interaction intensity between social individuals can be increased simultaneously, and the increase in interaction exceeds the increase in social space, the critical temperature of the system will not decrease but may rise instead.

Taking a specific calculation as an example: if the individual's social space expands by 10 times, and at the same time, the interaction intensity between individuals increases by 100 times, the critical temperature of the system can rise to 13700 K. Such a high critical temperature means that in the isotherm map solved by the van der Waals equation (Cheng, 2023, p. 268), there will be more isothermal intervals that can maintain the condensed state. Even if the social temperature fluctuates greatly due to external factors, the system can still

maintain a stable condensed state.

Then, can social stability be maintained by limiting the individual's social space? For example, some societies reduce the social space by preventing free communication between individuals. Although this method may work in the short term, from the perspective of the thermodynamic model, restricting communication will inevitably lead to a simultaneous weakening of the social interaction intensity—this will offset the effect of reducing the social space, and eventually not only fail to increase the critical temperature but may also cause it to further decrease, which is not worth the gain.

Therefore, the core issue is not how to suppress the expansion of social space, but to deeply analyze the root cause of the expansion of social space. As mentioned earlier, the expansion of social space is mainly due to the increase in the frequency of commodity trade; the demand for frequent commodity trade is essentially generated by social individuals to obtain living materials, meet nutritional needs, and improve the quality of life through currency exchange. This demand is rooted in the human instinct for survival and development, and it is also the underlying driving force for the evolution of social forms.

According to the calculation results of the relevant chapters in the book *Social Thermodynamics* (Cheng, 2023, pp. 208-211), we can see the relationship between human's own nutritional needs and social temperature.

If the human body itself consumes 1300 kcal, and an additional 650 kcal is consumed for food processing, the total energy consumption is 1950 kcal per person per day.

1. Calculate the Total Daily Energy Consumption per Person

- Human metabolism: 1300 kcal
- Food processing: 650 kcal
- Total consumption: 1300 + 650 = 1950 kcal per person per day

Convert to joules:

$$1950 \times 4184 = 8158800\ J\ perperson\ perday$$

2. Total Daily Energy Consumption of 20,000 People

$$20000 \times 8158800 = 1.63176 \times 10^{11}\ J/day$$

3. Consider Two-Dimensional Space (Degree of Freedom = 2)

According to the Equipartition Theorem (Lima & Plastino, 2000), the internal energy of a two-dimensional space is:

$$U = nk_S T$$

Recalculate the social Boltzmann constant based on the average weight of social individuals being 60 kg.

Among them:

- $m = 60$ kg (average weight)
- $R = 8.314$ J/(mol · K) (universal gas constant)
- $\mu = 0.018$ kg/mol (molar mass of water)
- $k_S = \frac{60 \times 8.314}{0.018} \approx 27713.33$ J/K

4. Calculate the Social Temperature

$$T = \frac{U}{nk_S}$$

Among them:

$$T = \frac{U}{nk_S} = \frac{1.63176 \times 10^{11}}{20000 \times 27713.33} \approx 294.4\ \text{K}$$

In a relatively primitive society, human nutritional needs are relatively low, and the "social temperature" driven by this demand is also at a low level. According to the above calculation, the social temperature at this time is only 294.4 K, which is slightly lower than the ambient temperature. This temperature adaptability has become an important foundation for maintaining social stability.

However, when the average energy consumption per individual rises to 1500 kcal, the social temperature will rise to more than 330 K, exceeding the ambient temperature threshold. To meet the additional nutritional needs, more energy must be consumed to improve the efficiency of food acquisition, and at this time, the society enters a state of nutritional surplus.

At the same time, there is a significant temperature difference between the northern and southern parts of the Northern Hemisphere where humans mainly live, and this difference profoundly affects the way humans obtain natural resources. In the south, the average ambient temperature is usually higher than the social temperature, and humans living here can obtain resources relatively easily without additional energy consumption to meet the development needs of society, families, and individuals; in the north, the ambient temperature is much lower than the social temperature. According to the thermodynamic non-equilibrium dissipative structure theory (Prigogine & Lefever, 1973), when the social temperature is higher than the ambient temperature, a large amount of additional energy must be consumed to obtain energy from the environment. This energy consumption pressure forces humans to exert their subjective initiative to develop and manufacture advanced tools—for example, adopting mechanized farming technology to increase agricultural output and using cooking utensils such as pottery jars for refined heating of food. These technological innovations enable humans in the north to stably obtain the nutrition needed for survival whether the social temperature is lower or higher than the natural temperature.

It is worth noting that the production of means of production such as farming tools and pottery jars itself requires additional energy consumption, which has led to the emergence of new social divisions of labor: groups without the skills to produce tools must exchange the food they grow for tools. It is driven by this demand that commodities came into being, and currency, as an equivalent for commodity exchange, emerged accordingly. The emergence of currency has laid the foundation for the germination of capitalism.

From the perspective of the thermodynamic model, when the "excluded space" (Parameter b in the Van der Waals equation) of individuals in a certain region

expands rapidly, the critical temperature of the system will drop significantly, and social stability will be shaken accordingly. For ancient primitive societies, the initial solution to this crisis was population evacuation—by migrating to other regions, reducing the individual's social space, thereby compressing the excluded space, and finally realizing the recovery of the critical temperature. However, when migration channels are blocked and the population continues to grow, changing the production and lifestyle and improving production efficiency become the only choice to meet the nutritional needs of more people.

Population growth directly increases the pressure on land for energy acquisition. The limited farmland in primitive agricultural societies is difficult to bear the expanded demand, so improving the energy output efficiency per unit of land has become inevitable. The improvement of production efficiency is inseparable from the support of advanced tools. This demand directly gave birth to the origin of industry. Taking the invention of pottery jars as an example, although the harvest of wild rice has not changed, humans can obtain more nutrition from it through refined processing such as boiling in pottery jars, which is a typical example of the improvement of early production efficiency.

The application of pottery jars has greatly released production potential, thereby stimulating population growth and forming a large-scale demand for pottery jars. This demand has promoted the deepening of professional division of labor: skilled workers specializing in making pottery jars separated from agricultural production and exchanged pottery jars for food from farmers, which became the earliest form of industry for humans. The archaeological discoveries at the Shangshan Culture site provide evidence for this—the surface of the unearthed pottery jars retains a large number of randomly drawn dotted line patterns (Zhao & Zheng, 2020). These patterns are likely marks used for counting, suggesting that the output of pottery jars had reached a relatively high level at that time. Such large-scale production was difficult to be completed by a single person, so wage labor emerged as the times required: initially, young descendants within the family participated in the production, and later, with the expansion of demand, surplus labor in farming families who had no land to cultivate also gradually joined the pottery jar production industry, and the large-scale employment

model was formed accordingly.

Combining the emergence of industrial technology, the development of commodity trade, and the large-scale characteristics of wage labor, we can infer that the early germination of capitalism had already appeared during the Shangshan Culture period.

Entering the heyday of capitalism, the population shows a highly dense trend, and the individual's social space expands significantly accordingly. However, at this time, the complete and closely connected industrial chain largely offsets the instability caused by the expansion of social space—taking the catering industry as an example, restaurants can receive foreign customers at any time, the required food materials can be supplied in real time through the industrial chain, and chefs can quickly complete the processing. This efficient collaboration significantly increases the interaction intensity between social individuals.

Although the expansion of social space will lead to a decrease in the critical temperature, the high correlation of all links in commodity circulation makes the interaction intensity between social individuals grow faster. Finally, the critical temperature is promoted to a high level, ensuring that the society is always in a stable condensed state.

This mechanism can be further explained through specific scenarios: in densely populated cities, there are many industries such as the textile industry, jade manufacturing industry, shipbuilding industry, transportation industry, and catering industry, and each industry is supported by a complete supporting industrial chain. Taking the textile industry as an example, its industrial chain covers raw material collection, degumming treatment in specialized workshops (through processes such as sun-drying and boiling), spinning and weaving by housewives or textile workshops, sales in cloth stores, and finally, cloth purchase by tailor shops or housewives to make clothing. Based on the exquisite jade artifacts unearthed from the Liangzhu Ancient City, it can be inferred that ancient humans had not only practical needs but also high artistic and aesthetic pursuits for clothing—this means that there were already specialized clothing design practitioners at that time, and more workers needed to be employed to participate

in the production and sales of clothing. As an equivalent to measure the value of various commodities, the jade manufacturing industry also became increasingly prosperous with the development of trade. At the same time, the vigorous development of the textile industry also drove the rise of related industries such as the pottery jar manufacturing industry and the canoe manufacturing industry, forming an industrial linkage effect. This close industrial connection has built a strong social interaction network, which is in sharp contrast to the nomadic peoples in the north who lack trade and industrial chain support.

Now, let us assume that there is an urban core area where 100,000 people gather in a core urban area of 8 square kilometers. There are 10 people in an average family, which means that there are a total of 10,000 households, and the internal interaction within the family is very strong. The interaction intensity between external families, due to the connection of the trade industrial chain, reaches $a = 1.5 \times 10^{13}$ Pa · m^6. Of course, the social space of the family is also enhanced due to trade connections, reaching $b = 600$ m^3.

In this way, with the help of DeepSeek, we can calculate the critical parameters of this urban core area:

$$V_c = 3nb = 3 \times 10{,}000 \times 600 = 18{,}000{,}000 \text{ m}^3$$

$$P_c = \frac{a}{27b^2} = \frac{1.5 \times 10^{13}}{27 \times (600)^2} = \frac{1.5 \times 10^{13}}{27 \times 360{,}000} = \frac{1.5 \times 10^{13}}{9{,}720{,}000} \approx 1.543 \times 10^6 \text{ Pa}$$

$$T_c = \frac{8a}{27bk_S'} = \frac{8 \times 1.5 \times 10^{13}}{27 \times 600 \times 277{,}133.33} \approx 26{,}726.5 \text{ K}$$

It can be seen that the critical temperature is still very high. This indicates that under the social temperature condition of about 300 K, the entire society is in a very stable condensed state.

From the result of the critical volume, it is about 9 square kilometers, which is slightly larger than the actual core urban area of 8 square kilometers. This indicates that the entire urban area is just within the range of the critical social volume, and the entire society is in a condensed state, which is very stable.

Considering that the entire city has achieved sufficient trade, the population's nutrition in at least the urban core area is very adequate. If each person absorbs 1500 kcal of nutrition per day, and due to the highly developed trade industrial chain, the energy consumed by the entire society will also be relatively large, and the average energy consumed by each person for trade and other purposes will also reach 1500 kcal. In this way, we can calculate the social temperature of this society as:

$$T_S = 452.9\ \mathrm{K}$$

It can be seen that the social temperature is much higher than the ambient temperature. However, due to the use of advanced industrial technology and a complete industrial system, additional energy can be obtained from the outside. Therefore, this society can still meet the needs of all social members to obtain energy from nature with high efficiency.

For this social temperature, the critical pressure of this society can be calculated as:

$$P_C(452.9\ \mathrm{K}) \approx 2 \times 10^6\ \mathrm{Pa}$$

It can be seen that the calculated critical pressure is not negative. This also means that this society cannot spontaneously form a condensed state relying solely on its own internal interactions. Its condensed state must be realized with the help of appropriate external pressure. This actually shows that the stability of this society is closely related to the openness of this society. The more thorough the openness, the greater the external pressure imposed, and naturally, the easier it is for the entire society to enter a condensed state. A completely closed society, lacking external pressure, will naturally undergo a phase transition to a gaseous state, and eventually, the entire city will cease to exist.

The same method can also be used for calculation in the case of a Social Oriented Society. For a society with 100,000 people, relying on trade, its internal social interaction can reach $a = 1.5 \times 10^{11}\ \mathrm{Pa} \cdot \mathrm{m}^6$, and the excluded space per person can reach $60\ \mathrm{m}^3$. Using DeepSeek, we can calculate the critical parameters of this society as:

$$V_c = 3nb = 3 \times 100{,}000 \times 60 = 18{,}000{,}000 \text{ m}^3$$

$$P_c = \frac{a}{27b^2} = \frac{1.5 \times 10^{11}}{27 \times (60)^2} \approx 1.543 \times 10^6 \text{ Pa}$$

$$T_c = \frac{8a}{27bk_S'} = \frac{8 \times 1.5 \times 10^{11}}{27 \times 60 \times 27713.33} \approx 26{,}726.5 \text{ K}$$

It can be seen that the critical parameters of this Social Oriented Society are the same as those of the Family Oriented Society mentioned above.

Similarly, we can also calculate that when the total energy consumed by this Social Oriented Society for obtaining nutritional conditions and processing food per person is the same as that of the Family Oriented Society, their social temperatures are also the same, i.e., $T_s = 452.9$ K. Naturally, the critical pressure corresponding to this social temperature is also exactly the same.

However, we can also see that the actual Family Oriented Society still has its own characteristics compared with the Social Oriented Society. For example, comparing Tokyo and London, the urban population density of the Family Oriented Society is much higher, which means that the excluded space per person in the Family Oriented Society is slightly smaller than that in the Social Oriented Society. This will lead to a certain increase in the critical temperature of the Family Oriented Society.

From the above analysis, we can see that in the case of a relatively primitive lifestyle, all food acquisition can be directly obtained from nature, including wild rice and hunting of wild animals. In this case, the social temperature of the entire society will be relatively low. If the social temperature is lower than the temperature of nature, according to the second law of thermodynamics, humans can easily obtain energy from nature.

However, to cope with the impact of harsh climates and extremely low temperatures in certain periods, humans learned to use fire and invented pottery jars 20,000 years ago, which enabled humans to use technology to obtain additional energy from nature. Of course, in the process of obtaining this additional

energy, humans also need to consume more additional energy to complete it. Under the condition of continuous input of additional energy, the social temperature of the society composed of humans is also constantly rising. Even when it exceeds the ambient temperature, humans can still easily obtain sufficient energy from nature to meet their own nutritional needs.

The rise of social temperature has made humans gradually break away from the way of directly obtaining energy from nature, such as hunting and gathering wild fruits. Even in the end, it is difficult for humans to adapt to the requirements of higher social temperature by directly cultivating domesticated plants and animals. At this time, more advanced industrial and information technologies have emerged, and the trade system has been established accordingly and is becoming increasingly perfect. When a complete industrial chain, commodity trade system, and the system of employing workers are formed, capitalism emerges.

References

[1] Cheng, Z. (2023). Social Thermodynamics: An Interdisciplinary View. Lausanne; New York: Peter Lang Publishing Inc.

[2] Dyer, C. (2006). Conflict in the Landscape: The Enclosure Movement in England, 1220-1349. Landscape History, 28(1), 21-33.

[3] Guo, D., Yang, D., Zhang, H., Song, J., Wang, P., Zhu, Q., et al. (2025). DeepSeek-R1 Incentivizes Reasoning in LLMs through Reinforcement Learning. Nature, 645(8081), 633-638.

[4] Lima, J. A. S., & Plastino, A. R. (2000). On the Classical Energy Equipartition Theorem. Brazilian Journal of Physics, 30, 176-180.

[5] Liu, A., Feng, B., Xue, B., Wang, B., Wu, B., Lu, C., et al. (2024). DeepSeek-V3 Technical Report. arXiv preprint arXiv:2412.19437.

[6] McPhee, P. (2001). The French Revolution, 1789-1799. Oxford University Press.

[7] Prigogine, I., & Lefever, R. (1973). Theory of Dissipative Structures. In Synergetics: Cooperative Phenomena in Multi-Component Systems (pp. 124-135). Wiesbaden: Vieweg+ Teubner Verlag.

[8] Zhao, Y., & Zheng, L. (2020). Liangzhu Pottery. Springer Singapore.

Chapter 3. Summary of Das Kapital

The Marxist theoretical system is broad and profound, mainly composed of three major theoretical pillars: Marxist philosophy, Marxist political economy, and scientific socialism (Tian, 2025).

Marxist philosophy draws on the essence of German classical philosophy. Among them, Hegel's dialectics (Maybee, 2016) and Feuerbach's materialism (Taylor, 1978) complement each other, jointly laying the foundation of Marxist philosophy—dialectical materialism (Lefebvre, 2009). Marxist political economy, on the other hand, is a critique and inheritance of British classical political economy. British classical political economy represented by Adam Smith (Smith, 1987) and David Ricardo (Ricardo, 1955) provided it with rich ideological resources. On this basis, Marx conducted an in-depth analysis of the theory of surplus value (Marx, 2004), thus constructing the theoretical edifice of Marxist political economy. Scientific socialism (Thomas, 2008) inherited the rational core of French utopian socialism (Vieira, 2010) and realized the great leap of socialism from utopia to science.

Within Marx's framework of dialectical materialism, the relationship between matter and consciousness is clearly expounded: matter determines consciousness, and consciousness in turn reacts on matter. This principle is also applicable in the fields of historical development and political economy, manifested in the way that productive forces determine production relations, and production relations in turn react on productive forces. In the theory of political economy, the labor theory of value occupies a core position. It points out that one of the values of a commodity originates from labor creation, and the value of labor is measured by the necessary labor time spent on producing the commodity. This theory provides a prerequisite for quantifying the surplus value exploited by the bourgeoisie from the proletariat. At the same time, labor is divided into simple labor and complex labor. The latter can improve efficiency due to its involvement in more in-depth mental labor, and the value it creates needs to be

measured by multiplying the value of simple labor by a corresponding factor.

Based on Marxist historical materialism, scientific socialism predicts that when the development of productive forces exceeds the adaptive scope of bourgeois production relations, the socialist system will inevitably emerge and replace the capitalist system. Although Marx's conception of socialist theory was somewhat rough due to the lack of practical references, after the late 1970s, Marxist theorists in China put forward the theory of the primary stage of socialism (Chang, 1996; Wilson, 1989), which effectively made up for this deficiency. Marx's profound insight into the rule and practice of European capitalism has made his theory a powerful tool for describing capitalism. This book also draws on the in-depth analysis of capitalism and relevant theoretical propositions in Marxist political economy.

3.1. The Establishment of Marxist Political Economy Theory

In capitalist society, the dialectical relationship between productive forces and production relations is particularly prominent. Looking back at the feudal society of medieval Europe, feudal landlords and the church took various measures to hinder the development of productive forces in order to maintain their own rule, which greatly restricted social development. At that time, although peasants belonged to the proletariat, their personal freedom was severely restricted, and they were essentially in the status of serfs. Due to the lack of effective mechanisms for trade and commodity exchange, feudal society fell into stagnation and isolation in its overall development. The cruel rule of the medieval church also greatly suppressed the freedom of thought and advanced scientific and technological theories. Copernicus' heliocentrism (Rabin, 2004), Galileo's (Brecht, 2015) mechanical theories, and others were all suppressed. Bruno (Rowland, 2009) was even executed by the church for advocating heliocentrism. These are all typical examples of how medieval feudal society hindered the development of productive forces.

Against this background, the bourgeoisie began to reflect on their own

development needs and the suppression of new ideas by feudal society and church rule. Under the new historical context, British classical political economists such as Adam Smith began to deeply consider the role of capitalism and put forward ideas related to the labor theory of value. On this basis, Marx proposed the theory of surplus value (Singh, 1959; Marx, 2004). This theory points out that most of the value created by workers in their labor is exploited by capitalists, which is the source of capitalists' profits. However, the theories of Adam Smith and others were still immature. Only by basing himself on dialectical materialism and applying theories such as productive forces and production relations as well as the labor theory of value was Marx able to correctly analyze how the surplus value of the working class is exploited by capitalists. This is precisely the reason why Marx's *Das Kapital* has exerted a huge influence worldwide.

3.2. Commodities and Money

In the discussion of *Das Kapital*, it can be found that a commodity is a labor product used for exchange (Marx, 2004, Vol. 1, pp. 47-54). This means that although we create a variety of products through labor, these products do not automatically become commodities. For this reason, Marx further analyzed the dual attributes of commodities, namely use value and value.

First of all, the use value of a commodity is the prerequisite for its existence; a commodity without use value has no value to speak of. In *Das Kapital*, Marx stated: "Before a commodity can be realized as value, it must prove itself to be a use value, because human labor expended on a commodity is only meaningful if it is expended in a form useful to others. However, whether this labor is useful to others and whether its product can meet the needs of others can only be verified in the exchange of commodities." (Marx, 2004, Vol. 1, p. 105) It can be seen from this that in the duality of commodities, the realization of value is conditional. Not all products created through labor can become commodities. To realize its value, a commodity must prove its use value through the market, and this use value must be recognized by others. If the product produced by a worker is not regarded as useful by others, its value cannot be realized. This is consistent with the demand theory in modern economics. From the hierarchy of needs

theory put forward by psychologist Maslow in the 20th century (Maslow & Lewis, 1987), we can see that consumers' demand for labor products is hierarchical. At the same time, when consumers obtain a certain quantity of labor products, their demand for additional identical products will weaken, which naturally leads to a decrease in the use value of the products produced by workers.

Secondly, if we only describe commodities from the perspective of use value, we will face a problem: since use value is determined based on the specific utility function of each commodity, the use value of different commodities varies. Therefore, in order to describe the important characteristics of commodities in a more general way, *Das Kapital* introduces the concept of value. Value aims to eliminate the differences in use value and provide a general description of all different commodities through an abstract concept. Although value is an abstract concept, the value of a commodity is obviously directly determined by its use value. That is, "the value of each commodity is determined by the amount of labor materialized in its use value, and by the socially necessary labor time required to produce the commodity." (Marx, 2004, Vol. 1, pp. 52, 218)

Since value is a concept abstracted from use value, the statement that "it is useful to consumers" also needs a more general concept for definition. In modern economics, the concept of "demand" is usually used. That is, regardless of how consumers use a product, it is because they have a demand for that commodity.

Therefore, from the perspective of the more general concept of value, a commodity has value because it can meet the needs of consumers. However, how do consumers transform their demand into the value of a commodity? This leads to another concept of value—exchange value (Marx, 2004, Vol. 1, pp. 49, 218). Exchange value refers to the value formed in the process of commodity exchange. A commodity exchange can be either the exchange between commodities or the exchange between commodities and money. If it is the exchange between commodities and money, a price is formed, that is, the exchange value is manifested as the market price.

Das Kapital holds that the market price of a commodity fluctuates around its value and is affected by the relationship between supply and demand of the commodity. The value of a commodity, on the other hand, is determined by the socially necessary labor time required to produce the corresponding commodity.

As for money, the definition in *Das Kapital* is: money is the universal equivalent in the process of commodity exchange. "Only social activity can make a specific commodity a universal equivalent. Therefore, all other commodities, through social action, separate out a specific commodity and fully express their values through this commodity. Thus, the natural form of this commodity becomes the socially recognized equivalent form. Through this social process, serving as the universal equivalent becomes the special social function of the separated commodity. This commodity then becomes money." (Marx, 2004, Vol. 1, pp. 52, 105, 218)

Therefore, money emerges only in the process of commodity exchange. Money is a special kind of commodity, but as the equivalent form of commodities, it does not contain specific provisions on the quantity of commodity value. After all, for money such as gold coins, we cannot directly determine their own value through the necessary labor time in the same way as we judge other commodities.

As a special kind of monetary commodity, it has different functions from other commodities. *Das Kapital* holds that (Marx, 2004, Vol. 1, pp. 114-170) money has five functions. These functions are mainly reflected in the following aspects:

1. As a measure of value, it reflects the level of value of other commodities. In fact, various products can be exchanged through barter in addition to using money for exchange. However, with money as a measure of value, we can more clearly understand the true value of a commodity.

2. As a medium of circulation. Although commodities can circulate through barter, the efficiency of this kind of circulation is low. With the adoption of money, the entire process of commodity circulation can rely on the form of money and circulate in the market with the highest efficiency

directly. This is an important function realized by money, and the efficiency of other products in realizing this function is much lower.

3. The function of storage. When the value of a commodity is expressed in the form of money as a universal equivalent, consumers can take advantage of the portability and circulation of money, use it as a means of reserve, convert the value of various commodities or the surplus part of the use value of different commodities into money for storage, and use it when needed.

4. The function of payment, that is, directly using money to purchase the value of commodities in the process of commodity transactions, which is more convenient than directly exchanging one commodity for another.

5. World currency. Domestically, money can circulate freely; but internationally, due to different agreements on universal equivalents, commodity transactions may be hindered. However, if a currency recognized by all countries is used, such as precious metals like gold and silver, transactions can be conducted worldwide and global trade can be realized. Among paper currencies, the US dollar currently has the function of world currency to a certain extent.

3.3. The Labor Theory of Value

Marx pointed out that "the essence of the labor process lies in useful labor that produces use value" (Marx, 2004, Vol. 1, p. 227). That is to say, labor can create value, but only labor that can produce use value is useful labor, which means that only useful labor can create value. In other words, in the process of commodity production, human useful labor is condensed, which is the starting point of the labor theory of value.

From the above analysis, it is not difficult for us to find that commodities contain two dual factors: use value and value. In this duality of commodities, use value is created by useful labor, so what creates value? In fact, although both use value and value originate from useful labor, the nature of the useful labor that creates them is different. Of course, for the sake of simplicity, unless

specifically emphasized, the term "labor" mentioned later generally refers to useful labor. In this way, in Marx's *Das Kapital*, labor is divided into two types, corresponding to the creation of use value and value respectively. This is the duality of labor—concrete labor and abstract labor.

Concrete labor refers to the forms of labor that can directly create specific use values. It focuses on the specific attributes and functions of products and is the direct driving force for the realization of use value. Abstract labor, on the other hand, is a more general concept of labor. It transcends the details of concrete labor and focuses on the human energy and time consumed in the labor process. All labor, at this level, shows similar characteristics and can be measured by a unified standard, which is the essence of abstract labor. Abstract labor is precisely the source of value.

Through such an analysis, we can clearly see that use value is closely linked to concrete labor, and it refers to the specific forms of labor required in the production process of specific products. When this special product is transformed into a commodity, it possesses use value. Value, on the other hand, is a more universal and abstract concept, which is closely related to abstract labor. The value of all commodities is essentially the same because they all embody the fruits of abstract labor. In this way, we have two specific concepts and two general concepts: use value and value, as well as concrete labor and abstract labor that create them.

In terms of the use value of a commodity, it is directly created by concrete labor. From the perspective of the labor theory of value, the useful part of concrete labor is the direct source of the use value of a commodity. Correspondingly, the value of a commodity is created by abstract labor. The part of abstract labor that can meet the needs of others is the foundation of the value of a commodity.

With the concepts of abstract labor and value, we can further define a new concept—magnitude of value. The magnitude of value is a specific numerical indicator used to compare the level of value between different commodities. Within the framework of the labor theory of value, the magnitude of value of a commodity is determined by the socially necessary labor time spent on producing

that kind of commodity. The measurement of socially necessary labor time is relatively simple and direct, and it can be directly expressed and calculated through the unit of time.

However, with the development of industrial technology and information technology, with the help of these technologies, human beings can create greater value of commodities in less socially necessary labor time. Therefore, human labor, whether concrete labor or abstract labor, is still of great complexity, and the results produced by different types of labor vary. With the "socially necessary labor time" as a measurement standard, it can provide a criterion for distinguishing between complex labor and simple labor.

Specifically, complex labor often involves more human cognitive abilities, condenses more human wisdom, and may apply advanced science and technology. Therefore, the quantity of products produced by complex labor is usually larger than that produced by simple labor. From this perspective, the socially necessary labor time generated by complex labor is much longer than that of simple labor. For example, comparing machine production of textiles with manual production of textiles, machine production requires less absolute time, but because it incorporates more complex technology and wisdom, according to the calculation of socially necessary labor time, the value it creates is actually greater. This is because although the absolute time required for machine production of products is less, the socially necessary labor time required is longer. Therefore, measured by socially necessary labor time, the labor value condensed in the same products produced by complex labor and simple labor is equal because the socially necessary labor time invested in them is the same.

With the concept of labor value derived from socially necessary labor time, we can further analyze the exploitation of the working class by capitalists. After spending the appropriate social necessary labor time, workers will create labor value in commodities. Capitalists sell commodities in accordance with market laws and obtain income corresponding to the corresponding price. If the distribution process of commodity income is fair, capitalists should return all the labor value condensed in the commodity production process to the working class, and capitalists can only obtain remuneration corresponding to the socially

necessary labor time they have spent in the trade process. In this way, the fair distribution of labor and wealth can be realized.

However, in capitalist society, in order to pursue greater profits, capitalists often adopt hidden means. They sell commodities in accordance with the law of value, but deduct a part of the labor value generated by socially necessary labor time, and only distribute the part of labor value required for the reproduction of the working class's labor force to workers. The surplus labor value that exceeds the part required for the reproduction of the workers' labor force is completely seized by capitalists. This is a hidden means for capitalists to exploit the surplus labor value of the working class and maximize profits. Because capitalists sell products by taking advantage of market price fluctuations, the specific labor value created by workers is often hidden, which enables capitalists to quietly obtain a part, or even most, of the surplus value of the labor value condensed in commodities created by the working class.

It can be said that Marx's labor theory of value fundamentally reveals the secret of capitalists' exploitation of the surplus value of workers, and provides a solid theoretical basis for further revealing the class contradictions in capitalist society and the basic contradictions of capitalist society.

We can also conduct an in-depth analysis from the perspective of thermodynamics, and it is not difficult to find that there is a subtle interdependent relationship between Marx's theoretical system and the principles of thermodynamics. Especially within the framework of nonlinear thermodynamics, we know that to maintain a relatively stable state of a nonlinear system, continuous energy input is indispensable. Mapping this principle to human society, the injection of energy is mainly achieved through the hard work of workers. This labor process is essentially a process of converting energy into the intrinsic value of products.

In the entire energy cycle, that is, the chain of commodity circulation, in order to maintain the stable operation of the system, it is necessary to rely on the continuous input of external energy. Once this energy is introduced into the system, it is solidified into commodities through the labor of workers, endowing the commodities with value. From this perspective, the view that labor creates value

in the labor theory of value proposed by Marx is logically similar to the principle in thermodynamics that energy input maintains system stability.

Specifically, without sufficient energy supply, that is, insufficient labor input, the entire economic system will be difficult to maintain its stable state, and the commodity economic cycle of capitalism will thus be hindered and unable to operate continuously.

3.4. The Proletariat

In *Das Kapital*, Marx's discussion of the proletariat is quite in-depth and comprehensive. His understanding of the proletariat is not simply equating it with the poor, but rather conducting an analysis from a highly structural and scientific perspective. According to the views in *Das Kapital*, the proletariat is a social class with dual characteristics of freedom. Compared with slaves and serfs, the proletariat in capitalist society enjoys complete personal freedom. This freedom is not only reflected in the absence of personal bondage but also protected by law. However, the other aspect of the proletariat's freedom seems rather helpless—they have no capital of their own, are free to the point of having nothing, and thus can only rely on selling their own labor force to make a living.

In capitalist society, the status and situation of the proletariat in the production system are mainly reflected in the following aspects. Firstly, it is the commercialization of labor force. Due to the lack of capital, the proletariat has to sell their own labor force as a commodity in exchange for the basic means of subsistence. In this context, labor force has become an important commodity in the socialized large-scale production of capitalism.

Secondly, the labor of the proletariat and their production achievements—surplus value—are often exploited by capitalism. Since the proletariat can only rely on selling their labor force to make a living, the price of labor force fluctuates with changes in the market supply and demand relationship. Capitalists take advantage of the sufficient supply of the proletariat's labor force and the continuous decline in prices to purchase a large amount of labor force, and then use this labor force to create more surplus value, which is ultimately occupied by capitalists.

Thirdly, the labor of the proletariat also presents the characteristic of alienation. In this alienated labor, the products produced by workers do not belong to themselves, which leads to strange phenomena such as workers who make clothes having no clothes to wear and workers who make bread having no bread to eat. At the same time, alienation also occurs in the labor in the production process. Labor becomes externalized, and workers are forced to work instead of working out of their own interests and strengths. In addition, labor is also alienated from the essence of human beings, becoming monotonous and repetitive. Compared with the freedom and consciousness that are the essential characteristics of human beings, this even represents a regression compared with primitive society. Finally, the relationship between workers and capitalists is also alienated. The two sides gradually become opposed in the work process, and the working class is also alienated from each other due to competition.

The status and situation of the proletariat are also reflected in pauperization and relative overpopulation. A large number of proletarians lack corresponding skills due to industrial structure transformation and other reasons, becoming relatively surplus population in society, unable to sell their labor force, and thus may fall into the predicament of pauperization. However, for capitalists, this surplus population has become a reserve army for the development of new industries, providing a large number of cheap labor forces for the rapid development of new industries.

In addition, the working class is also dominated and materialized by capital. Since labor force has become a commodity, workers have to be subject to capital, must obey the discipline and rhythm of capital and machines, and have instead become appendages of capital and machines. Although the proletariat is in such a disadvantageous status and situation, it is precisely because they have nothing that they are entrusted with an important historical mission. This historical mission is reflected in the fact that the proletariat shoulders the important task of overthrowing or promoting the transformation of capitalism and has become the gravedigger of capitalism; at the same time, they are also the creators of the new society and bear crucial tasks and responsibilities in the development process of the entire human civilization.

3.5. Capitalist Production Relations

In the theory of political economy, Marx defines production relations as the relations between people in the production process. These relations take various forms and vary with different social systems. In the state of primitive communism, people had equal relations; in slave society, it was the relation between slave owners and slaves; and in capitalist society, production relations are manifested as the relations between capitalists and the proletariat. Specifically, in capitalist society, the relations between the bourgeoisie and the proletariat are reflected in three aspects:

The first is the form of ownership of the means of production, which is the basis for determining the nature of production relations. In capitalist society, the means of production are privately owned by capitalists.

The second is people's status and mutual relations in production, which vary under different ownership systems. In capitalist society, the relationship between capitalists and workers is one of exploitation and being exploited.

The third is the form of product distribution, which is jointly determined by the first two aspects. Capitalist society implements distribution according to capital, leading to a huge gap between the rich and the poor.

The private wealth ownership system in capitalist society emphasizes that wealth belongs to individuals, so it protects private property and holds that private property is inviolable. However, due to the limited lifespan of human beings, wealth can be inherited, and immediate family members or designated heirs can inherit this wealth.

The contradiction between capitalists and the working class is essentially a contradiction between exploitation and being exploited. Different from slave society, where slaves were deprived of all means of production and personal freedom, in capitalist society, workers have personal freedom, but because they have no means of production, they have to sell their labor force to obtain living remuneration. This is a characteristic of the exploitative relationship in capitalist society, which is significantly different from the exploitation without personal

freedom in slave society and feudal society.

In capitalist society, the domination of capitalists over the working class is limited to the means of production. Capitalists provide the means of production for workers to use, and workers receive remuneration to meet the needs of labor force reproduction. The dominant relationship between slave owners and slaves in slave society, on the other hand, was all-encompassing. It not only included the domination of the means of production and the exploitation of labor achievements but also controlled the status of slaves, leaving them with no personal freedom at all, and all labor achievements were occupied by slave owners.

Of course, the production relations in capitalist society are also adapted to the development of productive forces. Different from slave society and feudal society, in capitalist society, due to the rapid development of productive forces and the vitality of commodity transactions, if the slave society or serf system were still used, it would be difficult to adapt to the changes in the mode of production and the mode of commodity trade. In addition, if capitalists controlled the personal freedom of the working class, then during the expansion of reproduction, the change of industry, or the introduction of new technologies, the working class would have to be completely dependent on capitalists due to the restriction of personal freedom, which would undoubtedly hinder the capitalists' needs for expanding reproduction and changing industries. This is also the reason for the emergence of the Enclosure Movement (Dyer, 2006) in Britain. During the Enclosure Movement, capitalists drove away the peasants from the land, resulting in the so-called phenomenon of "sheep devouring men". This was because these peasants did not have the skills to engage in work such as mechanized textile production and were not skilled workers. When capitalists believed that this group of proletarians had no utilitarian value and could not be exploited for surplus value, they would not hesitate to drive them away.

3.6. Contradictions in Capitalist Society

The contradictions in capitalist society are mainly reflected in two key aspects: class contradictions and basic contradictions.

The class contradictions in capitalist society are intuitively manifested as the opposition between capitalists and the proletariat. This contradiction has existed continuously with the development process of capitalist society since its birth. Its root lies in the differences in the system of capital ownership. By virtue of their control over capital, the bourgeoisie firmly seizes the ruling power of capitalist society and dominates the economic operation of the entire society. The working class, on the other hand, can only passively sell their labor force, and their living conditions are extremely unstable. In the tide of social changes such as technological revolutions, some members of the proletariat may face the risk of unemployment; factors such as personal health problems may also push them into poverty.

In developed modern capitalist societies, due to the continuous improvement of the social welfare security system, the contradictions between the bourgeoisie and the proletariat have been alleviated to a certain extent. However, this alleviation is often superficial, and the contradictions can easily be transferred to poor and backward third-world countries. In these countries, due to the lack of a welfare security system for the proletariat similar to that in developed countries, class contradictions are often more acute. When the proletariat cannot meet their basic survival needs, social unrest may be triggered. For example, in the late Qin Dynasty of China, Chen Sheng and Wu Guang were conscripted to build the Great Wall in the north, but they were delayed by rain. Facing the desperate situation of being executed whether they went or not, they had no choice but to rise up in rebellion, triggering the surging peasant uprisings at the end of the Qin Dynasty, which eventually overthrew the regime of the Qin Dynasty. Similar cases are also common in many underdeveloped countries today. In the early 21st century, severe social unrest occurred in some countries in North Africa and the Middle East (Saidin, 2018).

The basic contradiction of capitalism is the contradiction between the socialized large-scale production and the capitalist private ownership system. Even in modern capitalist society, this basic contradiction still exists. However, with the continuous emergence of new technologies, the continuous updating of information technology, and the vigorous development of Internet technology and

artificial intelligence technology, this contradiction has been concealed to a certain extent.

The emergence of these emerging information technologies has promoted the capitalist societies of developed countries and alleviated their internal basic contradictions to a certain extent. The emergence of new technologies has stimulated the vitality of investment behavior, and various application scenarios have continued to emerge, covering up the problem of overproduction of products caused by socialized large-scale production. For example, in developed capitalist countries, excess products may find a market through channels such as Internet self-media. However, we must clearly recognize that these new technologies are usually only widely applied in developed capitalist countries. In poor countries, the dumping of products by developed capitalist countries leads to the transfer of a large amount of basic resources to developed countries, forming a huge trade deficit with developed countries. This situation can easily lead to problems such as resource scarcity in underdeveloped countries due to the continuous outflow of resources, thereby triggering social unrest and restricting national development. At the same time, in the context of the continuous development of information technology, a so-called "information gap" has been formed between developed countries and underdeveloped countries, which further exacerbates the difficulties of underdeveloped countries in economic development.

At present, under the condition of new technologies, various financial crises have broken out around the world many times, such as the Internet bubble burst crisis in 2000 (Arestis & Karakitsos, 2010) and the financial crisis in 2008 (Rose & Spiegel, 2012). The outbreak of these financial crises is closely related to the concentrated outbreak of the basic contradictions of capitalism within modern developed capitalist countries.

References

[1] Arestis, P., & Karakitsos, E. (2010). The Causes and Consequences of the Internet Bubble. In The Post 'Great Recession' US Economy: Implications for Financial Markets and the Economy (pp. 23-40). London: Palgrave Macmillan UK.

[2] Brecht, B. (2015). Life of Galileo. Bloomsbury Publishing.

[3] Chang, M. H. (1996). The Thought of Deng Xiaoping. Communist and Post-Communist Studies, 29(4), 377-394.

[4] Dyer, C. (2006). Conflict in the Landscape: The Enclosure Movement in England, 1220-1349. Landscape History, 28(1), 21-33.

[5] Lefebvre, H. (2009). Dialectical Materialism. University of Minnesota Press.

[6] Marx, K. (2004). 马克思: 资本论 第一卷(Chinese Edition). 中共中央编译局译, 第 2 版. 北京: 人民出版社.

[7] Maslow, A., & Lewis, K. J. (1987). Maslow's Hierarchy of Needs. Salenger Incorporated, 14(17), 987-990. https://researchhistory.org/2012/06/16/maslows-hierarchy-of-needs/?print=1

[8] Maybee, J. E. (2016). Hegel's Dialectics. Stanford Encyclopedia of Philosophy. https://plato.stanford.edu/ENTRIES/hegel-dialectics/

[9] Rabin, S. (2004). Nicolaus Copernicus. https://plato.stanford.edu/entries/copernicus/?fbclid=IwAR1_d8lC57wCvBKr0uBPWg95WxoMSb01f46mgunVYXzAy8uzV1JuPnKQTNU

[10] Ricardo, D. (1955). The Works and Correspondence of David Ricardo: Volume 10, Biographical Miscellany (Vol. 10). Cambridge University Press.

[11] Rose, A. K., & Spiegel, M. M. (2012). Cross-Country Causes and Consequences of the 2008 Crisis: Early Warning. Japan and the World Economy, 24(1), 1-16.

[12] Rowland, I. D. (2009). Giordano Bruno: Philosopher/Heretic. University of Chicago Press.

[13] Saidin, M. I. S. (2018). Rethinking the 'Arab Spring': The Root Causes of the Tunisian Jasmine Revolution and Egyptian January 25 Revolution. International

Journal of Islamic Thought, 13, 69-79.

[14] Singh, V. B. (1959). Adam Smith's Theory of Economic Development. Science & Society, 107-132.

[15] Smith, A. (1987). The Essential Adam Smith. WW Norton & Company.

[16] Taylor, C. (1978). Feuerbach and Roots of Materialism. Political Studies, 26(3), 417-421.

[17] Thomas, P. (2008). Marxism & Scientific Socialism: From Engels to Althusser. Routledge.

[18] Tian, P. Y. (田培炎) (2025). 把握马克思主义的七大生命力(深入学习贯彻习近平新时代中国特色社会主义思想). 人民日报. 2025 年 09 月 12 日 09 版. http://opinion.people.com.cn/n1/2025/0912/c1003-40562149.html

[19] Vieira, F. (2010). The Concept of Utopia. The Cambridge Companion to Utopian Literature, 3, 27.

[20] Wilson, I. (1989). Socialism with Chinese Characteristics: China and the Theory of the Initial Stage of Socialism. Politics, 24(1), 77-84.

Chapter 4. The Rise and Fall of Capitalism

4.1. Prehistoric Capitalism

From existing archaeological discoveries, the society of the Liangzhu Ancient City era (Cheng, 2024) may be the earliest known social form with capitalist characteristics. The Liangzhu Ancient City era dates back approximately 5,300 to 4,300 years ago and lasted for nearly 1,000 years; during this period, although the Liangzhu Ancient City experienced several ups and downs, the overall social order remained relatively stable. Based on archaeological evidence, it can be inferred that the social development of the Liangzhu Ancient City went through an evolutionary process from a primitive agricultural society to a highly developed capitalist society.

The development context of the Liangzhu Ancient City society can be traced back to the Xianrendong Site in Shangrao, Jiangxi Province, which was inhabited 20,000 years ago (Wu, Zhang, Bar-Yosef, et al., 2012). At this site, archaeologists discovered the world's earliest pottery jars, indicating that humans 20,000 years ago had mastered the technique of hand-made pottery. The emergence of pottery jars marked a leap forward in human civilization: just as the use of fire allowed humans to break away from ancient apes and move towards independent evolution, the birth of pottery-making technology meant that humans embarked on the era of industrial production—producing industrial products through industrial technology, enabling some people to break away from farming and specialize in handicrafts, thus fundamentally transforming the entire social structure. This impact is comparable to the reshaping of human society by the 17th and 18th-century Industrial Revolution; both promoted changes in production and lifestyle through technological innovation, ultimately driving society to a new stage of development.

Subsequent archaeological findings further confirm the rapid development of human society. After the ancient humans at Xianrendong invented pottery jars 20,000 years ago, over the next 10,000 years, archaeologists successively discovered remains of pottery jars dating back more than 10,000 years in the middle and lower reaches of the Yangtze River and other areas (including Hunan, Guangdong, Guangxi and other regions) (Boaretto, Wu & Weiner, 2009). This indicates that pottery-making technology spread widely in southern China after thousands of years, fully conforming to the diffusion law of industrial product production and sales.

By 11,400 years ago, pottery-making technology was introduced to the area of the Shangshan Culture in Zhejiang, and social development entered a new stage. From the pottery jars, production tools and physical remains unearthed at the Shangshan Culture site, it can be seen that ancient humans at that time were able to mass-produce pottery jars with large output, and painted pottery craftsmanship also appeared (Wang & Sebillaud, 2019). More importantly, some unearthed pottery jars have regularly arranged dot and line symbols on their surfaces, whose forms are similar to the expression of modern digital technology. It is inferred that binary counting was mainly used: the presence or absence of "dots" represents "existence" and "non-existence", and the "number of dots" is used to record the output of pottery jars, which is essentially the two basic states of digital technology; more advanced binary counting directly uses two different lines, similar to the symbol forms of "Yin Yao" and "Yang Yao" in *The Book of Changes* (Confucius, Book of Changes).

In addition, evidence of rice domestication was found at the Shangshan Culture site (Huan, Li, Ma, et al., 2014). This indicates that with the emergence of pottery-making technology, humans' ability to transform and utilize natural objects significantly improved—rice domestication means that ancient humans could purposefully select plants and animals suitable for their own nutritional and survival needs, and achieve controllable food sources through artificial sowing and breeding. This progress is directly related to the invention of pottery-making technology: without pottery jars for holding and storing wild rice, it would have been extremely difficult to preserve crop seeds, and rice breeding

would have been impossible.

However, the Shangshan Culture period still belonged to a typical agricultural society. Although there were a small number of industrial products at that time, and the emergence of advanced pottery-making technology and painted pottery also reflected humans' initial artistic thinking and aesthetic ability, it had not yet met the characteristics of a capitalist society as defined by Marx. For example, although pottery jar production had formed a certain scale, the number of hired workers was limited, and these workers had not completely broken away from farming to become the proletariat; from the overall situation of the Shangshan Culture site, there was no class differentiation at that time, and it was still in a relatively primitive self-sufficient agricultural state.

Entering the Kuahuqiao (Jiang, 2013) and Hemudu (Sun, 2013) eras, the types of human industrial products greatly enriched. In addition to the rapid development of pottery-making technology, wood processing technology (focusing on canoe manufacturing (Wu, 2021) and textile machinery (Cameron & Sun, 2022)) also made breakthroughs, and these technologies all extensively used processed wood. The rise of canoe manufacturing workshops and the mass development of textile machinery meant a surge in demand for hired workers—at this time, a large number of people broke away from farming, "washed their feet and left the fields", and focused on the production of canoes and textile tools. Taking canoe manufacturing as an example, it not only required the use of fire and stone tools such as stepped stone adzes (Sun, 2013) to process wood, with high technical requirements, but also the wood used for making canoes needed to be cut from upstream areas with abundant forest resources and transported to places like Hemudu. The workers specializing in logging and transportation also basically broke away from farming and became early hired workers. The employment system had emerged in the Kuahuqiao and Hemudu eras, for example, a canoe repair workshop site was discovered in Kuahuqiao (Pearson, 2025), which required a large number of hired workers to complete the corresponding work.

From archaeological findings, the main equivalent for commodity exchange at that time was stone tools. Although such stone tools had the characteristics of easy preservation, portability and high value, their unearthed mass was

limited and most of them were worn, indicating that their core function was still as production tools. This reflects that commodity exchange at that time was still dominated by the primitive barter system, and the exchange system was relatively backward, still far from a capitalist society.

After another one or two thousand years, entering the Songze Culture (Boaretto, 2012) and Majiabang Culture (Mao & We, 1978) periods, the social form underwent a key transformation. From the cultural relics unearthed at these two major cultural sites, in addition to exquisitely made stone tools such as stone axes and stone battle-axes, jade artifacts with harder materials also appeared (Jin, Liao & Zhou, 2024; Douglas, 2005). These stone tools and jade artifacts were buried with the tomb owners as precious objects, directly reflecting that the tomb owners had a high social status, indicating that obvious class differentiation had emerged at that time (Gao, 2008; Renfrew & Liu, 2018). The essence of class differentiation is the difference in social wealth distribution, which is completely consistent with the logic of "wealth determining status" in capitalist society—just as modern society measures personal wealth by currency and gold, people in the Songze and Majiabang Culture periods demonstrated their wealth through the exquisiteness and scarcity of stone tools and jade artifacts.

From this, two core conclusions can be drawn: first, the emergence of class differentiation means that some people do not need to work and can meet their own needs by occupying the labor fruits of others and exploiting the surplus value of hired workers. By controlling the living capital of hired workers, these people occupy a high position in society, and their role is similar to that of "capitalists" in modern society; second, the existence of the "capitalist" group implies that the scale of hired workers at that time was quite large, which is a typical form of early capitalism in ancient times.

If capitalism in the Songze and Majiabang Culture periods still existed in a decentralized form, then in the Liangzhu Ancient City era (Zhang, 2012), the trend of capital monopoly gradually emerged. During the 1,000-year existence of the Liangzhu Ancient City, a city core area of approximately 3 square kilometers appeared in its late stage—there were no farmlands in the core area, but

there was a huge granary capable of storing 200,000 kilograms of rice (Qin, 2024), and it was also equipped with complete water conservancy facilities; most areas of the core area were rammed and raised using the "straw-wrapped mud" technique (Liang, Yuan & Han, 2019), forming a solid highland. Completing such a large-scale project required a huge amount of human and material resources, and the workers involved in the construction had completely broken away from farming, relying on the basic means of subsistence provided by capitalists for survival. The surplus value generated by their labor was occupied by capitalists, which fully conformed to the core characteristics of a capitalist society.

In addition, the objects used as intermediaries for commodity exchange in the Liangzhu Ancient City had developed from stone tools to exquisitely made jade artifacts (Childs-Johnson, 2019); some jade raw materials needed to be transported from distant regions such as Xinjiang (Liu, 2022), which not only proves that the capitalist trade system at that time was extremely developed, with influence radiating to distant areas, but also reflects the maturity of the trade network. To distinguish the value of jade artifacts, some high-quality jade artifacts (such as jade battle-axes) were specially carved with exquisite divine emblems (Childs-Johnson, 2019)—these divine emblems were like anti-counterfeiting marks on modern banknotes, facilitating users to quickly identify the value of jade artifacts, and at the same time implying that the practical use value of jade artifacts was far lower than their value as exchange intermediaries.

Relying on an advanced water transportation system and a developed currency (jade) system, the scale and population capacity of the Liangzhu Ancient City significantly increased. Based on previous Chapter 2's calculations, the excavated key area of the Liangzhu Ancient City (approximately 8 square kilometers) could accommodate about 100,000 people under the background of fully developed capitalism, and could easily meet the basic living needs of these people. Compared with the estimated population density of ancient civilizations in Central Asia such as Mesopotamia, this estimation is relatively accurate (Liu, 2020).

4.1.1. Currency in the Liangzhu Ancient City

From the definition of currency, currency is the general equivalent for commodity exchange (Marx, 2004, V1, 86-87). The earliest trade of humans was barter, that is, directly exchanging one item for another. For example, after a fisherman caught fish, he exchanged the fish with farmers for grain. This method was relatively primitive, and the exchange quantity was completely determined by the needs of both parties. However, with the continuous development of trade, people found that barter had many inconveniences: when a person accumulated a large amount of a certain type of wealth, they often did not need to exchange for too many similar items. For example, when farmers had a bumper harvest and had more grain than they could eat, they did not want to exchange all their grain for the fisherman's fish. At this time, they preferred to use a valuable and portable item as an intermediary—converting the grain into such an item for storage, and then using it to exchange for other needed goods in the future.

These items with both value preservation and portability were gradually fixed. From the current archaeological excavations, among the items buried with tomb owners, stone tools (such as various jade artifacts, stone axes, etc.) are the most numerous (Boaretto, 2012; Sun, 1993), and there are also utensils such as pottery jars. It can be seen that ancient humans regarded pottery, stone tools and other items as precious objects during exchange, using them to exchange for other commodities. These stone tools naturally became the equivalent for commodity exchange—not only reflecting a certain exchange value, but also serving as an important symbol for humans to demonstrate their identity and wealth.

The role of stone tools and other items as symbols of wealth is also reflected in the development of stone tool production technology. From the tombs of the later excavated Songze Culture and Majiabang Culture sites, in addition to stone axes and other stone tools made of ordinary stone materials, jade artifacts with harder materials also appeared as burial objects. This indicates that by the Songze and Majiabang Culture periods, people had realized that jade artifacts had higher value and could better reflect the wealth and status of the tomb owners during their lifetime.

After entering the Liangzhu Ancient City era, jade-making technology entered the stage of industrialized production. On the outskirts of the Liangzhu Ancient City, there was a concentrated area of specialized jade processing and manufacturing workshops (Wang, 2018), similar to the small commodity markets in Wenzhou and Yiwu today, where a large number of jade-making workshops emerged. The emergence of workshops meant that a large number of workers were needed, and the exquisite jade processing technology indicated that these professional craftsmen had mastered mature jade-making technology through inheritance, forming a complete and complex industrial chain. From archaeological excavations, it is known that some of the raw materials for jade-making in the Liangzhu Ancient City can be traced back to distant regions such as Xinjiang, which is sufficient to prove the prosperity of trade at that time—only based on huge profit demands would merchants transport raw materials from thousands of miles away.

In ancient times, before the Bronze Age and Iron Age, jade was the material most easily chosen by ancient people, which could preserve value and not easily rot. Therefore, we can see that a large number of jade artifacts were processed into portable forms: disc-shaped jade artifacts, small jade ornaments (such as necklaces, bracelets, etc.), which all confirm the important status of jade artifacts in the Liangzhu Ancient City. In addition, the number of jade artifacts buried in large tombs of the Liangzhu Ancient City was extremely large, further indicating that jade artifacts were symbols of wealth at that time, just as modern society measures personal wealth by the amount of money.

From this, a conclusion can be drawn: there was an advanced and developed currency exchange system in the Liangzhu Ancient City era, and jade artifacts were the currency in this system.

The role of jade artifacts as the equivalent for commodity exchange can also be confirmed by their shapes. The jade artifacts unearthed in large tombs of the Liangzhu Ancient City are mostly in the shapes of stone axes, stone battle-axes, discs, etc.; in the later development, coins cast in bronze and other metals (such as the Warring States knife coins (Dickinson, 1862) and Eastern Jin knife coins) were also mostly in the shapes of axes, knives or discs (Johnston, 2022), which

should be the inheritance and development of the shapes of stone battle-axes, jade battle-axes and jade discs at that time.

With jade artifacts as the intermediary for commodity exchange (i.e., currency), many phenomena of the Liangzhu Ancient City can be reasonably explained. For example, the large-scale water conservancy system of the Liangzhu Ancient City required a huge amount of human and material resources even when estimated by modern engineering quantities. To hire so many workers to build the water conservancy system, a large amount of currency was naturally needed—if jade artifacts were the currency at that time, the managers of the Liangzhu Ancient City only needed to pay the workers with jade artifacts, rather than only paying grain. After all, grain could only meet the daily diet and basic family needs of the workers; if they needed to buy more daily necessities, they still had to rely on currency.

4.1.2. Hired Workers in the Liangzhu Ancient City

From the excavated remains of the Liangzhu Ancient City, the number of hired workers required for its large-scale water conservancy system was extremely large. Hiring so many workers to build the water conservancy system required an astonishing amount of wealth; moreover, judging from the scale of the water conservancy project, its construction period was extremely long, and it could not be built only by farmers participating in their leisure time—such projects required professional technology and long-term labor to complete. In addition, the water conservancy project needed continuous maintenance after completion; if it was left unused for a long time, it would quickly collapse due to river erosion. This can be confirmed by the situation in the late period of the Liangzhu Ancient City: during the last two to three hundred years, the ancient city suffered a severe drought, and the water conservancy project was almost abandoned (Zhang, Cheng, Edwards, et al., 2021), which may also have led to the water conservancy system being completely unable to function when floods came later.

In addition to the water conservancy project, there were multiple complete industrial chains in the Liangzhu Ancient City era, among which the canoe manufacturing industry was one. From the canoe manufacturing and maintenance

workshops excavated at sites such as Hemudu and Kuahuqiao (Pearson, 2025; Zhai, Sun & Hu, 2022; Zhang, 2015), it is known that there were a large number of canoe manufacturing and maintenance workshops in this area. To produce canoes that could meet the transportation needs of hundreds of thousands of people in the Liangzhu Ancient City, it was difficult for craftsmen from a single family to complete, so a large number of hired workers were needed; at the same time, other links in the canoe industrial chain also required a large number of hired workers to participate.

Another important industrial chain was the jade manufacturing industry (Wang, 2018). As mentioned earlier, jade artifacts were the currency at that time, and the commodity trade of the Liangzhu Ancient City was prosperous. With the economic development and improvement of living standards of the ancient city, the demand for jade artifacts grew rapidly. The raw materials for jade artifacts needed to be transported from distant regions such as Xinjiang, which not only reflects the large scale of trade at that time, but also indicates that jade-making had high requirements for craftsmanship and precision. Therefore, the number of hired workers in the jade-making workshops around the Liangzhu Ancient City was quite large—these workers no longer engaged in work that directly obtained resources from nature such as farming, and their functions were basically the same as those of workers in modern society.

In addition, the textile manufacturing industry was also very prosperous at that time. From the large number of textile tools excavated at sites such as Hemudu (Cameron & Sun, 2022), it can be seen that the textile industry developed rapidly in those years. Although no specialized textile factories have been found yet, even if textile production did not realize large-scale industrialized production, it was likely carried out by women in family units. This means that the development of the textile industry promoted women to transform from a farming state to hired workers—they no longer needed to work in the fields, but only needed to engage in textile work at home to earn enough income to supplement their families. The scale of this group was extremely large, accounting for about half of the population of the Liangzhu Ancient City, and most of them were female members of families.

It is worth noting that no farmlands were found in the excavated core area (about 3 square kilometers of the inner city) and outer city (about 8 square kilometers) of the Liangzhu Ancient City. According to previous estimates, the 8-square-kilometer urbanized area could accommodate 100,000 people, and these people could hardly produce their own food, drinking water and other daily necessities, so they needed to purchase them from surrounding farmers through trade. This demand also promoted the development of the tertiary industry (service industry) in the city's core area, such as the catering industry and accommodation industry—at that time, there were merchants coming from distant regions such as Xinjiang, and their demand for accommodation promoted the rise of the hotel industry. Judging from the scale of the Liangzhu Ancient City site, the scale of hotels at that time should have been quite large; if we want to restore the living scene at that time, we can refer to the picture depicted in *Along the River During the Qingming Festival* (Chang, 2016)—after all, over thousands of years, many daily utensils and ways of communication among citizens have not changed much.

4.1.3. Rulers of the Liangzhu Ancient City

There must have been rulers in the Liangzhu Ancient City, but whether there was one ruler or multiple rulers can only be inferred from archaeological relics. At present, there are about 11 nobles buried in the Fanshan Tombs in the core area of the Liangzhu Ancient City (Fang & Wang, 2022); their burial forms and burial objects are significantly different from those of the Yaoshan Tombs on the outskirts of the core area (Zhu, 2022). The mainstream view in the archaeological community is that the Yaoshan Tombs are civilian tombs. From the differences between these two tombs, the rulers of the Liangzhu Ancient City may not have been a single person; moreover, there were differences in the quantity and value of the burial objects of the nobles in the Fanshan Tombs, which further indicates that there was a ruling class in the Liangzhu Ancient City era.

Combined with the previous analysis, the capitalist production relations of the Liangzhu Ancient City were relatively mature, so even if these nobles were not "kings" in the traditional sense, they must have been a group that controlled

a large amount of wealth and capital, and could be regarded as "capitalists". They constituted the ruling class of the Liangzhu Ancient City society, controlling the urban planning of the ancient city; they even extended their influence to the middle and lower reaches of the Yangtze River with the Liangzhu Ancient City as the core, realizing the effective allocation and rule of resources in the surrounding areas.

For example, a large number of war traces have been found in the Jiangzhuang Cultural Site in Jiangsu Province, which is hundreds of kilometers away from the Liangzhu Ancient City (Yuan, Pan, Storozum, et al., 2022); to the north of the Liangzhu Ancient City, there was another advanced civilization contemporary with the Liangzhu Civilization—the Dawenkou Civilization (Luan, 2013). Archaeological relics confirm that there were fierce conflicts in the border area between the Liangzhu Civilization and the Dawenkou Civilization (i.e., the Jiangzhuang area), and Jiangzhuang was a defensive zone of the Liangzhu Civilization. Mobilizing a large number of troops to Jiangzhuang to resist the invasion of the Dawenkou Civilization required an efficient government management mechanism. This indicates that the Liangzhu Ancient City had established a "state-like" system with a national defense force and a national defense system; and the ability to mobilize the national defense force also shows that the nobles (or capitalists) of the ancient city had mastered political power.

In addition, the divine emblems on jade artifacts (Childs-Johnson, 2019) are also important evidence. As a totem, the divine emblems were symbols of awe for ordinary people; at the same time, they were also used as "anti-counterfeiting marks" to judge the quality of jade artifacts, which shows that the capitalists of the Liangzhu Ancient City had cultural discourse power—they could convey specific cultural information to ordinary people according to their own will.

4.1.4. Specific Production Relations in the Liangzhu Ancient City

From the excavated sites and the previous analysis, it can be seen that the social form of the Liangzhu Ancient City was dominated by private ownership. For example, there was a large granary in the ancient city that could store 200,000 kilograms of rice. Although it could meet the annual living needs of thousands

of people, the population of the central urban area of the Liangzhu Ancient City was about 100,000, so this granary was not for the entire city, but only for the residents of the core area (about 3 square kilometers) of the ancient city. This phenomenon fully reflects the private ownership characteristics of the Liangzhu Ancient City: a large amount of grain was only owned by the nobles or capitalists in the core area, and other people could not obtain it directly. They could only exchange their labor for currency by selling their labor to capitalists, and then use the currency to buy food and other daily necessities.

In fact, as early as the Songze Culture and Majiabang Culture periods, class differentiation was already very obvious. From the tombs of the Songze Culture site, the difference between noble tombs and civilian tombs was significant (Boaretto, 2012): noble tombs contained a large number of jade artifacts, stone tools, and even animal remains as burial objects, while civilian tombs only had simple items such as pottery jars. This indicates that wealth began to concentrate in the hands of a few people at that time; by the Liangzhu Ancient City era, wealth was almost completely concentrated in the hands of the nobles living in the core area.

The nobles who controlled a large amount of capital could use the capital to buy products produced by surrounding civilians, and also organize civilians to build the water conservancy system of the Liangzhu Ancient City (which was complete and spectacular); at the same time, they also established a national defense force to resist the invasion of the Dawenkou Civilization in the north.

From these characteristics, it can be seen that capitalism in the Liangzhu Ancient City era was quite developed: the trade scope extended to distant regions such as Xinjiang thousands of miles away, and the core industrial chain could meet the manufacturing needs of the middle and lower reaches of the Yangtze River; wealthy capitalists lived in the 3-square-kilometer core area of the ancient city, where life was prosperous and it had functions such as flood control, national defense, and convenient transportation. It can even be said that it had entered the stage of "monopoly capitalism"—the capitalists in the core area almost monopolized the entire trade system and defense system of the Liangzhu Kingdom.

4.1.5. The Decline of Prehistoric Capitalism

Unlike the later capitalism, which was mainly overthrown by man-made reasons and thus declined, the capitalist society of the prehistoric Liangzhu Ancient City era declined mainly due to natural disasters. Of course, before the arrival of natural disasters, the Liangzhu Ancient City civilization had already experienced extremely serious wealth gap problems. The contradiction between the wealthy class and the poor common people and the proletariat was quite acute, which can be seen from the fact that the wealthy class had to live in the core area of the Liangzhu Ancient City of about 3 square kilometers.

The wealthy capitalists and nobles chose to live in the relatively small core area to isolate themselves from the common people in the outer areas, avoid too close contact between the two sides, and thus prevent direct face-to-face conflicts. With the development of this capitalist society, the scale of the proletariat continued to expand. A large number of proletarians began to spread to the surrounding areas of the city, and to the north, there was the Dawenkou Civilization. Although the Dawenkou society was not as developed as the "capitalist" society of the Liangzhu Ancient City, due to its smaller population, when homeless common people could not survive in the Liangzhu Ancient City society, they might continue to spread to the Dawenkou Civilization area. However, the organizational form and social structure of the Dawenkou society were completely different from those of the Liangzhu Ancient City society, which directly led to positive and fierce conflicts between the Dawenkou Civilization and the Liangzhu Ancient City Civilization, forcing the Liangzhu Ancient City Civilization society to form its own national defense force, which was stationed in the Jiangzhuang Site area in Jiangsu Province.

However, the conflicts with the Dawenkou Civilization were not enough to cause the decline and collapse of the entire capitalist society of the Liangzhu Ancient City. From the existing archaeological findings, both the Liangzhu Ancient City Civilization and the Dawenkou Civilization lasted for nearly 1,000 years. That is to say, during this 1,000-year historical process, except for occasional conflicts in the border areas, the two civilizations could still maintain

normal exchanges, and there was no situation where one civilization attempted to invade and replace the other.

The real cause of the decline of the capitalist society of the Liangzhu Ancient City was a sudden large-scale flood. This flood occurred approximately 4,200 to 4,300 years ago. From the existing archaeological and geological archaeological researches (Zhang, Zheng, Meadows, et al., 2022; Wu, Zhu, Song, et al., 2017), it is known that 4,300 years ago, the Liangzhu Ancient City area was submerged by seawater about 100 meters deep for a long time, lasting for decades. This long-term submersion caused a devastating blow to the Liangzhu Ancient City Civilization, and of course, also to the Dawenkou Civilization in the north. This also led to a gap of hundreds to thousands of years in the development of human civilization history. Archaeological excavations in many places even show signs of civilizational regression: the various pottery, jade artifacts and other cultural, artistic and industrial products excavated from the sites before 4,300 years ago were extremely advanced, but after 4,300 years, although some civilizations still existed, the pottery and other items excavated from these civilization sites were significantly less advanced than those from the Liangzhu Culture and Dawenkou Culture sites before 4,300 years ago. The Xiaogu Ancient City Site, which was excavated in Yuhang District, Zhejiang Province and dates back 3,000 years ago (Zhang, Wang, Fan, et al., 2023), is in the late Shang Dynasty, with an area of only 250,000 square meters, which is only 1/20 of the core area of the Liangzhu Ancient City. It can be seen that the social development of this area was very slow for 1,000 years after the flood.

There is no doubt that this flood was an extremely large-scale one, and there is a lot of archaeological and geological evidence to confirm this. This flood may be related to the large number of glacial lakes formed after the end of the Last Glacial Maximum 19,000 years ago. After the end of the Last Glacial Maximum, a large amount of glaciers on the Qinghai-Xizang Plateau melted. For thousands of years, this melted water did not flow into the sea immediately, but accumulated in some depressions on the Qinghai-Xizang Plateau. For example, the Tarim Basin, Qaidam Basin, Sichuan Basin and other large and small basins that we can see on the map today can all store a large amount of glacial meltwater. If

the Earth cools down, this glacial meltwater will re-freeze into glaciers; if the global temperature continues to rise or remains at the current level, this glacial meltwater will continue to erode the dam of the glacial lake. Once the dam of the glacial lake bursts, a large amount of lake water will flow into the middle and lower reaches of the Yangtze River and the North China Plain, which are at lower altitudes, thus forming extremely large floods in these areas. At present, from the Chinese map, we can see that there is a very broad Hexi Corridor from the Tarim Basin to the North China Plain and the middle and lower reaches of the Yangtze River (Li & Yang, 1998). It is believed that this corridor may be the direction of the water flow after the glacial lake dam burst at that time. Combined with the laws of tsunami movement such as Seiche (tidal resonance), it may have caused flood submersion in a certain area for decades, which may be the fundamental reason for the decline of the "capitalist" society of the Liangzhu Ancient City.

4.2. Capitalism in the Shang Dynasty

The ancient city of Liangzhu and the Dawenkou civilization were submerged in a sudden massive flood, with backflowing seawater continuously soaking them for decades. The civilization that humans gradually developed over 16,000 years abruptly came to a halt around 4,300 years ago, encountering a severe interruption. The ancient humans who ultimately survived the flood mostly lacked the sophisticated survival skills possessed by the Liangzhu and Dawenkou civilizations at the time. Liangzhu's capitalist society was highly advanced, with a complex industrial chain and intricate social and economic structures. As a result, once the entire civilization was engulfed by the flood, it was difficult to quickly rebuild elsewhere.

After the floodwaters receded, the remaining ancient humans reestablished a new human government in relatively high-altitude areas such as Erlitou, which may have been the ancient Chinese Xia Dynasty (Sturgeon, 2019). Because the Xia Dynasty was established in response to this large-scale flood disaster, the regime had certain provisional characteristics. In other words, its governmental organization was primarily designed to handle flood disasters, meaning that the

organization of the government, as well as social and economic structures, revolved around preventing future floods and ensuring human survival after disasters. Consequently, the government paid relatively little attention to economic development. In fact, during the reign of Kong Jia, the Xia Dynasty had already seen numerous instances of vassals rebelling. By the time of King Jie, he even compared himself to the sun, demanding that everyone else depend on him. His governing style was simple and crude, which caused dissatisfaction among the vassals and officials, ultimately leading to widespread defection and abandonment.

For any society, if economic development is neglected, productivity naturally remains low. According to Marx's philosophy, material conditions determine consciousness; without sufficient development of productivity, production relations remain relatively primitive and underdeveloped. Enforcing production relations that exceed the level of productivity, on the contrary, brings instability to society. Conversely, if productivity has developed to an unprecedented level while production relations remain primitive, it also leads to social instability, as the production relations cannot accommodate the development of productivity.

During the Xia Dynasty, a very powerful force emerged: the so-called Shang tribes (Sturgeon, 2019,1), who were the ancestors of those later establishing the Shang Dynasty. According to historical records, these Shang tribes differed from other tribes in their expertise in commerce. The leader of the Shang tribes was Wang Hai (Chang, 1995), who was highly skilled in business and capable of effectively allocating various resources, earning the attention of the Xia rulers as it brought some economic benefits. However, the core purpose of Xia's rule was coping with flood disasters, and economic development remained insufficiently emphasized, seriously affecting the daily lives of many common people. Under such circumstances, during the reign of Shang Tang, the Shang tribes launched an uprising and established a new dynasty—the Shang Dynasty.

Since the Shang Dynasty was established by Shang tribes skilled in commerce, they employed many workers, which in a sense could be seen as capitalists. This

indicates that the Shang Dynasty was the ancient Chinese dynasty founded by a group resembling capitalists. Because the Shang rulers were skilled in business, the dynasty placed a significant emphasis on economic development. This economic model continued into later periods, playing a pioneering role in the commercial development of subsequent Chinese dynasties.

The earliest recorded writings on merchants (businesspeople)—the "Records of the Grand Historian" (Shiji), specifically the "Biographies of Merchants and Traders" (Huozhi) (Sturgeon, 2019,2)—suggest that merchants in the Yin-Shang period conducted business in a completely free economic manner, without government regulation. However, according to Marx's theory of capital, capital carries an original sin that perpetually gives rise to the proletariat. Furthermore, capitalists, in pursuit of high profits, may act unscrupulously. Therefore, in a fully laissez-faire market environment like the Shang Dynasty, where merchants held a dominant position, national governance inevitably became highly permissive. The early capitals of the Shang Dynasty were constantly relocated, much like merchants moving for business, until in the mid-to-late Shang period, they gradually settled in what is now Shangqiu, Henan Province, corresponding to the present-day Yin Ruins (Tang, 2008).

From the currently excavated Yin Ruins, the total area of the site is about 30 square kilometers, with the core city and buffer zone roughly covering 4 square kilometers and 13 square kilometers, respectively. In terms of the area of the core city ruins, it is comparable to the inner and outer city areas of the Liangzhu Ancient City. This means that during the peak of the Yin-Shang period, it basically approached the prosperous level of the Liangzhu Ancient City. However, if the transportation facilities are considered, and the water systems surrounding the Liangzhu Ancient City are included, the effectively managed area of Liangzhu Ancient City could reach around 100 square kilometers (Wang & Liu, 2015), which is much larger than the area during the peak of the Yin-Shang period (Li, Wang, Lang, et al., 2022). This suggests that the capitalist society of Liangzhu Ancient City may have been more developed than that of the Shang Dynasty. This may be due to differences in the duration of development. After all, the Liangzhu civilization developed over more than 10,000 years, from the creation

of the first pottery in Xianrendong Cave, Jiangxi, about 20,000 years ago, to the Liangzhu Ancient City period, whereas the Shang Dynasty, from the great flood to its peak, lasted only a few hundred years. Naturally, the restored cities could not match the Liangzhu Ancient City in terms of technological advancement and completeness of transportation infrastructure. Research on the capitalist system of the Shang Dynasty in the past, due to a lack of materials, primarily relied on the "Annals of Yin" in the Records of the Grand Historian (Shiji) (Sturgeon, 2019,1). At that time, the "Annals of Yin" were mainly written according to Confucian traditions, mostly describing the behaviors of rulers, with very little coverage of the lives of ordinary Shang people or the specifics of commodity exchanges. However, in recent decades, with numerous new archaeological discoveries, the deciphering of oracle bones (Eno, 2009), and the compilation and study of other archaeological data, we now have a deeper understanding of the development of Shang capitalism. Therefore, conclusions drawn today based on such abundant materials are naturally more reliable.

4.2.1. Currency of the Shang Dynasty

Influenced by the Liangzhu culture, jade continued to be widely used during the Shang Dynasty. A large number of jade artifacts from the Shang Dynasty have been discovered in numerous excavated tombs (Łakomska, 2012; Wang, Wang & Tang, 2018). These jade pieces were not only found in the tombs of nobles but also in the graves of commoners, indicating that jade served as a relatively common form of currency at the time. However, after the destruction of the ancient Liangzhu city civilization, some jade processing techniques may have been lost, making jade craftsmanship more difficult and leading to the absence of the large industrial chains that had previously existed. It is also possible that the scale of commerce in the Shang Dynasty had expanded, and existing jade and other materials were insufficient to meet the demands of trade. Therefore, Shang merchants also used a cheaper exchange medium—shells (Hozumi, 1954; Alexander, 1885). In the excavated tomb of Fuhao (Zhu, 2023; Ball & Levey, 2006), there were thousands of shells (Tan, 2016). Moreover, these shells have also been widely found in tombs of the same period at the Sanxingdui site, which is far from the Yin Ruins (Zhang & Wu, 2024), providing evidence of close trade

relations between the Shang Dynasty and the Sanxingdui civilization at that time. However, these shells were found only in the early period of the Sanxingdui culture and later disappeared, suggesting that such trade gradually ceased in the later period of the Sanxingdui civilization, which may have contributed to its gradual decline. In addition to the discovery of large numbers of shells in tombs as important evidence of their use as currency, we can also find corroboration from the symbols engraved on many bronze ding vessels (interpreted through oracle bone script). These bronze dings were marked with their value during casting; for example, a certain bronze ding received a reward of 5 Peng (50 shells) (Ye, 2001), which was clearly indicated on the vessel. Furthermore, inscriptions show that when Shang kings rewarded their ministers, shells were often used directly (Wang, 2020), indicating that shells were a symbol of wealth and reflecting their important role as currency. As currency, they needed to possess a degree of scarcity. Current research shows that most of these shells originated from the Indian Ocean. The transportation of these shells to the Shang capital must have been extremely arduous, naturally increasing their value.

4.2.2. Hired Laborers of the Shang Dynasty

The Shang Dynasty was a dynasty that frequently expanded externally and often launched wars to acquire a large number of slaves. Some of these slaves were used as laborers to extract their surplus value, while others might have been used by nobles as human sacrifices (Bulling, 1977). However, due to the rapid economic development of the Shang Dynasty and the need to constantly promote its economy through foreign trade, by the middle and late periods of the Shang Dynasty, the dynasty was largely in a relatively peaceful era, cutting off the source of slaves. Under these circumstances, the ruling class of the Shang Dynasty could only acquire a very small number of slaves, primarily for funerary sacrifices of nobles (Shelach, 1996), with many tombs opting to use animals instead for sacrifices (Yuan & Flad, 2005), while most labor was done by hired workers. This form of employment became commonly adopted in subsequent dynasties, especially during the Spring and Autumn and Warring States periods. Of course, in historical texts, these individuals were all referred to as slave servants in Chinese, but these slave servants were very different from the concept of

slaves described in modern literature. These slave servants had personal freedom, and some could even develop into new capitalists after working hard and accumulating sufficient wealth. The Records of the Grand Historian (Shiji), in the Biographies of Merchants and Traders section, records that during the Spring and Autumn and Warring States periods, different slave servants (i.e., hired workers) had different treatment. Some capitalist employers' workers or slave servants had high status, even able to ride horses, travel in carriages, and wear luxurious clothing to meet dignitaries; whereas other slave servants under different capitalists were of lower status and looked down upon. This clearly demonstrates the differentiated status of hired workers and, importantly, reflects that these hired workers had personal freedom.

We believe that Shang Dynasty capitalists needed to hire a large number of laborers primarily because the technology of the Shang Dynasty, especially bronze technology, far surpassed that of the Liangzhu ancient city period. Although the jade processing technology of the Liangzhu ancient city was far more advanced than that of the Yin Ruins site of the Shang Dynasty, in terms of bronze smelting and other metal smelting techniques, the Shang Dynasty created entirely new industrial chains, which required a number of hired workers not less than those in the jade processing industry of Liangzhu. Additionally, current archaeological findings show that many of the jades excavated at the Yin Ruins originated from the Xinjiang region (Gan, 2013; Palo, 2013), indicating that after the destruction of the Liangzhu civilization, the jade trade route from Xinjiang to the eastern coastal areas had been reestablished.

Besides bronze smelting, the pottery industry chains and textile technology industry chains that emerged during the Liangzhu period gradually recovered and even expanded in scale. In addition to these existing industry chains, new industry chains appeared, such as bronze casting and cultural and artistic performances, all requiring a substantial number of hired workers, which undoubtedly greatly promoted the development of capitalism throughout the Shang Dynasty.

Regarding the size of the Shang army, it was around 30,000 to 50,000 soldiers (Dong, 2000). Estimating based on one person per household going to the army

and each household consisting of five people, the population of the capital during the Shang Dynasty was over 150,000. Some authors also estimated this based on the size of central cemeteries discovered (He, 2020). With such a population living within an area of just over ten square kilometers, corresponding service industries were indispensable, and naturally, the number of hired workers engaged in these service industries was also very high.

4.2.3. The Rule of the Bourgeoisie in the Shang Dynasty

The Shang Dynasty (Sturgeon, 2019,1; Hu & Hu, 2019) is an ancient dynasty that shines brightly in the long history of China. From its very establishment, it seemed to be enveloped in a unique commercial aura. One view holds that the name "Shang" originates from the tribe's proficiency in commerce. This is confirmed by the story of Wang Hai, the ancestor of the Shang tribe, engaging in trade as recorded in the "Records of the Grand Historian—Biographies of Merchants and Traders" (Sturgeon, 2019,2). In this land, the rulers exhibited characteristics similar to "capitalists" from the founding of the state, initiating a distinctive chapter of governance. These "capitalist" rulers, after assuming supreme power, did not abandon their profit-seeking nature; on the contrary, they leveraged their status as national leaders to acquire enormous capital more conveniently and efficiently, casting a "capitalist" shadow over the Shang Dynasty from its beginning to its end (Liu, 2009). Moreover, the later term "Yin" in "Yin Shang" in Chinese conveys the meaning of wealth, indicating that the Shang Dynasty was very prosperous. According to oracle bone script interpretations, the character "Yin" also implies a talent for song and dance, reflecting that the Shang Dynasty was a society with highly developed cultural and artistic life.

In ruling the Shang Dynasty, capitalists extended the reach of power like a spider's web into every corner of the state. On the positive side, they actively built centralized market spaces across the country. The Jin Dynasty historian Huangfu Mi recorded in "Chronicles of Emperors" that in the palace constructed by King Zhou, "there were nine markets inside the palace, with carts selling wine and horses selling roasted meat" (Huang, 2010). This means that those indulging in pleasures within King Zhou's palace had to purchase needed

items from palace shops themselves. In contrast, the Beijing Forbidden City in Qing Dynasty did not have such shops. Additionally, the "Collected Oracle Bones, No. 10976" records a detail: on the day Wuyin, a diviner named "Nei" asked for divination, whether the Shang king should order the minister "Que" to buy some items, or not ("Wuyin divination, Nei, buy by Que? not buy by Que?"). This small episode vividly reflects that even within the governmental departments of Shang rulers, there was a significant demand for procurement, showing that the market activity in the Shang capital was comparable to modern society.

In fact, Shang trade markets were not limited to the capital's core areas. According to various historical records, markets were scattered throughout the entire Shang territory. The region functioned like a huge commercial magnet, attracting traders from all corners of the country. They gathered in the Shang capital to freely trade their products through centralized marketplaces, making Shang a flourishing hub of commercial exchange.

The capitalist nature of pursuing capital and enthusiasm for business in the Shang Dynasty even persisted after its fall. In order to pacify the remaining Shang populace, the Zhou Dynasty rulers designated specific areas allowing them to continue business activities more smoothly (Song, 2009). Clearly, the concept of doing business and pursuing capital was deeply ingrained in the rulers, common people, and nobility of the Shang Dynasty. Even after the state was destroyed, they could not abandon their trading instincts, and the commercial gene was passed down through generations.

The rulers of the Shang Dynasty were remarkably thorough in their pursuit of capital, with their influence permeating every aspect of the state. Business transactions, of course, were significant, but even in the development of technology and manufacturing, the nature of trade was closely intertwined. Take the casting of bronze ding vessels as an example: the money spent on casting each bronze ding was meticulously recorded using oracle bone script symbols, as if each item carried commercial value. In the relationships between monarchs and ministers, money also became an important measure of affection and merit. For

ministers who achieved significant accomplishments, mere verbal praise was clearly insufficient; rulers often directly rewarded them with shells or other forms of currency. For generals like Fuhao, who achieved remarkable military success, large quantities of shells were found in her tomb, believed to be the generous rewards of the king. This demonstrates the significant role of money in political relationships at the time.

The rule of the Shang Dynasty capitalists was also deeply reflected in their control of cultural and artistic aspects. Shang religious ceremonies were highly developed, closely linked to the uncertainties of business. In the waves of commerce, making or losing money was as unpredictable as the weather, full of unknowns and fluctuations. To seek psychological balance, people conducted specialized rituals. Initially, these rituals centered around business, praying for prosperous trade and abundant wealth. Later, the reach of the rituals gradually extended to agriculture, praying for stable weather and favorable conditions, and to the military, praying for invincible forces and victorious armies. Regardless of the extensions, the connection between rituals and commerce remained the closest.

This inevitably brings to mind the merchants of modern Shanxi, China, known as "Jin Merchants." When conducting business, they would perform worship ceremonies using figures like Guan Yu, hoping that he would protect their business and ensure profitable returns. Rituals, as a unique cultural practice, are unparalleled in the animal kingdom. They not only unite participants, creating a strong sense of cohesion, but also provide psychological calm and comfort, alleviating the anxiety caused by the uncertainties of commercial activities.

Ritual activities gave rise to brilliant cultural achievements such as oracle bone script and performing arts, which had a profound impact on human civilization and the lives of ordinary people. As a dynasty effectively governed by capitalists, the Shang Dynasty elevated spontaneously occurring folk rituals to the national level, reflecting the strong control that capitalists exerted over culture and art. Moreover, relevant technologies emerged to meet the needs of rituals and other activities. For example, large sets of bronze bells were invented

during the Shang Dynasty, significantly promoting the development of musical instruments in later Chinese history (Zhang, 2017). This demonstrates that the Shang Dynasty's art and music had reached a remarkably high level.

The control of culture and art by the capitalists in the Shang Dynasty became extremely deep, to the point where they blurred the boundaries between art and reality. According to the Records of the Grand Historian, the last ruler of the Shang Dynasty, King Zhou, in order to satisfy the demands of a luxurious lifestyle, spared no effort in constructing grand entertainment palaces. There, large numbers of naked men and women engaged in games and revelry in pools of wine and forests of meat, enjoying themselves through the night. For some ministers he disliked, he used horrifying tortures such as chest dissection and heart extraction to assert his authority. This blending of luxury and brutality in performative acts undoubtedly provoked extreme anger among officials and ordinary people, becoming one of the key factors leading to the overthrow of Shang rule.

4.2.4. The Production Relations of the Shang Dynasty

The Shang Dynasty, as a crucial dynasty in the early development of the Chinese state that clearly established private ownership, has its institutional structure and economic forms deeply imprinted with the distinctive marks of private ownership. Among these, the system of hereditary monarchy represented a typical feature of private ownership in this dynasty and held symbolic significance in the long evolution of early state political systems.

1. Succession to the Throne: The Shift from Abdication to Heredity in Private Ownership

Looking back at the founding stage of the Xia Dynasty, during the exploration of early state governance models, at least the first few rulers practiced the principle of meritocratic abdication (Sturgeon, 2019). This institutional arrangement reflected the pursuit of public interest and capable governance at the time, with rulers prioritizing state affairs over personal power, voluntarily bestowing power upon virtuous and talented individuals, aiming to achieve national

stability and development through the guidance of capable people. The abdication system, as a political succession method, highlighted early society's esteem for fairness, justice, and public spirit, and was an important manifestation of early political civilization.

However, by the time of the Shang Dynasty, the system of royal succession underwent a fundamental transformation. The Shang Dynasty completely abolished the abdication system and established hereditary succession as the core rule for transferring the throne. This change was not accidental but closely related to the development of private ownership. Under the concept of private ownership, family interests and the inheritance of property became important considerations, and the throne, as a symbol of the highest state power, was also regarded as part of the family's private property. Limiting succession to the throne within the family aimed to ensure the stable continuation of power and wealth, thereby maintaining the ruling status of the family. At a deeper level, this is consistent with the behavior of capitalists passing down property to the next generation to preserve family economic interests and social status, reflecting the private ownership system's emphasis on protecting family property and valuing the transmission of power and wealth.

2. Economic Domain: Land and Product Ownership under Private Property

In the economic system of the Shang Dynasty, private property also held a dominant position, specifically reflected in the land system and the ownership of products.

Although a certain proto-form of the well-field system (Zhu, 2024) existed during the Shang Dynasty, in the actual agricultural production structure, land privatization was extremely common. Most of the land was concentrated in the hands of landlords (clan tribes). While peasants engaged in farming, their land use and income distribution were strictly controlled by the landlords (Wang, 2019). This private land ownership created complex interest relations in agricultural production, with landlords deriving economic benefits from land possession, while peasants were to some extent dependent on the landlords for

production.

In the field of commodity trading, the characteristics of private property were even more prominent. Various products, goods, and the results of labor production were clearly owned by individuals. This absolute control over property by individuals led to the emergence of money as a general equivalent. The creation of money was an inevitable result of the development of a private property economy, providing a unified measure for the valuation, exchange, and circulation of personal property, greatly promoting the development of commodity trade and the prosperity of the market. The establishment of a monetary system further reinforced the economic foundation of private property, allowing the commodity economy to operate within a more standardized and efficient framework.

3. The Slave Class: Marginal Status in the Shang Dynasty Economy

At the founding of the Shang Dynasty, there was a military need for external expansion and territorial development. During wars, the Shang captured a large number of prisoners of war, who became slaves. Their personal freedom was strictly restricted, and they were forced to work for their masters in various tasks, especially in production. However, according to existing literary sources and archaeological findings, slaves at the founding of the Shang Dynasty did not play a decisive role in the economic development of the dynasty (Huang, 1980).

This contrasts significantly with the typical slave society described by Marx. In Marx's theoretical framework, slaves were the main force in production, performing almost all productive labor in a slave society. In the Shang Dynasty, however, the situation was different. The ruling class and some ordinary people had already been actively engaged in commercial activities during the Xia Dynasty, and they were skilled in hiring workers and laborers for production. With their advanced commercial concepts and business strategies, they achieved remarkable success in trade. Therefore, at the founding of the Shang Dynasty, the main body of productive labor was not slaves, but ordinary commoners.

Slaves, having completely lost personal freedom, lacked opportunities to acquire professional production knowledge and skills, making it difficult for them

to master complex production techniques and ensure product quality. In industries requiring highly specialized knowledge and skills, slaves were incapable, and thus occupied a marginal position in the production chain, contributing very little to the economic development of the Shang Dynasty. Additionally, from the sixteen human sacrifices found in Fuhao's tomb, it can be seen that they were Aryans, not citizens of the Shang, indicating that most slaves used in burial rituals were prisoners of war (Tan, 2021; Yang & Gao, 2003).

4. Class Differentiation: The Wealth Gap and Social Conflicts under Capital Expansion

With the continuous development of the Shang Dynasty's economy, the accumulation and expansion of capital became a prominent trend. Wealth gradually concentrated in the hands of a few powerful capitalists. For example, before the Zhou Dynasty overthrew the Shang Dynasty, they were merely a tribe in a remote region of the Shang realm. However, during the ongoing development of capitalism throughout the Shang Dynasty, the Zhou tribe constantly annexed smaller neighboring tribes, ultimately causing concern for the Shang emperor, who had the Zhou tribal leader Ji Li killed to curb the expansion of the Zhou tribe (Sturgeon, 2019,3). This demonstrates that the expansion and acquisition of capital during the Shang Dynasty were intense and ruthless. Members of the royal family, leveraging their political privileges and economic advantages, occupied the majority of wealth. This concentration of wealth profoundly altered the social class structure, as a large number of workers, hired laborers, and weaker capitalists gradually lost their property, becoming part of the proletarian class.

In the later period of the Shang Dynasty, the wealth gap widened rapidly, forming a stark class contrast. The bourgeoisie, relying on their wealth and power, held a dominant position in society, enjoying abundant material resources and social privileges, while the proletariat faced poverty and unemployment, struggling in daily life. The intensification of class differentiation heightened the conflict between the bourgeoisie and the proletariat, becoming a major source of social instability.

Those proletarians who lost their assets were partly forced to become hired

laborers for the capitalists, engaging in strenuous work under exploitation while receiving only meager wages. Capitalists maximized their wealth by extending working hours and reducing wages, arbitrarily extracting the surplus value from employees. The other portion of the proletariat, if unable even to secure employment, was left to wander to remote lands, cultivate marginal fields, and live a self-sufficient agrarian life.

However, in the context of rapid capitalist economic development and continuous technological progress, human demands for nutrition and quality of life were increasingly rising. From a thermodynamic perspective, societal "temperature" (understood as the vitality and demand level of social development) was also increasing rapidly. In this situation, relying solely on land to obtain resources became increasingly difficult. Land yield was limited and could not meet the growing needs of the population, especially for the proletariat under survival pressure, as land resources could not provide sufficient support. This intensified social contradictions and escalated class conflicts.

4.2.5. The Fall of Capitalism in the Shang Dynasty

Traditional historical records often attribute the downfall of the Shang Dynasty to King Zhou's lustfulness and tyranny, suggesting that his various misdeeds provoked public anger, ultimately leading to betrayal by both insiders and allies and the collapse of the dynasty. From the historical accounts of King Wu of Zhou's campaign against King Zhou (Shang), it seems that King Zhou's oppressive rule was indeed a major catalyst for the Shang Dynasty's demise. King Wu launched his uprising under the slogans of "mourning the people and punishing the guilty" and "eliminating the tyrant," gaining the moral high ground in public opinion and widespread support. This indirectly reflects that King Zhou's rule had severely violated public opinion and made him a target of widespread resentment.

However, when analyzed from the perspective of social class conflict and societal structure within the Shang Dynasty, it becomes apparent that deep-seated contradictions had already emerged amid the rapid development of "capitalism" in that society.

1. Class Conflict: Social Fractures under Unequal Wealth Distribution

In Shang society, power and wealth were highly concentrated at the top. A small number of powerful capitalists, represented by the royal family, controlled both state political power and large amounts of economic resources, holding the vast majority of societal wealth. This distribution of wealth created a façade of prosperity while masking profound internal imbalances. The Zhou tribes in the far west, during this process of capital accumulation in Shang society, expanded by absorbing neighboring smaller tribes and eventually became the force that replaced the Shang Dynasty. Meanwhile, the vast numbers of disenfranchised wage laborers and proletariat possessed very little wealth. In the absence of ancient social security systems, their ability to withstand risks was extremely fragile. When faced with serious illness, famines, or other sudden disasters, they could easily fall into life-threatening difficulties.

Confronted with survival crises, some chose to leave the capitals and major cities, venturing into remote areas to cultivate land and sustain a basic agricultural life; others had no choice but to flee in search of livelihood elsewhere. This vast disparity between classes led the proletariat to harbor resentment toward the ruling capitalists, with class conflicts becoming increasingly acute. From the perspective of modern society, if such conflicts continued to intensify, they could very likely trigger social upheaval analogous to a proletarian revolution.

2. Economic Contradictions: The Conflict Between Socialized Large-Scale Production and Private Ownership

The economy of the Shang Dynasty to some extent exhibited characteristics similar to socialized large-scale production. With the development of productive forces, society was able to quickly produce a wide variety and large quantities of products, theoretically capable of meeting the basic needs of ordinary people. However, this mode of production also carried inherent risks. If the scale of production expanded excessively and product output far exceeded the actual purchasing power of ordinary people, it could trigger an economic crisis.

For example, during the reign of King Zhou at the end of the Shang Dynasty,

the social wealth of the entire Shang Dynasty had accumulated to a very high level, and various products, such as wine and meat, were produced in large quantities. However, ordinary people had limited purchasing power and still lived in extreme poverty, while King Zhou could purchase these products in large quantities at very low prices for the few in the palace to live in extravagant and decadent luxury. This, of course, would cause dissatisfaction among ordinary people and even some nobles.

In ancient times, such economic crises were not as pronounced as in modern society, but their impact was equally profound. When an economic crisis occurred, many small and medium-sized capitalists went bankrupt because they could not cope with market changes. In stark contrast, large capitalists, leveraging their strong economic power and resource advantages, not only survived but also seized the opportunity to acquire the bankrupt small and medium-sized capitalists, further expanding their own scale and forming monopolies. The change in status of bankrupt small and medium-sized capitalists, turning them into a new proletariat, undoubtedly intensified social contradictions and led to even more severe social class opposition.

3. Ideological Export: Leading to Conflicts among Different Cultural Groups

Once capitalists control aspects such as culture and art, they then engage in ideological export, seeking ways to impose their will on others. If others refuse to accept it, they may resort to coercion, even torture, war, and other means. For example, during the reign of King Zhou of Shang, there was a figure called Jiu Hou, one of the three high ministers of Shang Dynasty. He offered his beautiful daughter to King Zhou, but his daughter did not like King Zhou's decadent lifestyle. This made King Zhou extremely angry, leading him to kill Jiu Hou's daughter and inflict a very cruel torture on Jiu Hou by mincing him into meat paste (Sturgeon, 2019,1).

4. Dynastic Transition: The Historical Inevitability under Intensified Conflicts

Under the catalyzing effect of King Zhou's extravagant and brutal rule,

various social contradictions in the Shang Dynasty reached a critical point. His governing actions severely harmed the interests of different social classes and intensified conflicts among them, especially triggering strong dissatisfaction of the proletariat toward the ruling bourgeoisie. The people's disappointment and resistance toward Shang rule were steadily rising, causing social instability.

At this time, the Zhou tribes, primarily agricultural, keenly recognized this historical opportunity. Aligning with the flow of social development and the demands of the populace, they resolutely initiated an overthrow. The rise of the Zhou Dynasty was not accidental; it was the inevitable result of the long-accumulating and intensifying social contradictions of the Shang Dynasty, a choice shaped by the laws of historical development.

After replacing the Shang Dynasty, the Zhou Dynasty implemented a series of political, economic, and social reforms. Politically, they adjusted the ruling structure and distribution of power and strengthened central control over local governments; economically, they pursued policies favorable to agriculture and the people's livelihoods, promoting recovery and development; socially, for instance, they implemented the well-field system to a certain extent nationalizing land, easing class conflicts and improving social relations. These reforms laid a solid foundation for the further development of early Chinese states.

The rise and fall of the Shang Dynasty profoundly reflect the evolution of class contradictions under the development of private property as well as the historical inevitability of dynastic transitions. It provides valuable historical lessons for later generations, warning people to pay attention to social fairness and adjustments in class relations to prevent social turmoil and dynastic collapse caused by intensifying class conflicts.

4.3. Capitalism in the Han Dynasty

The Shang Dynasty was founded by capitalists and had a unique way of governing the country. During the process of constructing and developing the capitalist economic system, the Shang Dynasty achieved remarkable accomplishments. Capitalists held state power, and the country's development was economically

oriented, deeply penetrating all aspects of society, with particularly fruitful results in the construction of culture and art. The Shang Dynasty's emphasis on sacrificial rituals promoted the development of writing and information technologies such as oracle bone inscriptions (Eno, 2009), and the invention of writing marked humanity's entry into a new stage of social civilization. The Shang Dynasty also made astonishing progress in the field of art, such as the emergence of the earliest musical instruments like chime bells (Du & Liang, 2024). According to *Records of the Grand Historian: Biographies of Merchants and Traders*, descendants of King Zhou of the Shang Dynasty were still skilled in artistic performances such as singing and dancing during the Spring and Autumn and Warring States periods, and used these as a means of making a living (Sturgeon, 2019,2).

However, the rapid development of capitalist economy and the continuous monopoly of capital eventually led to the emergence of a large number of proletarians. Many proletarians were forced to leave cities and engage in agricultural work outside the suburbs, and gradually grew their strength in the process of farming. Eventually, the Zhou Dynasty, represented by the agricultural economy, replaced the Shang Dynasty, and human society entered a new historical period.

After the establishment of the Zhou Dynasty, it initially adhered to a policy of emphasizing agriculture and suppressing commerce, suppressing merchants, which made the descendants of the Shang Dynasty unable to maintain their previous prosperous lives. Since these descendants were not good at farming, under the pressure of survival, the monarch of the Zhou Dynasty finally granted them permission to engage in trade freely within a certain scope. Therefore, the early days of the Zhou Dynasty were basically an agricultural society. However, with economic development, commercial trade, as an indispensable part of the economy, became increasingly important. In order to improve their lives, people actively engaged in commercial activities, and the development of technology promoted the rapid development of the industrial chain. After hundreds of years of development, by the era of the Eastern Zhou Dynasty (Spring and Autumn and Warring States periods), the commodity economy of various states in the Spring

and Autumn and Warring States periods developed rapidly, and the total economic output increased significantly (Fu & Cao, 2019). However, the imbalance of economic development and the increasingly acute class contradictions caused by the capitalist economy made it difficult for the centralized rule of the Eastern Zhou Dynasty to be maintained effectively.

The Han Dynasty achieved national unification, fully opened up trade customs, and had smoother channels for commodity trade exchanges, which promoted rapid economic development and brought capitalist economy into a new stage. Its economic development level was far higher than that of historical periods such as the Liangzhu era and the Shang Dynasty. Compared with previous dynasties, a major feature of the development of capitalism in the Han Dynasty was the records of written media, which enabled us to more accurately understand the specific development of capitalism in the Han Dynasty and the operation mode of the commodity economy.

The development of capitalist economy in the Han Dynasty further promoted the improvement of the civilization level of human society, which was mainly reflected in the development of culture, art, science and technology. The science and technology of the Han Dynasty had developed from simple technologies such as iron and bronze production to the observation of astronomical and geographical phenomena. Among them, the armillary sphere invented by Luoxia Hong in the Eastern Han Dynasty (Lin & Hsiao, 2025) laid a solid foundation for modern humans to understand the operation mechanism of the universe.

4.3.1. Analysis of the Economic Thoughts in Records of the Grand Historian: Biographies of Merchants and Traders

Records of the Grand Historian: Biographies of Merchants and Traders (Sturgeon, 2019,2) is the first article in ancient China that focuses on demonstrating economics. It runs through Sima Qian's economic thoughts and explains them through rich examples, describing the operation of capitalism in the Han Dynasty in a relatively comprehensive and accurate manner. Its economic thoughts mainly cover the following aspects:

1. Completely Free Market Economy

At the beginning of *Biographies of Merchants and Traders*, it is stated that the government and individuals should let things take their course in economic operation and respect economic laws. The less interference there is in economic laws, the smoother the operation of the commodity economy will be. This reflects Sima Qian's recognition of a completely free market economy, which was actually the basic way of economic operation in the Han Dynasty and before.

2. Tradability of Capital

Sima Qian pointed out in the article that people could not only make profits by buying low and selling high in economic activities, but also wealthy capitalists could make profits by lending money and collecting interest. The lending industry was very developed in the Han Dynasty. Of course, since the whole lending process was dominated by the private sector, there were also serious problems such as usury. Therefore, in the Han Dynasty, there were special government agencies to manage private lending, handle private lending disputes, and set the maximum interest rate for loans according to the economic development situation, which was somewhat similar to the function of modern central banks.

3. Capital Orientation

Biographies of Merchants and Traders puts forward the view that "all people in the world come for profit, and all go for profit", believing that the communication between people is based on interests. When there is profit to be made, people are willing to conduct transactions; when there is no profit to be made, no one is willing to communicate. Therefore, the operation of the entire society revolves around the flow of capital, which is essentially no different from modern capitalism.

4. Sufficient Communication

The first paragraph of the article warns people that there should be sufficient communication between people to avoid living without any contact with each

other until death. For society to develop, sufficient communication between people is essential. If communication is insufficient, society will lose its vitality, and the natural economy will also be unable to develop. The foundation of this sufficient communication is commercial trade. During the Spring and Autumn and Warring States periods, various states guarded against each other, leading to insufficient communication and easily triggering problems such as wars. After the Han Dynasty achieved national unification, the barriers to trade were broken, communication between people became smoother, and the country became more stable as a result.

5. Principle of Regional Complementarity

Sima Qian pointed out that the advantage of commercial trade lies in realizing the full complementarity of resources in various regions. For example, regions rich in agricultural products can provide grain to other regions; regions with poor soil but hard working people can weave a large number of cloth and sell it to other regions in exchange for grain; some regions can produce metals, and some regions are good at performing arts, all of which can achieve complementarity through commercial trade.

6. Symbiosis of the Four Professions

The "four professions" refer to industry, agriculture, commerce and sales. These four main profession directions are interdependent and indispensable. Without industry, manufacturing technology will be backward, and agricultural cultivation efficiency will be low; without commerce, agricultural grain cannot be sold, and the surplus grain will rot in the fields; without sales channels for consumers, products cannot reach the hands of consumers. The four professions are interdependent and thrive together.

7. The Gap between the Rich and the Poor Stems from the Difference in Wisdom

Sima Qian believed that the gap between the rich and the poor among people mainly stems from the difference in wisdom. Smart people can grasp business opportunities and earn a lot of wealth; while stupid people cannot grasp opportunities

and can only complain that business is difficult to do. For example, in some seemingly insignificant industries, people with wisdom can see the business opportunities in them and operate in depth, thus becoming rich; while people without wisdom cannot see these opportunities.

8. Moral Constraints on Investment

Although business is for the purpose of pursuing profits, making money still needs to follow moral constraints. Sima Qian believed that the best way to make money is to abide by moral norms; the second is to resort to trickery; the worst is to obtain capital through illegal means. In the process of doing business, one must adopt the best way to make money.

9. Economic Laws Depend on Probability and Statistical Analysis

In the process of economic operation, opportunities are fleeting. If you fail to grasp an opportunity, you may lose it forever. For example, if you buy a large number of goods when the price is high, you may suffer losses when the price falls. Therefore, it is necessary to seize the opportunity to decide when to buy and when to sell. However, the emergence of opportunities is random; sometimes they appear, and sometimes they do not. Therefore, there is a probability distribution in the operation of commodities, and we should maximize the probability to grasp opportunities. The process of making money with certainty is often rare.

4.3.2. Currency System in the Han Dynasty

In the history of currency development before the Han Dynasty, the form of currency showed distinct characteristics of spontaneous development by the private sector. During the Liangzhu era, stone tools were used as currency, and their production was completely independently carried out by the private sector. At this time, the value of stone tools as a medium of exchange for commodities was equal to the value of various commodities actually used. As time went by, jade, which was harder and more durable, came into people's sight, and the technology for processing hard jade became increasingly mature. In the era of Liangzhu Ancient City, jade gradually widely replaced stone tools as currency. It is

worth noting that during this period, there was basically no central management agency to uniformly control the medium of exchange for commodities. The determination of the value of jade currency mainly relied on the delicate divine emblems carved on jade by craftsmen, and the differences between divine emblems were used to distinguish high quality jade from low quality jade. It can be seen that the circulation and management of jade currency completely relied on spontaneous private behaviors, and the private sector maintained the credit of the provided currency through a variety of protection measures.

Even in the later so called "Three Dynasties" (Xia, Shang and Zhou Dynasties) when capitalism developed to a certain extent, there was still a lack of a central management agency to uniformly manage currency, and the value of currency was mainly determined by its rarity for exchange. Under this background, sea shells, which were relatively difficult to obtain, were chosen as currency.

Although bronze coins in the shape of sea shells appeared in the Shang Dynasty, during the Qin Dynasty, the form of currency underwent an important change, and unified round copper coins with square holes Banliang coins were minted nationwide (Pollard & Liu, 2021). The face value and weight of Banliang coins were both half a liang, that is, 12 zhu. At this time, the currency of the Qin Dynasty essentially measured the value of commodities based on the value of bronze itself. However, their minting and use were still mainly carried out by private individuals, and the central government did not implement strong management. This indicates that before the Han Dynasty, a unified currency management agency was always absent.

The currency system of the Han Dynasty ushered in a revolutionary change, with the establishment of a unified central currency management agency as a landmark event (Tao & Wei, 2019). Under the control of this agency, there was a unified standard for the minting of copper coins, and the famous Wuzhu coins came into being. The Wuzhu coins of the Han Dynasty drew on the custom of determining the face value by weight of the Banliang coins of the Qin Dynasty, but reduced their weight from 12 zhu of the Qin Banliang coins to 5 zhu (Wuzhu), and the face value was also adjusted to Wuzhu accordingly, realizing the consistency between the face value and the actual weight.

Compared with the Qin Banliang coins, the Han Wuzhu coins had significant advantages: they were more portable in design and more convenient to use. More importantly, the minting of Wuzhu coins was specially undertaken by the unified central currency management agency, and private minting of coins was strictly prohibited. Those who violated this rule would be sentenced to death. This strict control measure enabled the central government to firmly grasp the right to mint and issue coins, and then accurately mint and recall an appropriate amount of coins according to market conditions, effectively curbing the occurrence of economic problems such as inflation or deflation.

This revolutionary change in the monetary function of the Han Dynasty not only played a crucial role in promoting the economic stability and development at that time, but also laid a solid foundation for the issuance of banknotes in later generations, and had a milestone significance in the history of Chinese currency development.

4.3.3. The Proletariat in the Han Dynasty

The Han Dynasty generally inherited the land management system established since the Zhou Dynasty. Land basically belonged to the state, practicing the concept of "Under the wide heaven, All is the king's land" (Sturgeon, 2019,4), which essentially realized the nationalization of land. However, in the Han Dynasty, the well field system that had existed since the Zhou Dynasty was abolished and replaced by a more flexible land system (Wang, 1996). The state leased land to meritorious princes, dukes, generals and ministers, who then subleased it to landlords, and finally farmers cultivated the land. This land management model made it relatively convenient for the state to collect agricultural taxes. The central government collected about 30% of the agricultural tax from landlords, while after landlords subleased the land to farmers, they collected as much as 50% of the agricultural tax, meaning farmers had to hand over half of the grain produced in the fields to landlords. This model was similar to the capitalist wage labor system. Landlords exploited farmers to obtain surplus value, with the surplus value rate reaching 20% and more, which was a relatively high proportion.

Ordinary farmers basically had no private property of their own; all the land

they cultivated was leased from landlords, and they worked for landlords. In the early Han Dynasty, due to frequent wars, a large amount of land was left uncultivated, and some farmers were able to obtain land and become owner cultivators (Huang & Wang, 2003). Although owner cultivators had to pay taxes to the government, the tax rate was much lower than the amount they would have to pay if they leased land from landlords, so their lives were relatively easier.

In the middle and late Han Dynasty, with the rapid development of the national economy, industry also developed rapidly (Song, 1992). The government run enterprises directly managed by the central government, such as those engaged in salt production, iron smelting, and coin casting, employed a large number of workers, forming a group of working classes who worked in state owned factories (Liu, 2007). Compared with workers in private enterprises, government run enterprises, due to their monopoly position, had good benefits and stable profits, so the workers there had higher incomes.

With the rapid economic development of the Han Dynasty, the industrial chain derived from capitalist society became increasingly rich, leading to a significant increase in the demand for industrial labor and promoting the acceleration of urbanization. The Guanzhong region became the richest area in the country (Liang, 2013), and its wealth accounted for more than 60% of the national total. In addition, after princes, dukes, generals and ministers were enfeoffed in various places, they also developed their own industrial systems locally. For example, the Marquis of Haihun in Nanchang (Ying, Phatlakfa & Soontorntanaphol, 2024) accumulated an astonishing amount of wealth. Throughout the country, cities with concentrated populations emerged continuously, and industry and the tertiary industry in cities developed vigorously. The rapid expansion of private industrial enterprises led capitalists to employ a large number of farmers who had lost their land and could not engage in farming as workers, further expanding the size of the working class. Although the treatment of workers in private enterprises might not be as good as that of workers in government run enterprises, they had more flexible employment opportunities. As long as they worked hard, they had the chance to find better business opportunities and realize the transformation from the proletariat to the bourgeoisie, which was

recorded in detail in relevant historical records.

The rapid development of cities in the Han Dynasty also drove the prosperity of the tertiary industry. Service enterprises such as catering and accommodation emerged rapidly (Li, 2025), and the number of employees increased significantly. This included not only those engaged in the tertiary industry in post stations set up by government offices and institutions (Foster, 2021; Yang, 2015), but also employees of catering service enterprises such as hotels run by private enterprises. For example, in the Hexi Corridor, where merchants traveled frequently, a large number of catering and service industries emerged in post stations. Although the post stations were established by the central government, most of the employees in the hotel service industry were privately hired and had relatively low social status. However, the rise of the tertiary industry created a large number of job opportunities, which strongly promoted the rapid development of capitalism in the Han Dynasty.

4.3.4. The Status and Role of the Bourgeoisie in the Han Dynasty

King Zhou, the last monarch of the Shang Dynasty, was notorious for his appalling performance art, extravagant lifestyle, and cruel tortures. Based on this, after the establishment of the Zhou Dynasty, a restraint mechanism was established to prevent merchants or capitalists from holding political power (Yu, 1984). Since then, the merchant group could no longer obtain the core power to dominate the country's destiny in the national political structure. This ruling concept of emphasizing agriculture and suppressing commerce continued from the Zhou Dynasty to the Spring and Autumn and Warring States periods, and ran through all subsequent dynasties. Although the social status of merchants fluctuated in different dynasties, according to Confucian ruling ideology, the devaluation of merchants' status became a social consensus—no matter how much wealth merchants or capitalists possessed, their social status could hardly compare with that of ordinary officials.

However, as the cornerstone of national development, the importance of commerce has been clearly expounded in Sima Qian's *Biographies of Merchants and Traders* and it is an indispensable element for social development. In the

process of social evolution, although the government introduced and implemented policies to restrict the development of commerce, the momentum of private commercial development could not be contained. By the Spring and Autumn and Warring States periods, the central government had weak control over local vassals, and many vassal states administered independently, leading to the rapid development of commercial economy in some states. Although the Qin Dynasty suppressed commerce to some extent, the Han Dynasty government implemented an enlightened policy and delegated power, creating conditions for the rapid development of capitalist economy in the Han Dynasty.

During this period, although the government advocated "upholding Confucianism alone" (Kong, 2024) and the policy of emphasizing agriculture and suppressing commerce did not undergo fundamental changes, the social status of merchants still showed an upward trend. For example, after the government monopolized the salt and iron trade, it set up special management departments, and many merchants engaged in the salt and iron industry took this opportunity to attach themselves to government agencies and became official merchants, holding considerable power in monopoly industries such as salt and iron. In addition to official merchants, after accumulating sufficient wealth, private merchants in the Han Dynasty also significantly improved their social status, even being comparable to princes, dukes, generals and ministers. For instance, in places like Sichuan, some merchants achieved great success in business, amassing enormous wealth with thousands of servants (Sturgeon, 2019,2). Their travel ostentation was no different from that of princes and ministers, and they were not suppressed by the government. This reflects that in the private sector, merchants formed a set of self-management systems and directly controlled the links of social and economic circulation, while the government was in a higher-level supervisory position. The merchant group that directly interacted with the people had a decisive influence on the economy.

Compared with other dynasties, the Han Dynasty witnessed significant territorial expansion. After Zhang Qian's successful mission to the Western Regions, a large number of Central Asian merchants flocked to the Han Dynasty to conduct trade (Dong, 2022). These Central Asian merchants were not directly

governed by the Chinese government and dominated the trade in the Hexi Corridor with strong power. To effectively administer the Western Regions, the Han Dynasty needed to fully gain the support of these merchants and set up post stations in the Hexi Corridor to meet the needs of border economic development and military defense.

The prosperous commercial trade strongly promoted the rapid development of science, art and culture in the Han Dynasty. In the field of science and technology, the expanding trade network promoted the spread of iron-smelting technology (Zhu, Huang, Guo, et al., 2023), and many merchants introduced advanced iron-smelting technology into the Han Dynasty. Even in remote areas such as Lingnan (Southern China), glass-making technology from the Mediterranean region was introduced (Gan, 2009). At the same time, the development of trade promoted the rapid application of science and technology by the private sector. For example, to meet the demand for convenient text dissemination, writing technology was improved, and Cai Lun invented papermaking in the Han Dynasty (Liu & Chen, 2021). In addition, the demand for astronomical knowledge in navigation technology promoted the development of astronomical observation, with the invention of the armillary sphere by Luoxia Hong being a typical example. These are all important contributions of the Han Dynasty to human civilization, and also reflect that under the unified national market, the circulation links were unobstructed, and the communication and ideological exchanges between people became increasingly frequent.

In the pattern of literary and artistic development, the Han Dynasty showed a more restrained and temperate trend compared with the Shang Dynasty. The root of this difference can be traced back to the mainstream orientation of ideology and culture in different eras.

During the Spring and Autumn and Warring States periods, the Confucian system founded by Confucius had a profound impact on the cultural development of later generations. Confucianism adhered to the concept that "Confucius did not talk about strange phenomena, ghosts and gods", and adopted a prudent and neutral attitude towards sacrificial activities involving the worship of ghosts and gods—neither explicitly denying nor blindly affirming them, but focusing

on the construction of social operation rules and moral and ethical order. This ideological tendency laid the tone for the development of literature and art in the Han Dynasty to a certain extent.

In contrast, sacrifice occupied a core position in the national politics and social life of the Shang Dynasty, and could be regarded as one of the basic functions of the state. The rulers of the Shang Dynasty tried to communicate with ghosts and gods through frequent and grand sacrificial activities to obtain the protection and guidance of the gods and consolidate their ruling position. In this process, oracle bone inscriptions emerged. Initially, oracle bone inscriptions were mainly used to record sacrificial matters, covering aspects such as the objects, time, methods of sacrifice and the results of divination. Over time, the scope of oracle bone inscriptions gradually expanded to all fields of social life, becoming an important carrier of Shang Dynasty culture. At the same time, the solemn and mysterious atmosphere created by sacrificial activities and the pursuit of rituals and decorations greatly promoted the development of Shang Dynasty art and had a decisive impact on the formation of the style and expression techniques of Shang Dynasty art.

After entering the Han Dynasty, restricted by Confucian thought and social and cultural atmosphere, the development of art showed relatively restrained characteristics in both form and content. In the field of music, although the Han Dynasty improved and refined musical instruments invented in the Shang Dynasty, such as chime bells, enhancing the sound quality and performance effect of the instruments, the overall innovation was limited. In fact, after the Han Dynasty, many Chinese musical instruments, while inheriting the local tradition, were mainly influenced by the musical art of Central Asia and even Europe (Chang, 1993).

The focus of the development of culture and art in the Han Dynasty was more inclined to the field of literature. *Records of the Grand Historian* written by Sima Qian, with its grand historical perspective, rigorous narrative structure, vivid character portrayal and profound ideological connotation, became an immortal masterpiece in the history of Chinese literature and set a model for later historical and literary creation. In addition, the opening of the Hexi Corridor

opened a channel for economic and cultural exchanges between the Han Dynasty and the Western Regions and even wider areas. The vigorous development of trade not only promoted the circulation of materials, but also promoted the spread and integration of culture. Against this background, a large number of mural art emerged (Whitfield, Whitfield & Agnew, 2015). With their rich themes, diverse forms of expression and exquisite painting skills, these murals showed the style of Han Dynasty society and the spiritual world of the people, exerted a profound and lasting impact on the development of later painting art, and became one of the important origins in the development process of Chinese painting art.

4.3.5. The Relations of Production in the Han Dynasty

The Han Dynasty inherited the governance and management system of the Zhou Dynasty and still took private ownership as the economic foundation. After Dong Zhongshu proposed "upholding Confucianism alone", the national governing strategy was basically finalized and lasted for thousands of years. Similar to the Zhou Dynasty, the throne of the Han Dynasty was inherited by the royal family, which profoundly reflected the nature of private ownership of property—the emperor controlled the entire country and passed it on to future generations as private property. Among the people, although the situation was different from the merchant rule in the Shang Dynasty, it was in line with the Zhou Dynasty, with the policy of emphasizing agriculture and suppressing commerce being implemented.

Compared with the modern national ruling system, the rule of the Han Dynasty was mainly led by professional politicians. This model had certain advantages in regulating the distribution of social wealth. Given that merchants had unique advantages in wealth accumulation, the policy of emphasizing agriculture and suppressing commerce became an important means to regulate merchants' wealth and promote the relative equality of social wealth, alleviating the problem of uneven distribution of social wealth to a certain extent.

The land system of the Han Dynasty showed certain particularities. Although land had the attribute of state ownership to a certain extent, the land granted to

landlords through enfeoffment was protected by the state, which essentially endowed landlords with the attribute of private wealth. The state's protection of private wealth enabled landlords to have the right to sublease land to farmers. Although the effective management of state power institutions prevented social instability caused by farmers' dissatisfaction to a certain extent, in special cases—such as when farmers had no harvest due to natural disasters—landlords still forced farmers to pay land rent, which often led to social unrest (Levy, 1956), and the root cause lay in the gap between the rich and the poor.

In addition to the management and subleasing of private property by landlords, commercial activities also provided an opportunity for the poor proletariat to change their destiny. In places like Sichuan, some merchants accumulated huge wealth, with thousands of servants and even more assets than some princes and ministers. Although the state protected merchants' property, it imposed many restrictions on symbols of personal status. For example, in daily communication, merchants had to show a more humble attitude than officials; the Han Dynasty also stipulated that merchants were not allowed to wear expensive clothes such as silk (Sima, 2011). However, these restrictions were mostly superficial, and merchants could essentially fully enjoy various rights and interests brought by wealth.

When the capital accumulation of capitalists in the Han Dynasty reached a high level, they could get rid of the shackles of direct participation in operation and management and obtain more wealth through capital operation. Among them, lending money became a common method. In the early stage, the interest rate of lending was basically unregulated, and the requirements for collateral were extremely diverse, covering various assets such as property, fields, houses, and even personal freedom. If the borrower was unable to repay the debt, he could pledge his own or his children's personal freedom to the capitalist and become his servant (Li, 2018).

This situation caused many social problems. To solve these problems, the Han Dynasty specially set an upper limit on the interest rate of private lending. In private lending, if the interest rate exceeded the specified limit, it was illegal, and the borrower could report to the government, which would intervene to

punish the usurious capitalists. The upper limit of the interest rate was not fixed, but fluctuated with the social and economic situation, generally around 20%, but it might increase when inflation was severe and decrease otherwise. The official's strict management of the circulation process of capital lending enabled private lending disputes to be resolved through reporting to the government. For example, when encountering "deadbeats" who refused to repay debts, the government could assist in debt collection. This had certain similarities with the modern social financial system.

However, the completely free market economy, especially the efficient capital lending operation mode, led to many problems in the distribution of social wealth. In loan contracts secured by personal freedom, borrowers who were unable to repay their debts often faced the dilemma of selling their children or even being restricted in their personal freedom, which further expanded the scale of the proletariat. In addition, in the process of ordinary operation, the completely free capitalist production mode adopted by the Han Dynasty could not solve the fundamental contradiction between the socialized large-scale production and the private ownership system. To pursue profits, capitalists produced a large number of commodities. In the early stage, the strong demand helped capitalists accumulate capital, but as the number of commodities continued to increase, prices fell, and production costs could not be covered by the selling price, leading to the bankruptcy of a large number of enterprises. As Sima Qian stated in *Biographies of Merchants and Traders*, doing business required selling when prices were high and buying when prices were low, but not all capitalists could do this, which led to the bankruptcy of a large number of small and medium-sized enterprises, and the original capitalists became proletarians again. It can be seen that under the operation of capitalism in the Han Dynasty, the distribution of wealth showed a trend of concentration from the majority to the minority, and this process created more proletarians, laying the groundwork for the demise of capitalism in the Han Dynasty.

4.3.6. The Demise of Capitalism in the Han Dynasty

From the perspective of superficial phenomena, the fall of the Eastern Han Dynasty can be attributed to many factors such as the armed separatism of feudal

lords and the intervention of imperial relatives in politics. At the end of the Eastern Han Dynasty, after the outbreak of the Yellow Turban Uprising, the country gradually took on a situation of tripartite confrontation (Luo, 2018). This situation profoundly reflects that the Eastern Han government at that time was no longer able to control the armed separatist forces of local feudal lords. Cao Cao took control of the central power of the Eastern Han Dynasty in the area around the capital, forming a political pattern of "holding the emperor to order the feudal lords" (De Crespigny, 2010); at the same time, two armed separatist regimes, Eastern Wu and Shu, emerged in the southeast and southwest respectively. In fact, the Eastern Han regime had existed in name only by then, and the country fell into a divided state similar to that of the vassal states in the Eastern Zhou Dynasty. Each vassal state formed an armed separatist situation, with only fewer regimes compared to the vassal states in the Eastern Zhou Dynasty.

The phenomenon of imperial relatives intervening in politics caused serious consequences in the Western Han Dynasty, eventually leading to its downfall. Wang Mang seized power by virtue of his status as an imperial relative and established the Xin Dynasty (Loewe, 1994). However, the Wang Mang regime did not bring prosperity and strength to the country; instead, because it attempted to restore the management system and methods of the Zhou Dynasty, ignoring the fact that the productive forces had achieved considerable development during the Western Han Dynasty, the old relations of production were seriously out of line with the development needs of the new productive forces. This resulted in a severe economic blow and a sharp decline, and the Xin Dynasty collapsed after only more than ten years of existence.

However, if we explore the in-depth reasons, we can find that the decline of "capitalism" in the Han Dynasty was closely related to the fundamental contradictions of capitalism. In Han Dynasty society, the rapid development of "capitalism" led to the continuous concentration of wealth in the hands of a small number of wealthy capitalists. After accumulating huge wealth, these capitalists, when simple economic means could not satisfy their greed and in pursuit of greater profits, naturally extended their influence to the political field and

challenged the authority of the central government. This behavior caused local feudal lords to openly defy the arrangements of centralization in order to seek their own interests. For example, judging from the excavated tomb of the Marquis of Haihun in the Han Dynasty, his wealth was comparable to that of the emperor. It can be seen that the central government's control over these feudal lords was very weak at that time (Yang, 2019).

On the other hand, when the development of "capitalism" tended towards monopoly, a large number of small and medium-sized bourgeois capitalists lost their wealth, were annexed by large capitalists, and became proletarians again. At the same time, many owner-cultivators continuously lost their land due to capital operations (such as usury exploitation), urban expansion, and industrialized production, and became tenant farmers dependent on landlords, thus constantly expanding the ranks of the proletariat. The growth of the proletariat brought about a series of social problems: ordinary people's families lacked wealth accumulation and were unable to resist external risks. Once natural disasters and other unexpected events caused a reduction in grain production, farmers could not pay the land rent to landlords; handicraftsmen also found it difficult to sell their products due to the decline in social consumption capacity. This series of chain reactions led to extreme hardship among the people, with a large number of people losing their homes and becoming displaced, which in turn triggered peasant uprisings. The Chimei Uprising at the end of the Western Han Dynasty (Zhang, 1996) and the Yellow Turban Uprising at the end of the Eastern Han Dynasty (Michaud, 1958), etc., all occurred because ordinary people had extremely weak resistance to natural disasters and were forced to rise up when they had no hope of survival.

In addition, the Han Dynasty government implemented the policy of "upholding Confucianism alone". Although those in power theoretically represented the interests of the state, due to the concentration of a large amount of wealth in the hands of a small number of wealthy capitalists, this policy was exploited and strengthened by capitalists, becoming a tool for them to suppress other popular cultural and artistic forms among ordinary people. This approach greatly intensified social contradictions, especially those between different ethnic

groups. For example, the Yellow Turban Uprising was launched under the banner of Taoism (Michaud, 1958). This phenomenon deserves great attention, as it reflects the complexity and depth of social contradictions, as well as the role of different ideological and cultural factors in social unrest.

4.4. Capitalism in the Song Dynasty

Compared with many other dynasties, the Song Dynasty showed remarkable uniqueness. After Emperor Taizu of the Song founded the dynasty, an event of profound significance for the course of history occurred—the "Release of Military Power at a Feast" (Chen, 2024). At the beginning of the Song Dynasty, Emperor Taizu gathered the military generals, and after a few rounds of wine, he reasoned with them and successfully relieved them of their military power. Since then, throughout the social development of the Song Dynasty, a pattern emerged where civil officials governed the country in an all-around way.

The advantages of governance by civil officials were quite prominent. With their profound cultural literacy and knowledge reserves, the group of civil officials could think more deeply about various social issues and accurately balance the dynamic factors arising in the process of social development. This governance model laid a solid foundation for the development of capitalism in the Song Dynasty. However, the governance by civil officials also had obvious drawbacks; its neglect of the development of military technology sowed the seeds for the eventual downfall of the Song Dynasty.

Compared with the Shang and Han dynasties, capitalism in the Song Dynasty exhibited a unique style, with its core feature being that the level of social productive forces reached a new height and new technologies emerged one after another. The Song Dynasty achieved remarkable results in the field of science and technology, with the invention of gunpowder and the compass being milestones. The application of gunpowder allowed humans to accomplish tasks that were previously difficult to achieve solely with manual labor by leveraging its power; the birth of the compass greatly expanded the boundaries of human navigation. With the help of the compass, the maritime trade of the Song Dynasty

extended to more distant regions such as Central Asia and Europe, forming the Maritime Silk Road (Guan, 2016). Compared with the overland Silk Road of the Han Dynasty, the Maritime Silk Road had significant advantages in terms of cargo capacity and transportation efficiency. Maritime navigation could make full use of wind power to drive ships, use the buoyancy of water to carry heavy loads, and the application of mechanical power devices greatly reduced the input of manual labor. In contrast, overland transportation mainly relied on animal power such as camels and horses. It can be seen that capitalism in the Song Dynasty had already embarked on a new era of gradual globalization and large-scale commodity trading, establishing a social and economic system with characteristics of the times.

Over two thousand years after the fall of the Shang Dynasty, the sense of fear left by its cruel culture and art gradually faded from the minds of the people. In addition, since the Han Dynasty, frequent cultural and artistic exchanges with the Western Regions brought the diverse cultural and artistic forms of the Western Regions to the southeastern coastal areas of China, injecting new vitality into the development of culture and art in the Song Dynasty and making it more innovative and groundbreaking.

The royal family of the Song Dynasty, especially the Zhao imperial clan, had many successors who had a strong interest in art. The calligraphy skills of Emperor Huizong of the Song, Zhao Ji, were extremely high and admirable, exerting a profound influence on the art of later generations (Bickford, 2006). Embroidery art also achieved innovative development in the Song Dynasty, with a significant improvement in its artistic quality. A special "The Embroidery Department of the Wenxiu Academy" was even established (Xu, Cheng, Lian, et al., 2023), laying the foundation for the modern vocational education and training system.

In the field of cultural thought, many thinkers were able to freely reflect on issues related to social and cultural construction and conduct in-depth reflections on Confucianism. After re-examination and improvement, Neo-Confucianism emerged (Liu, 2008), providing new concepts for national governance

and enabling national governance to better adapt to the needs of social development.

In terms of literature, among the Eight Great Prose Masters of the Tang and Song dynasties (Mao, 2010), six well-known litterateurs were from the Song Dynasty, while only two were from the Tang Dynasty. This fully demonstrates that the achievements of literature and art in the Song Dynasty far surpassed those of the Tang Dynasty.

In the field of engineering technology, the Song Dynasty made remarkable achievements (Jiang, 2023). At that time, many ingenious and precise mechanical devices could be invented, and the emergence of machine tools made the processing of tools and mechanical equipment more precise. In terms of mineral smelting, a large number of new technologies were widely applied, and the steel output surpassed that of the Tang Dynasty in all aspects, even equivalent to the total steel output of Europe in 1700 (Song & Liu, 2012). This reflects the strong development momentum of industrial technology in the Song Dynasty and the scale of the proletariat, and the progress of industrial technology is an important symbol of the development of capitalism.

The Song Dynasty also achieved fruitful results in the basic research of scientific theories. Based on the armillary sphere invented by Luoxia Hong in the Han Dynasty, scientists in the Song Dynasty had a clearer and more accurate grasp of the laws of the movement of stars in the universe. Astronomers could accurately identify more than 1,000 stars (Jiang, Liang, Liang, et al., 2017), effectively distinguish between planets in the solar system and stars in other star system, accurately identify the five planets in the solar system (Venus, Jupiter, Mercury, Mars, and Saturn), and observe the explosion of Supernova SN 1054 (Powell, 2019). Through long-term observation, Shen Kuo summarized that the orbits of these five planets are elliptical (Yang, 1975). This discovery was a major advancement in the field of basic science for humanity, providing solid observational data support for the proposal of Kepler's Three Laws in the 16th century and Newton's Law of Gravitation.

To sum up, the Song Dynasty was highly close to the modern level in many

aspects such as science and technology, culture, and art, and its development achievements laid a solid foundation for modern science and technology, culture, and art. As a unique dynasty in Chinese history, the Song Dynasty left a profound mark in the process of capitalist development and exerted a far-reaching and lasting influence on later generations.

4.4.1. Currency in the Song Dynasty

Since the Han Dynasty implemented centralized management of currency issuance, the Sui, Tang, Song dynasties and subsequent dynasties all continued this centralized management model. This measure not only enhanced the stability and credibility of currency but also endowed the central government with the ability to flexibly adjust the currency value. Compared with the Han Dynasty, the currency system of the Song Dynasty showed significant diversity, including copper coins and iron coins (Wayman & Wang, 2003; Xu, Hu & Xie, 2004), and a new type of copper coin was issued corresponding to each reign title (Zhang, 2006).

In the Song Dynasty, art, especially calligraphy, achieved unprecedented development and received great attention, and this cultural atmosphere also profoundly influenced currency design. The engraved fonts on currency became increasingly artistic, presenting a variety of styles, including even the "Slender Gold" script originally created by Emperor Huizong of the Song Dynasty. In addition, the use of gold and silver became increasingly widespread in the Song Dynasty (Katō, 2006). Due to its high value, gold was mainly used in large-scale transactions and official rewards; silver, on the other hand, was more commonly used and widely applied in daily transactions. Although there are occasional descriptions in Ming Dynasty literary works of scenarios such as paying for meals and accommodation with silver taels (Sin, 2017), which may reflect the social landscape of the Ming Dynasty, they also provide valuable collateral evidence for the study of currency use in the Song Dynasty. The widespread circulation of gold and silver was closely related to the prosperity of foreign trade in the Song Dynasty; the common use of gold and silver in Central Asia and Europe promoted the circulation and formation of habits of using gold and silver in

Song Dynasty trade.

Another revolutionary change in the Song Dynasty's currency system was the issuance of paper money, such as Jiaozi and Huizi (Guo, 2014; Foster, 2018). The introduction of paper money not only revolutionized the currency system but also exerted a profound impact on the modern currency system, and its transaction experience provided valuable references for the operation of modern currency. Paper money in the Song Dynasty was uniformly issued by the central government, which was more universal and authoritative compared with private contracts. To ensure the durability of paper money, the Song Dynasty used high-grade paper materials (Xie, 1994). At the same time, considering the problem that wooden engraved master plates were prone to wear due to the huge circulation of paper money, the technology of copper plate master plates developed rapidly in the Song Dynasty, especially in the Southern Song Dynasty (Wu, 1993), to ensure the large-scale issuance and stable quality of paper money.

Anti-counterfeiting of paper money was also an important part of the Song Dynasty's currency system. To prevent lawbreakers from counterfeiting paper money, the government adopted complex patterns and dense lines on paper money such as Jiaozi to increase the difficulty of counterfeiting, including even the watermark technology widely used in modern paper money (Li, 2010). From the widespread use of paper money in the Southern Song Dynasty, this anti-counterfeiting measure achieved remarkable results. Archaeological findings show that more copper coins of the Northern Song Dynasty have been excavated, while far fewer copper coins of the Southern Song Dynasty have been unearthed. This is related to the "coin shortage" in the Southern Song Dynasty (Ge & Chang, 2008) and also proves that daily transactions in the Southern Song Dynasty mainly used paper money, further confirming the popularization and success of paper money in the Southern Song Dynasty.

The widespread use of paper money alleviated the problem of copper coin shortage in the Song Dynasty to a certain extent. The Song Dynasty had developed economic and trade activities; especially, the maritime trade of the Southern Song Dynasty extended to Central Asia, Europe, Japan, Southeast Asia and

other regions, leading to a large outflow of copper coins. At the same time, relatively backward economies such as the Liao and Jin dynasties in the north often used copper coins and iron coins from the Song Dynasty to make weapons. To restrict the circulation of weapons in these regions, the Song Dynasty had to limit the issuance of copper coins and iron coins, and the introduction of paper money became an effective way to solve this problem.

The widespread use of paper money marked a revolutionary change in the Song Dynasty's financial system. By controlling the issuance of paper money, the central government effectively regulated the market money supply and inflation, laying the foundation for the modern financial system.

4.4.2. Governance Characteristics of the Bourgeoisie in the Song Dynasty

The prosperity of commerce and trade in the Song Dynasty drove the rise of a capitalist market economy. The advanced development of overseas trade enabled capitalists to conduct business across national borders, which weakened the central government's control over commodity trade. This transformation promoted the free development of capitalism in the Song Dynasty, but it also brought about social issues, such as disagreements in foreign policies. The maritime embargo implemented after the Ming Dynasty (Li, 2010) aimed to strengthen the central government's control over overseas trade, yet it failed to achieve the expected results and instead weakened the country's economy. In contrast, the Song Dynasty's free and open trade policies allowed it to accumulate substantial wealth, ensuring sufficient funding for national defense.

At the beginning of the Song Dynasty, Emperor Taizu's policy of reclaiming military power was continued, and governance by scholars became the mainstream. The advantage of a scholar-governed government lay in its ability to fully consider the well-being of the people and the healthy development of the trade ecosystem. However, the weakened government control also meant a stronger role for market regulation, with market participants such as capitalists, workers, and farmers becoming the main forces in market adjustment. As capitalism

developed further, monopolistic capitalists gradually emerged, effectively controlling the market and holding decisive say. For instance, when issuing paper money in the Song Dynasty, the government would select a dozen wealthy merchants to jointly provide guarantees (Gao, 2024). This ensured the credibility and stability of the paper money's value, demonstrating the capitalists' influence on the implementation of government policies.

The global nature of trade in the Song Dynasty brought a large amount of wealth into the country. By that time, the core urban area of the Song Dynasty's capital, Bianjing, had already reached 50 square kilometers, with a population of around 1 million. This far exceeded the Liangzhu ancient city and the Yin Ruins. It was home to numerous wealthy individuals, resembling modern Wall Street. Nevertheless, the disdain for merchants, which had existed since the Zhou Dynasty, made merchants gradually realize the importance of political power. Merchants in the Song Dynasty actively participated in national political management (Wang, 2010). When the country needed to build up national defense, they donated significant amounts of money. This not only strengthened the national defense system but also elevated their own social status.

Additionally, the royal clan of the Song Dynasty had a large number of descendants as it expanded. Unlike previous dynasties, the total property of the Song royal family was limited. As a result, the wealth distributed to each subsequent generation gradually decreased, and after more than a dozen generations, the descendants were no different from ordinary commoners. Against this backdrop, wealthy merchants gained official status by marrying descendants of the royal family, achieving a mutually beneficial arrangement (Zhu, 1941). The Zhao royal family was also willing to accept this arrangement. Meanwhile, high-ranking officials and scholar-officials were also willing to marry into wealthy merchant families. For example, Zhu Song, the father of Zhu Xi, a renowned Neo-Confucian scholar in the Song Dynasty, married a woman from a wealthy merchant family (Zheng, 2023). This was unimaginable in previous dynasties, reflecting the unprecedented rise in the status of capitalists in the Song Dynasty.

4.4.3. The Proletariat in the Song Dynasty

Compared with other historical periods, the common people in the Song Dynasty (including farmers and other groups) enjoyed an unprecedented level of personal freedom. Specifically, driven by their aspirations for personal development, ordinary people—even farmers—had the ability to break away from existing employment relationships at any time to pursue independent development (Diao, 2013). For instance, when they had access to the necessary resources, they could engage in independent farming or participate in commercial activities. This degree of freedom was rare among all dynasties in Chinese history, and it even surpassed that of the subsequent Yuan, Ming, and Qing dynasties. Such a social environment led to the diversification of individual job opportunities. Due to their economic status and the extent of their ownership of the means of production, the common people in the Song Dynasty were highly close to the modern concept of the proletariat and exhibited typical proletarian attributes within the framework of the relatively developed capitalist economy of the Song Dynasty.

In terms of the number of workers employed in factories during the Song Dynasty, the scale was extremely large (Guo, 2012). An analysis of existing historical documents shows that alone, the state-owned textile factories in the capital employed over 2,000 workers. Meanwhile, the four weapons manufacturing factories in the capital hired approximately 10,000 workers, meaning each weapons factory employed more than 2,000 workers. Additionally, there were other industries such as coin casting, winemaking, and construction, each of which employed around 10,000 workers. This figure does not even include home-based female textile workers or those in upstream sectors of industrial chains (such as weapons production and coin casting), including mulberry cultivation, mining, and smelting.

Although farmers still accounted for a large proportion of the total population in the Song Dynasty, agricultural production at that time had already shown a significant trend of diversification. In addition to the increased yields of food crops such as rice and wheat achieved through advanced technologies,

a large amount of farmland was converted to the cultivation of cash crops, with mulberry cultivation being a typical example (Wang, 2020). The mulberry cultivation technology in the Song Dynasty was highly mature, and the scale of cultivation was enormous—directly reflecting the prosperity of the silk-weaving industry. However, neighboring countries failed to recognize the economic value of mulberry trees; when the Jurchen-led Jin army invaded, they even cut down mulberry trees and used them as firewood, treating them as useless shrubs (Zheng, Wu & Chen, 2022). This phenomenon indirectly confirms that farmers in the Song Dynasty had been deeply integrated into the industrial production chain, and some of them had transitioned to the status of industrial workers.

From the scenes of daily life in Bianjing (modern Kaifeng), the capital of the Northern Song Dynasty, depicted in *Along the River During the Qingming Festival* (Chang, 2016; Palace Museum, 2024), it can be seen that the common people in the capital had access to a wide variety of occupations, and their living conditions shared many similarities with those of modern society. In the field of transportation, a three-dimensional transportation system combining water and land routes had already taken shape: water transportation was mainly used for the transport of bulk goods, and its technical form had made significant progress compared with that of the Liangzhu Ancient City period; land transportation relied on wheeled vehicles such as horse-drawn carriages and ox carts to improve efficiency. In terms of the urban occupational structure, the employment options available to the proletariat in Bianjing included catering services, accommodation, textile printing and dyeing, and shipping, among other fields. The cultural industry also flourished—scenes in the painting show citizens gathering to listen to storytellers, seeking fortune-telling, attending wedding processions, and consulting medical practitioners. It even records details such as government tax officials collecting taxes from peddlers at city gates. Notably, government runners appeared idle; in some parts of the painting, runners are even shown napping in front of government offices, which indirectly reflects the good public security situation in Kaifeng at that time.

Building on the legal system of the Han Dynasty, the Song Dynasty further advanced its legal construction (Zhang, 2021; You & Ni, 1998). Widely circulated

stories such as Bao Zheng adjudicating cases (Wang, Yin & Liu, 1995) are vivid examples of the Song government establishing specialized mediation institutions to protect the rights and interests of ordinary people. This institutional design enabled the capitalist economy of the Song Dynasty to operate effectively while taking into account the interests of the proletariat.

The prosperity of foreign trade in the Song Dynasty provided new development paths for the dynasty's own proletariat. When domestic development opportunities were limited, a large number of proletarians achieved class mobility through foreign trade, and some eventually joined the ranks of the petty bourgeoisie or even the wealthy (Wang & Liu, 2007). This phenomenon of wealth accumulation directly led to a significant increase in the proportion of wealthy citizens in cities such as Kaifeng and Quanzhou.

In international trade, the Song Dynasty maintained a huge trade surplus with neighboring countries for a long time (Liu & Lü, 2012): natural resources from northern countries such as the Liao and Jin dynasties flowed into the Song Dynasty at low prices, while the Song Dynasty exported highly processed industrial products (such as tea) and cultural products (such as poems, literary works, and other carriers of ideology). This trade pattern led to the gradual depletion of natural resources and the emptiness of state treasuries in northern countries, which in turn caused a rapid rise in their overall debt levels. Taking the Liao Dynasty as an example, while it "endured" the huge trade deficit with the Song Dynasty, it once attempted to cut off trade ties. However, due to its lack of key commodities such as tea, it was unable to conduct gold and silver transactions with the Western Regions, ultimately leading to the deterioration of its national finances and forcing it to resume trade with the Song Dynasty. Even the annual tribute paid by the Song Dynasty to the Liao Dynasty was just a drop in the bucket and could hardly make up for the resource depletion caused by the trade deficit. On the other hand, when the Liao Dynasty was unable to offset its trade deficit with the Song Dynasty, it brutally oppressed neighboring countries that were even more underdeveloped than itself, such as the Jin Dynasty and Goryeo. This ultimately aroused the resentment of these countries and led to the destruction of the Liao Dynasty (Piao, 2022). Therefore, the Song Dynasty

did not maintain its rule by reducing the number of proletarians within its borders; instead, it created new proletarian groups in neighboring regions through means such as exporting inflation. This laid a structural hidden danger for the eventual demise of capitalism in the Song Dynasty.

4.4.4. Relations of Production in the Song Dynasty

From the perspective of ownership of the means of production, the Song Dynasty, consistent with other dynasties, operated under a private ownership system. A typical manifestation of this was the hereditary monarchy system: once a ruler ascended to power, they gained control over enormous wealth, which could be passed down to their descendants. This was one of the core characteristics of private ownership. However, compared with other dynasties, the private ownership system in the Song Dynasty exhibited more thorough and distinct features.

In the Song Dynasty, the protection of private property was supported by clear legal systems (Chen, 2017; Li, 2014). At the official level, effective measures for safeguarding private property—including even copyright protection—were established (Feng, 2005). To earnestly protect the rights and interests of private property, the Song Dynasty developed a comprehensive legal framework and enforcement institutions. This allowed ordinary people to appeal to official authorities for fair rulings when their private property was infringed upon.

Transformation of the Land Ownership System

Since the Zhou Dynasty, land had been primarily owned by the state. It was distributed to vassals, princes, and landlords through enfeoffment, who then leased it to farmers for cultivation. This model was closely tied to the fact that feudal dynasties relied on land taxes as their main source of revenue. By the Song Dynasty, the vigorous development of industry had expanded people's sources of income—farming grain on land was no longer the sole economic means, and the state's tax revenue also became diversified. The Song Dynasty specifically established tax-collecting institutions for foreign trade transactions (Fu, 2013), which demonstrated the diversity of the state's tax sources.

Against this backdrop, the value of land owned by the landlord class relatively

diminished, and land became a tradable commodity (Yang & Cui, 2011; Long & Chi). Meanwhile, the right to use land and the ownership of land were gradually separated. This transformation granted farmers greater freedom: they could independently choose whether to lease land from landlords, further enhancing their personal freedom (Chen, Jiao & Li, 2025). This freedom promoted the diversification of land use—apart from growing grain, land could also be used to cultivate various cash crops such as mulberry trees. This deepened the integration of the Song Dynasty's land system with the development of capitalist industry and improved the entire industrial chain.

Acquisition of Property by Urban Residents and Social Mobility

For urban residents, personal property could be accumulated through their own labor. However, in the process of industrial production, the wealth that ordinary people earned by working for capitalists was extremely limited, barely sufficient to meet their basic living needs. Therefore, to achieve significant wealth growth, one needed to move up to the capitalist class.

If the Song Dynasty had relied solely on domestic trade, the concentration of wealth in the hands of a small number of large capitalists would have been inevitable—similar to the situation in other capitalist systems. However, the Song Dynasty's foreign trade was highly developed. In the north, it engaged in trade with the Liao and Jin dynasties, allowing many ordinary people to accumulate substantial wealth; in the south, through the Maritime Silk Road, Chinese products such as tea, porcelain, and silk were transported overseas for trade, enabling numerous common people to accumulate wealth and improve their social status. The government ensured the legitimacy of this income through taxation. This model not only promoted trade development and increased government revenue but also protected and boosted the growth of personal wealth, sharing similarities with modern capitalist economic systems.

Class Relations and Income Distribution

From the perspective of class relations, the well-developed industrial chain in the Song Dynasty allowed the bourgeoisie to occupy the upper management position. By managing the operation of the industrial chain, capitalists organized

the harvesting of raw materials, processing and production, and product sales. They then distributed products to the market through domestic trade and foreign trade channels. In this process, capitalists needed to hire a large number of laborers, and these wage workers essentially served the capitalists.

Wage workers created enormous value. Taking silk production as an example, each link—from mulberry cultivation, mulberry leaf harvesting, sericulture, silk reeling, processing into fibers, to weaving into silk and selling—contained significant value. However, most of this value was ultimately obtained by capitalists. Capitalists only paid wage workers enough to meet their basic living needs (Guo, 2012), while seizing the vast majority of surplus value. This type of class relation and income distribution method was highly similar to that of modern capitalist systems, which easily triggered conflicts between different classes and led to the problem of the wealth gap.

Resource Acquisition and Surplus Value Distribution

Although the Song Dynasty had a complete industrial chain, it needed to obtain many raw resources required for production from other countries and regions through trade. The Song Dynasty mainly imported raw materials such as gold, silver, and gemstones, as well as animals such as horses, from neighboring countries. Wage workers (who could be regarded as the proletariat) in neighboring countries engaged in more arduous work. Although the fruits of their labor had great value in the Song Dynasty's market, these workers received even lower remuneration, and a large amount of surplus value was still seized by capitalists in various regions.

4.4.5. The Demise of Capitalism in the Song Dynasty

Capitalism in the Song Dynasty exhibited a highly advanced and developed state. Despite facing complex internal and external challenges, it persisted for over 300 years—a fairly long duration compared to the succession of dynasties in Chinese history. However, like other forms of capitalism, capitalism in the Song Dynasty was trapped by the fundamental contradictions of capitalism, which ultimately and inevitably led to its decline and fall.

Looking back at history, the capitalist civilization of the Liangzhu Ancient City was devastated by catastrophic floods caused by natural disasters; capitalism in the Shang and Han dynasties collapsed due to conflicts triggered by the intensification of internal contradictions. The decline of capitalism in the Song Dynasty, however, was closely linked to the dynasty's vigorous development of foreign trade.

During the Northern Song Dynasty, through the *Chanyuan Covenant* (Schwarz-Schilling, 2010), the Song and Liao dynasties maintained a peaceful and friendly relationship for over a century. Nevertheless, during this period, the trade between the Song and Liao dynasties was severely imbalanced. The Song Dynasty exported a large quantity of finely processed industrial products and cultural and artistic products to the Liao Dynasty (Wang, 2024). Due to the limitations of its own industrial structure, the Liao Dynasty lacked sufficient goods to sell to the Song Dynasty and could only rely on gold, silver, and other precious metals obtained from the Western Regions and Central Asia to conduct exchanges with the Song Dynasty (Liu & Lü, 2012). This trade pattern resulted in a huge trade deficit of the Liao Dynasty with the Song Dynasty, leading to an empty state treasury and high levels of debt. Although the Liao Dynasty, leveraging its advantageous geographical location between the Song Dynasty and regions such as Central Asia, engaged in transit trade—transporting tea from the Song Dynasty to Central Asia, Europe, and other places in exchange for precious metals—it adopted relatively violent means against neighboring regions, especially the Jurchen tribes in the north, in an attempt to quickly make up for its trade deficit with the Song Dynasty. This aroused resistance from neighboring ethnic minority states. Eventually, the Jin Dynasty rose up in rebellion at the end of the Liao Dynasty and overthrew the Liao's rule (Li, 2024).

The relationship between the Jin Dynasty and the Southern Song Dynasty was quite similar to the early relationship between the Liao and Song dynasties. After the Jin and Song dynasties signed a peace treaty (Li & Zhao, 2010), the two countries also coexisted peacefully for approximately a century. However, although the Jin Dynasty had a vast territory and rich land, it was not proficient

in commercial operations and had relatively scarce commercial resources. It also maintained a long-term trade deficit with the Southern Song Dynasty. To make up for this deficit, the Jin Dynasty brutally oppressed the Mongols in the north. Eventually, the Mongol Empire rose, destroyed the Jin Dynasty (Bao, 1993), and conquered the Southern Song Dynasty decades later.

From the perspective of the Southern Song Dynasty's demise, on the surface, it was because the Southern Song's military strength was weak, and it was forced to retreat repeatedly under the military pressure of the Liao, Jin, and Mongol empires, ultimately leading to its downfall. However, from an essential perspective, an analysis using the theory of the fundamental contradictions of capitalism is more profound. From the perspective of capitalism's fundamental contradictions, the contradiction between the socialized nature of production and the private ownership of the means of production drove the Song Dynasty to produce massive quantities of goods. Since the domestic market could not fully absorb these goods, the Song Dynasty resorted to foreign trade to export them—essentially a way to transfer economic crises. This transfer resulted in huge trade deficits of neighboring countries with the Song Dynasty, as a large amount of natural resources and precious metals flowed into the Song Dynasty. This left these neighboring countries with empty treasuries, high debts, and pushed them into an overall state of poverty. This gave rise to a large number of proletarians in the northern countries; when these proletarians could barely sustain their livelihoods, they naturally rose up in resistance. The capitalism of the Southern Song Dynasty sowed the seeds of its own destruction by ignoring the issue of global trade balance. In essence, during the process of capitalist globalization, the relationship between wealthy countries and poor countries was similar to the interest opposition between the bourgeoisie and the proletariat.

4.5. Capitalism in Europe and North America

The germination of capitalism in Europe can be traced back to the 14th century, originating in Italy (Li, 2012). At that time, some workshop owners in Italy began to hire workers for production and pay them wages. In this process, workers

broke away from farm work, freed themselves from the bondage of serfdom, and gained personal freedom—thus, the initial form of capitalism emerged.

After the French Revolution, the institutional framework and economic system of capitalism were basically established. During this period, typical modern capitalist operation methods such as equity trading gradually emerged, laying an institutional and market foundation for the further development of capitalism.

The arrival of the Age of Discovery gave a huge boost to the development of capitalism. Capitalists in developed European countries were able to use cheap labor in colonies to produce goods and export these goods to all parts of the world. This allowed them to obtain more substantial trade profits, accelerating the primitive accumulation of capital and the expansion of markets.

However, there are different views on the origin of capitalism. Some documents point out that the embryonic form of capitalism may have appeared in ancient Greece (Yardımcı, 2019). It should be noted, however, that ancient Greece and Rome were slave societies, where the economy was mainly created by slaves. Slaves lacked personal freedom, which was significantly different from the key feature of capitalist society—where wage workers have free status.

Since the Industrial Revolution in the 18th century, technological development has become the core driving force behind the development of modern capitalism. The invention and application of the steam engine greatly reduced production costs, and some production links could even be completed without manual operation. At the same time, the widespread use of large-scale machinery significantly improved production efficiency, making it easy to manufacture many products that were previously difficult to produce, and many innovative products also emerged.

During this period, the discovery of basic physical principles provided theoretical support for technological progress. For example, the discovery of the Carnot cycle (Feidt, 2020) promoted the invention of equipment such as refrigerators and air conditioners, further enriching the material production and consumption of capitalist society.

The contribution of capitalist society to human civilization is also reflected in the continuous technological revolutions. After the 18th-century Industrial Revolution, the 21st century witnessed the Information Technology Revolution (Webster, 2014). In industrial production, information transmission became a key production factor, and the Information Technology Revolution gave rise to the knowledge economy. The traded products of capitalist society were no longer limited to industrial products; knowledge and information products also occupied an important position.

Entering the 2020s, the artificial intelligence revolution, marked by artificial intelligence technology, is advancing in depth (Makridakis, 2017; Floridi, Cowls, Vayena, et al., 2018), showing great application potential. The artificial intelligence revolution will trigger profound changes in social structure, such as changes in energy efficiency. The huge energy consumption of generative artificial intelligence (Georgiev & Plumed, 2021) has aroused widespread concern about energy issues. With population growth, the problem of global climate change caused by energy consumption has become increasingly severe, prompting people to focus on green energy production. It is believed that this will promote the energy revolution, such as the maturity of technologies like nuclear fusion. The development of technologies such as nuclear fusion may allow human society to expand into cosmic interstellar space. Just like the Age of Discovery back then, the scope of trade is expected to extend to the Milky Way beyond the solar system, bringing exciting prospects for the development of capitalism.

Although the Industrial Revolution, the Information Technology Revolution, and the upcoming Artificial Intelligence Revolution have promoted the development of capitalism, they cannot change its class contradictions and fundamental social contradictions.

In modern information society, the class contradictions of capitalism still exist and have become more acute in some regions, mainly manifested in the problem of the wealth gap and the international North-South gap (Broad, 1996). The fundamental social contradiction of capitalism—the contradiction between the socialized large-scale production and the private ownership of the means of

production—remains deeply rooted in the information society. The frequent economic and financial crises worldwide are manifestations of this contradiction, such as the 2000 Internet bubble (Lam, 2002) and the 2007-2008 U.S. subprime mortgage crisis (Reinhart & Rogoff, 2008).

The 2000 Internet bubble originated from investors' overestimation of the capabilities of the Internet. A large number of Internet companies lacking actual economic benefits emerged and eventually went bankrupt because they could not make profits. The 2007-2008 U.S. subprime mortgage crisis was caused by people's unrealistic demand for housing, which led to inflated housing prices that could not be supported by actual demand. The value of subprime mortgages plummeted, causing heavy losses to both ordinary people and capitalists, and even triggering the "Occupy Wall Street" movement (Calhoun, 2013).

To address these issues, capitalist societies have continuously made self-adjustments, introducing various social welfare systems, which have alleviated social problems caused by economic issues to a certain extent. Currently, relevant laws and regulations are still under continuous exploration and practice.

4.5.1. Evolution and Development of the European and North American Monetary Systems

The history of European and North American currencies can be traced back to ancient Greece and Rome. At that time, precious metals such as gold and silver were the main materials for coinage, which was closely related to Europe's early engagement in precious metal trading. During this period, precious metal currencies dominated.

After the 16th century, influenced by the use of paper money in China, the embryonic form of paper money began to appear in Europe. Initially, notes issued by goldsmiths could be used as a medium of exchange, gradually forming the prototype of early European paper money (Horsefield, 1977). Unlike the paper money of the Song Dynasty in China, these notes were directly pegged to precious metals such as gold and silver, reflecting their dependence on precious metals.

In the early 18th century, France took the lead in formally conducting paper money experiments on the European continent (Bonney, 2001). In the following decades, Britain also followed suit and issued its own paper money. The issuance of paper money during this period marked an important transition of European currency forms from precious metals to credit money.

After the 19th century, the modern monetary system was gradually established in Europe. To stabilize the currency value, the gold standard system emerged (Knafo, 2006). Under this system, gold became a key element in stabilizing the currency, and the value of paper money was directly pegged to the value of gold. When the face value of paper money exceeded the price of gold, gold could be sold; when the face value of paper money was lower than the price of gold, gold was purchased back from the market. Through this mechanism, the stability of the paper money value was guaranteed to a certain extent.

However, the gold standard system had inherent limitations. Paper money is flexible and printable, so when a country faces special needs or the world situation is turbulent, this system is difficult to maintain. For example, after the outbreak of World War I in the 1920s, countries printed a large amount of paper money to quickly supplement military expenditures (Ebeling, 2008), leading to the rapid collapse of the gold standard system.

After the end of World War II, the Bretton Woods system was established to rebuild the world financial order (Kenen, 2008). During the two world wars, the United States suffered relatively little damage; its capitalist system and industrial production chain were not severely destroyed. Instead, it accumulated huge wealth by selling weapons and other means, and a large amount of gold flowed into the United States. Based on this, the Bretton Woods system established a monetary system where the U.S. dollar was pegged to gold and other countries' currencies were pegged to the U.S. dollar. In essence, it was still a gold standard monetary system, aiming to restore the gold standard system that had operated well since the 19th century.

However, this system faced a severe challenge: the U.S. national strength could not remain leading for a long time. After World War II, countries severely

damaged such as Europe and Japan recovered rapidly (Bhuiyan, 2019), with their economies growing rapidly, while the economic strength of the United States relatively declined. Against this background, then U.S. President Nixon abolished the monetary system where the U.S. dollar was pegged to gold (Zoeller & Bandelj, 2019), marking the complete end of the gold standard era. Humanity entered the era of credit money, where the exchange rate of the U.S. dollar was no longer pegged to gold, and the currencies of other countries in the world adopted a floating exchange rate system. Currency exchange rates fluctuate with market demand, leading to depreciation and appreciation, which have a significant impact on the economic development of various countries. For example, in the 1980s, under the pressure of the Plaza Accord (Frankel, 2015), the Japanese yen appreciated rapidly, leading to Japan's economic stagnation; in the 1990s, the British currency was forced to be pegged to the U.S. dollar despite the country's poor economic conditions, and depreciated sharply under the attack of hedge funds, severely damaging the British financial system (Taketa, 2004). Against this background, the euro emerged (Solomon, 1999), forming a situation of mutual competition with the U.S. dollar.

In the 21st century, with the development of Internet encryption technology, cryptocurrencies such as Bitcoin have emerged as a new form of currency (Nakamoto, 2008; Böhme, Christin, Moore, et al., 2015). Different from traditional national legal tender, cryptocurrencies are not managed by a central bank, exist widely on the Internet, and adopt high-intensity encryption algorithms. Even if computer technology makes breakthroughs in the future, it will be difficult to crack the encrypted information, so cryptocurrencies have high security.

Cryptocurrencies do not require centralized management by a central bank and can be permanently owned by individuals on the Internet, becoming a type of currency that can be held freely. Currently, cryptocurrencies are widely used around the world, occupying a certain share in the commodity trading market, and their application scenarios are becoming increasingly extensive. The widespread application of cryptocurrencies indicates that the operation mode of capitalist society may undergo revolutionary changes. However, the specific impact

of this new type of currency on capitalist society still requires more theoretical and practical research for in-depth understanding.

4.5.2. The Proletariat in Europe and North America

Ancient Europe, including ancient Greece and Rome, was in a slave society (Yavetz, 1988). In this social system, slaves were the main force in creating wealth. Although slaves also belonged to the category of proletarians, they had no personal freedom at all. Therefore, there was a very significant difference between the proletarians in slave society—slaves, and the working class in capitalist society.

The embryonic form of the proletariat with real personal freedom first appeared in Italy in the 14th century (Vigo, 1974). At that time, capitalism sprouted, and some workshop owners began to hire landless farmers for production. These wage workers became representatives of the early proletariat. However, the scale of the proletariat during this period was still small, and its impact on society was relatively limited. It was not until the 15th and 16th centuries that the Age of Discovery opened the door to the New World for colonialists (Arnold, 2013), allowing them to plunder massive resources and products from the colonies. This change led to the emergence of a large number of proletarians both in the colonies and in Europe and North America. They no longer relied on land for a living; instead, they turned to factories run by capitalists and worked hard to earn wages for their livelihood. In the 18th century, the famous Enclosure Movement in Britain pushed this trend to a climax (Wordie, 1983). Landowners enclosed land and converted it into pastures for sheep, in order to obtain wool raw materials needed by textile factories. Farmers who originally cultivated on this land were forced to become homeless, becoming a social group that had no means of production but was completely free. They had to flock to cities and factories, accept employment by capitalists, and engage in industrial production. This phenomenon was vividly described by Thomas More as the cruel social reality of "sheep devouring men" (Kautsky & Stenning, 1959). At this time, the working class also broke away from traditional shackles more thoroughly, becoming the early form of the modern proletariat.

The growth of the working class in Europe and North America was mainly due to the rise of the Industrial Revolution. During this period, the widespread application of machines led to a surge in capitalists' demand for labor to meet the needs of operating machine production. This seems to contradict the logic that machines replace manual labor, but in fact, it does not. With the widespread use of machines, the output of factories—such as textiles—increased rapidly, and the social demand for cheap textiles also expanded accordingly, which in turn required more workers to operate machines. However, in the early stage of the Industrial Revolution, relevant laws and regulations failed to keep up, resulting in many workers facing long working hours and meager wages. Female workers even had to work continuously for more than ten hours but could only barely maintain their basic survival, while the surplus value they created all fell into the hands of capitalists (Hopkins, 1982).

The advancement of the Industrial Revolution not only drove the rapid development of technology but also gave birth to more industrial chains, thereby increasing the demand for workers. As the number of the working class continued to expand, they gradually formed a powerful social force. At the same time, theories about the working class also emerged (Post, 2010), among which Marx's theory was the most famous (Andrew, 1975), speaking out for the working class. On this basis, the international communist movement developed vigorously, and various working-class organizations emerged in European and North American countries (Reid, 1987), including trade unions, communist movement teams, and proletarian theorists. In addition, the proletariat also established its own political parties, which was not seen in other forms of capitalism in history.

Although some countries established proletarian regimes through violent revolutions (Mayer, 2013), such as Russia and some Eastern European countries, even in countries where no proletarian revolution occurred, the social system was constantly changing in a direction beneficial to the proletariat. This included the implementation of various welfare systems and measures to improve the living and working conditions of the working class (Chen, 2002), such as shortening working hours and increasing holidays. In some developed countries, the working hours have been shortened to four and a half days a week, and the

development of information technology has even allowed many workers to work from home, effectively improving working conditions. These positive changes have alleviated the class contradictions in capitalist society to a certain extent.

4.5.3. The Rule of the Bourgeoisie in Europe and North America

In ancient Greece and Rome, society was mainly ruled by slave owners. After entering the feudal society of the Middle Ages, the ruling power was transferred to feudal landlords and the church. It was not until the rise of capitalist society that capitalists gradually stepped onto the political stage. However, this process was not achieved overnight. In European history, there were endless conflicts, and the introduction of new systems always encountered resistance from the old vested interests. Therefore, the rise of capitalists on the historical stage was a gradual process. In the early days, although capitalists owned handicraft factories and huge domestic and foreign markets, and the capitalist group—including workshop owners, merchants, bankers, and various professionals—had accumulated huge wealth and knowledge management skills, they still lacked corresponding political rights and status. The church and serf owners in the Middle Ages suppressed them severely (Courtenay, 1989). With the arrival of the Age of Discovery, a large number of ship owners and capitalists benefited greatly and formed alliances with monarchs of various countries to promote the implementation of mercantilist policies, thereby enhancing the status and voice of capitalists in society (Andrien, 2016).

Different from the rule of feudal serf owners and the church in the Middle Ages, the European bourgeoisie were mostly knowledgeable professionals. At the ideological level, they began to emphasize demands such as personal rights and democracy, and put forward important reform measures for the religious rule of the Middle Ages, giving birth to the famous Renaissance (Burke, 1997). Driven by the Renaissance, various new theories emerged one after another, and religion also underwent a major reform (Howe, 1988). The emergence of Protestant Christianity provided ethical justification for activities pursuing secular wealth (Freston, 2008), greatly weakening the unified authority of the Catholic Church. The Enlightenment was an important starting point of the bourgeois movement

(Bristow, 2017) and an important symbol of the bourgeoisie moving towards political dominance. During the Enlightenment, the bourgeoisie put forward core political governance concepts such as natural rights, social contract, popular sovereignty, and separation of powers, providing theoretical support and a framework for overthrowing feudal dynasties.

After the Renaissance and the Enlightenment, capitalist movements in various European countries flourished. The social system underwent fundamental changes, and social movements became a symbol of the growing strength of capitalist forces in Europe. To accelerate social reform, some countries adopted capitalist revolutionary methods such as violent revolution, among which the French Revolution lasted for ten years. During the French Revolution, the *Declaration of the Rights of Man and of Citizens* (Johnson, 1990) was issued, proclaiming capitalist core concepts such as freedom, property, security, and resistance to oppression as inalienable human rights, popular sovereignty, and equality before the law. It completely overthrew the feudal privilege system. Since then, the status and rights of the bourgeoisie have been established through violent revolution, dealing a heavy blow to the rule of feudal serf owners.

Based on the capitalist revolutions in the 17th and 18th centuries, the capitalist political system was widely established and consolidated in Europe after the 19th century. The Napoleonic Wars and the *Napoleonic Code* (Lobingier, 1918)—a typical bourgeois code—established principles such as the right to private property, equality before the law, and freedom of contract, and spread them to all parts of Europe. This objectively ended the local feudal system and paved the way for the capitalist legal system. A revolution sweeping across Europe broke out in 1848 (Sperber, 2005), whose main demands included bourgeois political programs such as national unification, constitutional democracy, and personal freedom. The constitutional monarchy was established in Britain (Bogdanor, 1995), realizing the diversification of the political system and demonstrating the diversity of the bourgeois political model. These changes greatly promoted the development of the bourgeois economy, and the political universal suffrage system provided an opportunity for the bourgeoisie to gain the support of the working class (Duong, 2020), thereby alleviating the contradiction between the

bourgeoisie and the working class to a certain extent. Universal suffrage occupies a dominant position in the modern capitalist system, reflecting the maturity of the capitalist system.

As the capitalist system became increasingly mature, modern capitalists have been able to better use the capital at their disposal to control the entire society. They usually exercise control through methods such as investment and equity trading. In American society, a small number of Wall Street capitalists can control the stocks of a large number of listed companies on the New York Stock Exchange and NASDAQ by virtue of their large amount of capital (Geisst, 2018). Through large capital investment, they can push the stock prices of start-ups developing new technologies to a high level, thereby enabling these companies to obtain better financing opportunities. In the stage where new technologies have not yet developed rapidly but require a large amount of capital, these promising companies can achieve rapid growth with continuous capital investment, thereby dominating the technological development of the entire society and guiding the progress of capitalist society. Of course, in the political development of some third-world countries, capitalists can also influence and manipulate the political development of these countries through large capital investment (Sudetic, 2011).

4.5.4. Relations of Production in Europe and North America

From the perspective of ownership, it is beyond doubt that European and North American societies operate under a private ownership system. However, due to the large number of European countries, there are still significant differences in terms of ownership. Private ownership in the United Kingdom places greater emphasis on individualism and free-market principles regarding private property rights, with minimal government intervention in the economy. Through systems such as equity trading, the liquidity of personal property in the United Kingdom and the United States is relatively high. In contrast, private ownership on the European continent differs from that in the UK and the US, with notable variations among individual countries. From a mainstream perspective, Northern Europe and Eastern Europe tend to lean towards state-owned public

ownership. For instance, in Norway, the state holds 25% of the market value of listed companies on the Oslo Stock Exchange and controls listed companies accounting for over half of the total market value (Christensen, 2022). In contrast, the ownership of listed companies in the UK and the US is much more dispersed. Western Europe and Southern Europe are more inclined towards private ownership; yet, compared with the UK and the US, private ownership in these regions sees a higher concentration of shares in large companies and families. Particularly in two major Western European countries—Germany and France—their private ownership systems exhibit distinct characteristics (Fohlin, 2005). Generally speaking, modern European and North American capitalism emphasizes the protection of private property rights while also attaching great importance to social partnerships, such as trade unions and enterprise employees. This implies that even under private ownership, the property of a company belongs not only to its shareholders but also to its employees.

This stands in stark contrast to both ancient and modern China. After the establishment of the Zhou Dynasty in ancient China, the country was governed under the concept that "all lands under heaven belong to the monarch." All land in the country was owned by the state and then enfeoffed to various vassals and landlords. This state-owned land governance concept persisted in subsequent dynasties of ancient China. During the Song Dynasty, driven by industrial development and the germination of capitalist society, land gradually exhibited certain features of private ownership. Nevertheless, the concept of state-owned land did not completely disappear and was further strengthened in later dynasties. The differences in private ownership between Europe/North America and ancient/modern China primarily stem from the distinct cultural backgrounds of the two regions. The European continent has long been in a state of division, with intense conflicts among various vassals and ethnic groups. Consequently, it is understandable that different countries and ethnic groups hold varying perspectives. It is precisely due to this fragmented state of nations and ethnicities that the theoretical analysis of private ownership has advanced rapidly in the European continent (including the UK and the US). After all, this is a crucial issue that must be urgently addressed in the development of capitalism in

Europe and North America. Therefore, in Europe and North America, the protection of private property rights is usually enshrined in law. Currently, the constitutions and relevant private property protection laws of some European and North American countries contain clear definitions of private property and a series of legal provisions for its protection. This constitutes an important characteristic of European and North American capitalism and reflects their in-depth understanding and analysis of the ownership of the means of production—a key aspect of relations of production—at the theoretical level.

In terms of the relationship between capitalists and wage workers, capitalists in the early stages of European and North American capitalist societies were solely profit-driven, often subordinating moral constraints to interests. As Marx put it: "Capital comes into the world, from head to toe, with every pore dripping blood and filth" (Allen, 2022). This accurately depicts the relationship between capitalists and wage workers in the early days of European and North American capitalism. However, with the development of capitalism in Europe and North America, and the deepening understanding of capitalist economic models, industrial technology, and scientific technology—especially the nature of capitalism—people began to recognize various problems in the development of capitalism, particularly the relationship between capitalists and wage workers. After capitalists, driven purely by profit, brutally exploited workers' surplus value and triggered social unrest, many proletarian theorists proposed corresponding solutions. These included the establishment of trade unions to safeguard workers' rights (Levine, 2000), the provision of workers' pensions to ensure that workers could support themselves in old age (Andersson & Eriksson, 2015), the enactment of laws requiring capitalists to shorten working hours and grant more vacation time (Brooks, 1956), and the implementation of employee stock ownership plans in some large enterprises (Kim & Ouimet, 2014). These measures enabled workers to act not only as proletarians employed by enterprises but also to share more profits from enterprise development, effectively improving their living standards. These improvements have alleviated the contradictions between capitalists and workers and provided a guarantee for the stable development of capitalism.

Of course, even in the developed capitalist societies of Europe and North America, their welfare systems have, to a certain extent, effectively guaranteed the basic livelihoods of the working class. Nevertheless, capitalists still seize the vast majority of profits in the end, and the exploitation of workers' surplus value persists, albeit in a more concealed form. Even when enterprises adopt employee stock ownership plans, ordinary workers, as part of the broad labor force, hold only a tiny fraction of the shares. As a result, the benefits they receive from the development of the enterprise are extremely limited.

4.5.5. The October Revolution and the Two World Wars

Although the economies of developed capitalist countries have achieved significant development, and various welfare measures and labor protection policies have effectively alleviated the contradictions and conflicts between capitalists and the proletariat, this situation is actually similar to that of capitalism in China's Song Dynasty. These developed capitalist countries in Europe and North America have achieved rapid industrial and trade development; however, in this process, they have essentially transferred various crises—including economic crises—triggered by the contradictions between the bourgeoisie and the proletariat in the past to relatively poor third-world countries. Consequently, class contradictions still exist and even become extremely acute at times. At the beginning of the 20th century, Russia witnessed the outbreak of the October Revolution due to the intensification of capitalism's fundamental contradictions (Suny, 1983). After the October Revolution, the international communist movement spread rapidly (Degras, 2013), and socialist systems were generally established in Eastern European societies. This clearly reflects the consequences of the intensification of internal contradictions within capitalism.

Compared with developed capitalist countries in Europe and North America, the development of capitalism in Russia was relatively backward. Precisely due to the fundamental contradictions of capitalism, various resources in backward countries continued to flow to developed capitalist countries, triggering problems of resource loss and trade conflicts with developed countries, which further weakened the overall national strength of these backward countries. In the Russo-Japanese War (Westwood, 1986), Russia suffered a crushing defeat due to

its declining national strength, which aroused strong dissatisfaction among the domestic people. Eventually, the Bolsheviks (i.e., the proletarian party) led by Lenin overthrew the capitalist rule of the Tsarist Russian Empire and established a new Soviet socialist system (Pipes, 2018). The concept of this proletarian regime spread continuously to regions such as Eastern Europe and Asia, triggering violent turbulence and changes in the international community.

In addition to the proletarian regime established by the October Revolution, within the European continent itself, the influence of factors such as the fundamental contradictions of capitalist society also led to the outbreak of the two World Wars. In fact, this was caused by contradictions among the bourgeoisie of different countries on the European continent, reflecting the complexity of contradictions in capitalist society. These contradictions not only involve the fundamental contradiction between the bourgeoisie and the proletariat but also include conflicts of interest and distribution among different ethnic groups and countries. Before World War II, the world experienced an economic crisis of varying degrees—the Great Depression of 1929 (Matés-Barco, 2023). This economic depression triggered trade imbalances around the world and became the root cause of disputes between different countries. Many developed countries issued large amounts of banknotes to supplement their national defense expenditures, deviating from the basic requirements of the gold standard, which ultimately led to severe inflation. To export inflation, these countries had to shift the crisis to other surrounding countries, which also served as one of the important causes of World War II.

After the end of World War II, the United Nations was established to address these imbalances (Gareis, 2012). It provided the entire international community—whether poor or wealthy countries—with a supreme management or guidance body, effectively coordinating relations between wealthy and poor countries. This resolved serious issues such as the transfer of economic crises and inflation from developed capitalist countries to poor countries, effectively alleviating contradictions between developed and poor countries, and also helping to resolve internal contradictions within poor countries. In 1947, the General Agreement on Tariffs and Trade (GATT) was formulated (Mavroidis, 2005), which

effectively coordinated tariff relations and trade balances among countries around the world and eliminated trade barriers. As a multilateral trade agreement, GATT was formally transformed into the World Trade Organization (WTO) in 1995 (Krueger & Aturupane, 1998), laying a solid foundation for eliminating tariff barriers and achieving trade balance worldwide. After World War II, to restore monetary credit, the Bretton Woods system was introduced (Kenen, 2008). Through this system, the US dollar was pegged to gold, which to a certain extent quickly restored the economy damaged by World War II and laid an important foundation for the economic development of other countries around the world after the war. Of course, in terms of national management systems, the important role of the socialist system in solving capitalist problems was also recognized. Measures such as state intervention were introduced to regulate the laissez-faire market economy in the entire international trade system in a planned manner, while increasing protection for the interests of the proletariat. Practice has proven that these measures have indeed played a crucial role in establishing a new world order after World War II.

References

[1] Alexander. D. M. (1885). History of Money in China. American Journal of Numismatics, and Bulletin of the American Numismatic and Archaeological Society, 19(4), 73-78.

[2] Allen, A. (2022). Dripping with Blood and Dirt from Head to Toe: Marx's Genealogy of Capitalism in Capital, Volume 1. The Monist, 105(4), 470-486.

[3] Andersson, L. F., & Eriksson, L. (2015). The Compulsory Public Pension and the Demand for Life Insurance: The Case of Sweden, 1884-1914. The Economic History Review, 68(1), 244-263.

[4] Andrew, E. (1975). Marx's Theory of Classes: Science and Ideology. Canadian Journal of Political Science/Revue Canadienne De Science Politique, 8(3), 454-466.

[5] Andrien, K. J. (2016). Age of Exploration, C. 1500-1650. In The Ashgate Research Companion to Modern Imperial Histories (pp. 15-39). Routledge.

[6] Arnold, D. (2013). The Age of Discovery, 1400-1600. Routledge.

[7] Ball, J., & Levey, R. H. (2006). Ancient China: Archaeology Unlocks the Secrets of China's Past. National Geographic Books.

[8] Bao, Y. (鲍音) (1993). 论蒙金战争的性质及其历史作用. 赤峰学院学报: 汉文哲学社会科学版, (Z1), 11-18.

[9] Bhuiyan, M. Z. A. (2019). The Miracle of Japanese Economy after the Second World War (WW2). ResearchGate.

[10] Bickford, M. (2006). Huizong's Paintings: Art and the Art of Emperorship. In Emperor Huizong and Late Northern Song China (pp. 453-513). Harvard University Asia Center.

[11] Boaretto, E., Wu, X., Yuan, J., Bar-Yosef, O., Chu, V., Pan, Y., et al. (2009). Radiocarbon Dating of Charcoal and Bone Collagen Associated with Early Pottery at Yuchanyan Cave, Hunan Province, China. Proceedings of the National Academy of Sciences, 106(24), 9595-9600.

[12] Bogdanor, V. (1995). The Monarchy and the Constitution. Oxford University Press.

[13] Böhme, R., Christin, N., Edelman, B., & Moore, T. (2015). Bitcoin: Economics,

Technology, and Governance. Journal of Economic Perspectives, 29(2), 213-238.

[14] Bonney, R. (2001). France and the First European Paper Money Experiment. French History, 15(3).

[15] Li, B. Q. (2012). Implications of Large Burial Sites of Songze Culture. Social Sciences in China, 33(2), 133-141.

[16] Bristow, W. (2017). Enlightenment. Stanford Encyclopedia of Philosophy. https://plato.stanford.edu/eNtRIeS/enlightenment/

[17] Broad, R. (1996). Whither the North-South Gap? Third World Quarterly, 17(1), 7-18.

[18] Brooks, G. (1956). History of Union Efforts to Reduce Working Hours. Monthly Labor Review, 1271-1273.

[19] Bulling, A. G. (1977). A Late Shang Place of Sacrifice and Its Historical Significance. Expedition, 19(4), 4.

[20] Burke, P. (1997). The Renaissance. Bloomsbury Publishing.

[21] Calhoun, C. (2013). Occupy Wall Street in Perspective. British Journal of Sociology, 64(1), 26-38.

[22] Cameron, J., & Sun, G. (2022). Textile Production and Craft Specialisation at Tianluoshan in the Lower Yangzi Valley. Antiquity, 96(389), 1124-1141.

[23] Chang, K. C. (1995). On the Meaning of Shang in the Shang Dynasty. Early China, 20, 69-77.

[24] Chang, L. H. (1993). Cross-Cultural Musical Processes and Results. Music along the Silk Route (From Second Century BC to Tenth Century AD). Revista De Musicología, 16(4), 1888-1895.

[25] Chang, W. C. (2016). Along the River during the Qingming Festival. 天行書苑.

[26] Palace Museum (2024). [张择端 清明上河图 卷]. https://www.dpm.org.cn/collection/paint/228226.html

[27] Zhang, C. P., & Wu, G. (2024). Sanxingdui and Ancient Chinese Civilization: In Conversation with Zhang Changping. In The Civilization of China and the

Civilizations of the World (pp. 233-259). Singapore: Springer Nature Singapore.

[28] Chen, F. (2024). The Private Imperial Banquets of Emperor Taizu's Reign in the Song Dynasty and Their Political Functions. Frontiers of History in China, 19(4).

[29] Chen, J. L. (陈景良) (2017). 何种之私: 宋代法律及司法对私有财产权的保护. 华东政法大学学报, 20(3), 139-154.

[30] Chen, K., Jiao, Y., & Li, G. (2025). The Reform of Tax Policies and the Differentiation of Chinese Peasants during the Tang and Song Dynasties. Labor History, 1-17.

[31] Chen, S. (2002). State Socialism and the Welfare State: A Critique of Two Conventional Paradigms. International Journal of Social Welfare, 11(3), 228-242.

[32] Cheng, Z. (2024). Liangzhu Civilization. Scientific Research Publishing, Inc.

[33] Childs-Johnson, E. (2019). Jade Age Adornment of the Liangzhu Elite. In The Art and Archaeology of Bodily Adornment (pp. 141-160). Routledge.

[34] Christensen, S. A. (2022). Capitalism and State Ownership Models. In Evolutions of Capitalism (pp. 73-99). Bristol University Press.

[35] Courtenay, W. J. (1989). Inquiry and Inquisition: Academic Freedom in Medieval Universities. Church History, 58(2), 168-181.

[36] De Crespigny, R. (2010). Imperial Warlord: A Biography of Cao Cao 155-220 AD (Vol. 99). Brill, 3.

[37] Degras, J. (2013). Communist International: Documents. Routledge.

[38] Diao, P. J. (刁培俊) (2013). 官治、民治规范下村民的"自在生活"——宋朝村民生活世界初探. 文史哲, (4), 95-108.

[39] Dickinson, W. B. (1862). On Chinese Knife Money. The Numismatic Chronicle and Journal of the Numismatic Society, 2, 213-218.

[40] Dong, B. (董兵) (2000). 商代军队编制与兵种研究. 博士学位论文, 郑州大学. 4-5.

[41] Douglas, J. G. (2005). A Review of Some Recent Research on Early Chinese Jades. In Scientific Examination of Art: Modern Techniques in Conservation and

Analysis, from the Arthur M. Sackler Colloquia of the National Academy of Sciences (pp. 206-214). The National Academies Press, Washington, DC.

[42] Du, B., & Liang, Y. (2024). The Development and Evolution of Ancient Chinese Musical Instruments. Material Science, 6(7), 46-51.

[43] Duong, K. (2020). What Was Universal Suffrage? Theory & Event, 23(1), 29-65.

[44] Ebeling, R. M. (2008). The Lasting Legacies of World War I: Big Government, Paper Money and Inflation. Economic Education Bulletin-American Institute of Economic Research, 48(11), 1-8.

[45] Eno, R. (2009). Shang State Religion and the Pantheon of the Oracle Texts. Early Chinese Religion, Part One: Shang Through Han (1250 BC-220 AD), 41-102.

[46] Fang, X., & Wang, L. (2022). Fanshan Royal Cemetery. Springer Singapore.

[47] Feidt, M. (2020). Carnot Cycle and Heat Engine: Fundamentals and Applications. Entropy, 22(3), 348.

[48] Feng, N. (2005). Copyright Protection in Song China (960-1279). Master's Thesis, University of British Columbia.

[49] Luan, F. S. (2013). The Dawenkou Culture in the Lower Yellow River and Huai River Basin Areas. A Companion to Chinese Archaeology, 411-434.

[50] Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., et al. (2018). AI4People—An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations. Minds and Machines, 28(4), 689-707.

[51] Fohlin, C. (2005). The History of Corporate Ownership and Control in Germany. In A History of Corporate Governance Around the World: Family Business Groups to Professional Managers (pp. 223-282). University of Chicago Press.

[52] Foster, C. J. (2021). Xuanquanzhi. The Encyclopedia of Ancient History: Asia and Africa, 1-2.

[53] Yang, J. (2015). Transportation, Boarding, Lodging, and Trade along the Early Silk Road: A Preliminary Study of the Xuanquan Manuscripts. Journal of American Oriental Society, 135(3), 421-432.

[54] Foster, R. (2018). The Southern Song Dynasty. In Routledge Handbook of Imperial

Chinese History (pp. 197-212). Routledge.

[55] Frankel, J. (2015). The Plaza Accord, 30 Years Later (No. W21813). National Bureau of Economic Research.

[56] Freston, P. (2008). Christianity: Protestantism. In Routledge Handbook of Religion and Politics (pp. 38-59). Routledge.

[57] Fu, C., & Cao, W. (2019). Urban Development over the Spring and Autumn and Warring States Periods. In Introduction to the Urban History of China (pp. 79-90). Singapore: Springer Nature Singapore.

[58] Fu, P. W. (付鹏伟) (2013). 宋朝商税管理机构研究. 硕士学位论文, 山东大学.

[59] Gan, F. (2009). Ancient Glass Research along the Silk Road. World Scientific, 41-108

[60] Gan, F. (2013). The Glass and Jade Road—The Cultural and Technical Exchange of Silicate Based Artefacts with Foreign Countries Before Qin Dynasty. Journal of the Chinese Ceramic Society, 41(4), 458-466.

[61] Gao, C. M. (2024). 高聪明: 千年前的"货币革命"——论宋代国家纸币的产生及其历史意义. 光明日报, 2024-01-22(14 版).

[62] Gao, W. H. (高文虹) (2008). 崧泽文化社会形态的研究——以太湖流域为中心. 硕士学位论文, 上海大学.

[63] Gareis, S. B. (2012). The United Nations. Bloomsbury Publishing.

[64] Ge, J. F., & Chang, Z. J. (葛金芳, & 常征江) (2008). 宋代"钱荒"成因再探. 湖北大学学报: 哲学社会科学版, 35(2), 7.

[65] Geisst, C. R. (2018). Wall Street: A History. Oxford University Press.

[66] Georgiev, R. D., & Plumed, F. M. (2021). Analysis of Deep Learning Inference Compute and Energy Consumption Trends. Escuela Técnica Superior de Ingeniería Informática Etsinf, Universitat Politècnica de València, Valencia, Spain.

[67] Guan, K. C. (2016). The Maritime Silk Road: History of an Idea. Nalanda-Sriwijaya Centre Working Paper, 23.

[68] Guo, H. Y. (郭弘宇) (2014). 宋朝纸币发行制度探究. 经济视野, (13), 1.

[69] Guo, Y. F. (郭玉峰) (2012). 宋代手工业雇佣劳动研究. 硕士学位论文, 陕西师范大学, 13-21, 25-31.

[70] He, J. Q. (何俊谦) (2020). 殷墟墓地人口复原及殷墟都城人口规模的蠡测. 古代文明(辑刊).

[71] Hopkins, E. (1982). Working Hours and Conditions during the Industrial Revolution: A Reappraisal. Economic History Review, 52-66.

[72] Horsefield, J. K. (1977). The Beginnings of Paper Money in England. Journal of European Economic History, 6(1), 117.

[73] Howe, J. (1988). The Nobility's Reform of the Medieval Church. The American Historical Review, 93(2), 317-339.

[74] Hozumi, F. (1954). The Characteristics of the History of Chinese Money. Kyoto University Economic Review, 24(2), 18-38. http://www.jstor.org/stable/43217017

[75] Hu, H. X., & Hu, Z. Y. (胡厚宣, & 胡振宇) (2019). 殷商史. 上海人民出版社有限责任公司.

[76] Huang, J. Y., & Wang, F. C. (黄今言, & 王福昌) (2003). 汉代农业商品生产的群体结构及其发展水平之评估. 中国社会经济史研究, (1), 1-10.

[77] Huang, P. M. (皇甫謐) (2010). 帝王世纪. 齐鲁书社. https://www.kandianguji.com/book_detail?book_id=100942

[78] Huang, W. C. (黄伟城) (1980). 试论奴隶社会并非阶级社会首先必经的历史阶段兼论商朝不是奴隶社会(下). 广西民族大学学报: 哲学社会科学版, (3), 52-59.

[79] Jiang, L., Liang, Q., Qi, Q., Ye, Y., & Liang, X. (2017). The Heritage and Cultural Values of Ancient Chinese Maps. Journal of Geographical Sciences, 27(12), 1521-1540.

[80] Tang, J. G. (2008). The Yinxu Museum: The Ruins of Yin and the Yin-Shang Culture. Museum International, 60(1-2), 132-139.

[81] Jin, X., Liao, Z., & Zhou, Z. (2024). Aesthetic Exploration of Jade Artifacts from Songze Culture. In 2024 10th International Conference on Humanities and Social

Science Research (ICHSSR 2024) (pp. 1058-1067). Atlantis Press.

[82] Johnson, V. R. (1990). The Declaration of the Rights of Man and of Citizens of 1789, the Reign of Terror, and the Revolutionary Tribunal of Paris. BC Int'l & Comp. L. Rev., 13, 1.

[83] Johnston, M. (2022). Chinese Knife Money: Making Markets Feel Murderous? History—Ancient Traditions. Ancient Origins. https://www.ancient-origins.net/history-ancient-traditions/knife-money-0017193

[84] Katō, S. (加藤繁) (2006). 唐宋时代金银之研究: 以金银之货币机能为中心. 中华书局.

[85] Kautsky, K., & Stenning, H. J. (1959). Thomas More and His Utopia (p. iii). New York: Russell & Russell.

[86] Kenen, P. B. (2008). Bretton Woods System. In The New Palgrave Dictionary of Economics (pp. 1-9). Palgrave Macmillan, London.

[87] Kim, E. H., & Ouimet, P. (2014). Broad-Based Employee Stock Ownership: Motives and Outcomes. The Journal of Finance, 69(3), 1273-1319.

[88] Knafo, S. (2006). The Gold Standard and the Origins of the Modern International Monetary System. Review of International Political Economy, 13(1), 78-102.

[89] Kong, L. (2024). The Demise of the Spirit of Primitive Federalism of Confucianism: From Duke of Zhou, Confucius to Dong Zhongshu.

[90] Krueger, A. O., & Aturupane, C. (1998). The WTO as an International Organization. University of Chicago Press.

[91] Łakomska, B. (2012). The Origins of Collecting in China. Underground Jade Treasures as a Reflection of Ancient Collecting. Art of the Orient, 1, 29-30.

[92] Lam, P. L. (2002). The Making and Bursting of the Internet Bubble. Info, 4(2).

[93] Jiang, L. P. (2013). The Kuahuqiao Site and Culture. A Companion to Chinese Archaeology. 535-554.

[94] Levine, P. (2000). The Legitimacy of Labor Unions. Hofstra Lab. & Emp. LJ, 18, 529.

[95] Levy, H. S. (1956). Yellow Turban Religion and Rebellion at the End of Han. Journal of the American Oriental Society, 76(4), 214-227.

[96] Li, H. F., & Zhao, Y. C. (李鸿飞, & 赵永春) (2010). 试论"绍兴和议"的签订. 北华大学学报(社会科学版), 11(6), 16-19.

[97] Li, H. G. (李湖光) (2024). 战天下: 女真崛起与宋辽金战争. 现代出版社.

[98] Li, J. M. (李建民) (2025). 东汉干饭图鉴 | 古人的聚餐仪式感, 藏在这些餐具里! Sichuan University Museum. https://sum.scu.edu.cn/info/1049/2950.htm

[99] Li, K. (2010). The Ming Maritime Trade Policy in Transition, 1368 to 1567 (Vol. 8). Otto Harrassowitz Verlag.

[100] Li, K. Z. (李开周) (2010). 宋朝纸币防伪标识. 半月选读, (17), 1.

[101] Li, M., Wang, N. Y., Lang, J. F., & Yi, W. (2022). Water Management at the Liangzhu Prehistoric Mound Center, China. Irrigation in Early States: New Directions. Stephanie Rost, 354.

[102] Li, S. (李爽) (2014). 《宋刑统》中的财产继承制度特点及影响略考. 兰台世界: 中旬, (11), 146-147.

[103] Li, Y. M. (李一鸣) (2018). 试论汉代的民间借贷习俗与官方秩序——兼论汉代民间借贷中的"契约精神". 民俗研究, (1), 9.

[104] Li, Y., & Yang, J. (1998). Tectonic Geomorphology in the Hexi Corridor, North-West China. Basin Research, 10(3), 345-352.

[105] Li, Z. (李喆) (2012). 《资本论》中的资本主义起源论新探. 教学与研究, 47(1), 32.

[106] Liang, S. W., Yuan, J. P., & Han, X. Y. (梁帅威, 袁俊平, & 韩翔宇) (2019). 良渚水利系统中草裹泥的强度变形试验研究. 河北工程大学学报: 自然科学版, 36(3), 6.

[107] Liang, W. B. (梁万斌) (2013). 从长安到洛阳: 汉代的关中本位政治地理. 博士学位论文, 复旦大学.

[108] Lin, J. L., & Hsiao, K. H. (2025). Comparison of Armillary Sphere in Ancient China and Western World. Engineering Proceedings, 89(1), 15.

[109] Liu, B. (2020). Liangzhu Culture and the Ancient City of Liangzhu. The Oxford Handbook of Early China, 131.

[110] Liu, B. (2022). Liangzhu Jade Artifacts. Springer, Zhejiang University Press. https://doi.org/10.1007/978-981-19-0292-5

[111] Liu, H. Z. (刘花章) (2007). 两汉手工业商业的官营和民营. 博士学位论文, 河南大学.

[112] Liu, S. H. (2008). Neo-Confucianism (I): From Cheng Yi to Zhu Xi. In The Routledge History of Chinese Philosophy (pp. 377-407). Routledge.

[113] Liu, S. W. (柳思维) (2009). 浅论商朝时期的商业思想. 湖南商学院学报(长沙), 2009(1), 11-15.

[114] Liu, X., & Lv, Y. J. (刘欣, & 吕亚军) (2012). 宋辽贸易战论析. 北方论丛, (3), 72-77.

[115] Liu, Z., & Chen, Y. (2021). Cultural Study on Traditional Chinese Papermaking: Problem Awareness and Research Review. Revista Brasileira de Pesquisas Jurídicas, Avaré, 2(2), 182-208.

[116] Lobingier, C. S. (1918). Napoleon and His Code. Harvard Law Review, 32, 114.

[117] Loewe, M. (1994). Wang Mang and His Forbears: The Making of the Myth. T'oung Pao, 80(Fasc. 4/5), 197-222.

[118] Long, D., & Chi, X. (2024). The Transformation of Farmland Rights Transactions from the Song Dynasty to the Qing Dynasty: A Study Centering on the Nature and Rights of Dian Farmland. In The Institutions of Land Property Rights in China: Transformation and Development, 1560-1950 (pp. 99-143). Singapore: Springer Nature Singapore.

[119] Luo, G. Z. (2018). The Romance of the Three Kingdoms. Penguin UK.

[120] Makridakis, S. (2017). The Forthcoming Artificial Intelligence (AI) Revolution: Its Impact on Society and Firms. Futures, 90, 46-60.

[121] Mao, K. (茅坤(明)) (2010). 唐宋八大家文钞. 黄山书社.

[122] Mao, Y. K., & Wei, Z. J. (牟永抗, & 魏正瑾) (1978). 马家浜文化和良渚文化——

太湖流域原始文化的分期问题. 文物, (4), 7.

[123] Matés-Barco, J. M. (2023). The Great Depression of 1929: Crisis in the World Economy. In The Age of Global Economic Crises (pp. 1-37). Routledge.

[124] Mavroidis, P. C. (2005). The General Agreement on Tariffs and Trade: A Commentary. Oxford University Press.

[125] Mayer, A. J. (2013). The Furies: Violence and Terror in the French and Russian Revolutions. Princeton University Press.

[126] Michaud, P. (1958). The Yellow Turbans. Monumenta Serica, 17(1), 47-127.

[127] Nakamoto, S. (2008). Bitcoin Whitepaper. https://bitcoin.Org/bitcoin.Pdf

[128] Palo, M. (2013). The Jade Road. http://lup.lub.lu.se/student-papers/record/3864130

[129] Pearson, R. (2025). Lower Yangzi Archaeology. 34.

[130] Piao, B. P. (朴炳培) (2022). 敵對的朝貢體系: 遼金與高麗關係. Taiwanese Journal of Political Science, (92).

[131] Pipes, R. (2018). The Establishment of the Union of Soviet Socialist Republics. In The Soviet Nationality Reader (pp. 35-86). Routledge.

[132] Pollard, A. M., & Liu, R. (2021). Chemical Studies of Chinese Coinage II: From Qin to Yuan (221 BCE-1368 CE). Heritage Science, 9(1).

[133] Post, C. (2010). Exploring Working-Class Consciousness: A Critique of the Theory of the 'Labour-Aristocracy'. Historical Materialism, 18(4), 3-38.

[134] Powell, J. (2019). Supernovae. In From Cave Art to Hubble (pp. 39-79). Springer, Cham.

[135] Qin, L. (秦岭) (2024) 稻米之路，文明之光(博物视界). 人民日报. https://www.peopleweekly.cn/html/2024/wenshi_0708/215772.html

[136] Reid, A. (1987). Class and Organization. The Historical Journal, 30(1), 225-238.

[137] Reinhart, C. M., & Rogoff, K. S. (2008). Is the 2007 US Sub-Prime Financial Crisis So Different? An International Historical Comparison. American Economic Review, 98(2), 339-344.

[138] Renfrew, C., & Liu, B. (2018). The Emergence of Complex Society in China: The Case of Liangzhu. Antiquity, 92(364), 975-990.

[139] Schwarz-Schilling, C. (2010). The Treaty of Shanyuan—Then and Now: Reflections 1000 Years Later. Crossroads, 1, 2.

[140] Shelach, G. (1996). The Qiang and the Question of Human Sacrifice in the Late Shang Period. Asian Perspectives, 1-26.

[141] Sima, G. (司马光) (2011). 资治通鉴·卷十六 汉纪八. 中华书局.

[142] Sin, W. (2017). The Water Margin, Moral Criticism, and Cultural Confrontation. Dao, 16(1), 95-111.

[143] Solomon, R. (1999). The Birth of the Euro and Its Effects. The Brown Journal of World Affairs, 6(2), 141-148.

[144] Song, L., & Liu, H. (2012). Steel Industry Development and Transformation in China: An Overview. The Chinese Steel Industry's Transformation, 1-16.

[145] Song, Y. Z. (宋英泽) (2009). 武庚复国失败后的殷商遗民. 古都朝哥研究. http://www.qxzc.net/NH/gdzgyj/html/2009/11/106.htm

[146] Song, Z. M. (宋治民) (1992). 汉代手工业. 巴蜀书社.

[147] Sperber, J. (2005). The European Revolutions, 1848-1851 (Vol. 29). Cambridge University Press.

[148] Sturgeon, D. (2019). Pre-Qin and Han -> Histories -> Shiji -> Annals -> Annals of the Xia. Chinese Text Project: A Dynamic Digital Library of Premodern Chinese, Digital Scholarship in the Humanities. http://ctext.org

[149] Sturgeon, D. (2019,1). Pre-Qin and Han -> Histories -> Shiji -> Annals -> Annals of the Yin. Chinese Text Project: A Dynamic Digital Library of Premodern Chinese, Digital Scholarship in the Humanities. http://ctext.org

[150] Sturgeon, D. (2019,3). Pre-Qin and Han -> Histories -> Hou Han Shu -> 列传 -> 西羌传. Chinese Text Project: A Dynamic Digital Library of Premodern Chinese, Digital Scholarship in the Humanities. http://ctext.org

[151] Sturgeon, D. (2019,2). Pre-Qin and Han -> Histories -> Shiji -> 列傳 -> 貨殖列

傳. Chinese Text Project: A Dynamic Digital Library of Premodern Chinese, Digital Scholarship in the Humanities. http://ctext.org

[152] Sturgeon, D. (2019,4). Han -> Ancient Classics -> Book of Poetry -> Minor Odes of the Kingdom -> Decade of Bei Shan. Chinese Text Project: A Dynamic Digital Library of Premodern Chinese, Digital Scholarship in the Humanities. http://ctext.org

[153] Sudetic, C. (2011). The Philanthropy of George Soros: Building Open Societies. Publicaffairs.

[154] Sun, G. P. (2013). Recent Research on the Hemudu Culture and the Tianluoshan Site. A Companion to Chinese Archaeology. 555-573.

[155] Suny, R. G. (1983). Toward A Social History of the October Revolution. The American Historical Review, 88(1), 31-52.

[156] Taketa, K. (2004). A Large Speculator in Contagious Currency Crises: A Single "George Soros" Makes Countries More Vulnerable to Crises, but Mitigates Contagion. Institute for Monetary and Economic Studies, Bank of Japan.

[157] Tan, J. G. (唐际根) (2016). "妇好"之问. 《人民日报》2016 年 5 月 15 日第 12 版副刊. http://kaogu.cssn.cn/zwb/kgyd/kgsb/201605/t20160516_3937333.shtml

[158] Tan, J. G. (唐际根) (2021). 关于殷墟人骨 DNA 和殷墟人种问题我想说几句. 中国社会科学网. http://kaogu.cssn.cn/zwb/kgyd/kgsb/202006/t20200623_5146617.shtml

[159] Tao, M., & Wei, L. (2019). The Monetary and Fiscal System of the Western and Eastern Han Dynasties. In The Political Economy of the Han Dynasty and Its Legacy (pp. 67-85). Routledge.

[160] The Xia. Chinese Text Project: A Dynamic Digital Library of Premodern Chinese, Digital Scholarship in the Humanities. 2025. http://ctext.org

[161] Vigo, G. (1974). Real Wages of the Working Class in Italy: Building Workers' Wages (14th to 18th Century). Journal of European Economic History, 3(2), 378.

[162] Wang, B. Q., & Liu, W. B. (王炳庆, & 刘文波) (2007). 宋代海外贸易政策的转变与福建海商的崛起. 江西科技师范学院学报, (6), 10-13.

[163] Wang, H. (王昊) (2020). 宋代的蚕桑纺织与农家生计. 中国经济史研究, (2),

84-100.

[164] Wang, H. L. (王红蕾) (1996). 析中国古代土地制度之演变. 发展, (8), 2.

[165] Wang, J. F. (王进锋) (2020). 商代官员的仕宦——由戍嗣鼎新释引发的探讨. 史学月刊, (12), 10.

[166] Wang, J. Y., Yin, C. Z., & Liu, X. J. (王金玉, 阴春枝, & 刘学健) (1995). 从档案资料看包拯在宋代的威名. 档案管理, (3), 43-45.

[167] Wang, L., & Sebillaud, P. (2019). The Emergence of Early Pottery in East Asia: New Discoveries and Perspectives. Journal of World Prehistory, 32(1), 73-110.

[168] Wang, M. (2018). Resource and Social Identity: Jade Usage in the Neolithic Liangzhu Culture, China, and the Modern Display and Uses of Liangzhu Jade Artifacts. Master's Thesis, Graduate School of Arts and Sciences, Universidad De Boston, 48-58.

[169] Wang, M. Y. (王梦雨) (2024). 以画为媒: 宋, 辽民族间的交流与互鉴. 重庆大学学报(社会科学版), 30(4), 188-197.

[170] Wang, N. Y., & Liu, B. (王宁远, & 刘斌) (2015). 杭州市良渚古城外围水利系统的考古调查. 考古, (1), 3-13.

[171] Wang, R., Wang, C. S., & Tang, J. G. (2018). A Jade Parrot from the Tomb of Fu Hao at Yinxu and Liao Sacrifices of the Shang Dynasty. Antiquity, 92(362), 368-382.

[172] Wang, X. H. (王贤辉) (2010). 宋朝福建官商蒲寿庚. 产权导刊, (8), 1.

[173] Wang, Y. C. (王永长) (2019). 中国古代土地所有制"二元结构"变迁. 高等财经教育研究, 22(1), 78-85.

[174] Wayman, M., & Wang, H. W. H. (2003). Cast Iron Coins of Song Dynasty China: A Metallurgical Study. Historical Metallurgy, 37(1), 6-24.

[175] Webster, F. (2014). Theories of the Information Society. Routledge.

[176] Westwood, J. N. (1986). Russia against Japan, 1904-1905: A New Look at the Russo-Japanese War. SUNY Press.

[177] Whitfield, R., Whitfield, S., & Agnew, N. (2015). Cave Temples of Mogao at

Dunhuang: Art History on the Silk Road. Getty Publications.

[178] Wordie, J. R. (1983). The Chronology of English Enclosure, 1500-1914. Economic History Review, 483-505.

[179] Wu, C. (2021). Searching for the Prehistoric Seafaring Craft Between Southeast Coast of China and the Pacific Islands. In The Prehistoric Maritime Frontier of Southeast China: Indigenous Bai Yue and Their Oceanic Dispersal (pp. 161-185). Singapore: Springer Singapore.

[180] Wu, L., Zhu, C., Ma, C., Li, F., Meng, H., Liu, H., et al. (2017). Mid-Holocene Palaeoflood Events Recorded at the Zhongqiao Neolithic Cultural Site in the Jianghan Plain, Middle Yangtze River Valley, China. Quaternary Science Reviews, 173, 145-160.

[181] Wu, X. H. (吴兴汉) (1993). 中国货币文化宝库中的一颗明珠——东至县发现的南宋"金银见钱关子钞版"论述. 钱币文论特辑.

[182] Wu, X., Zhang, C., Goldberg, P., Cohen, D., Pan, Y., Arpin, T., & Bar-Yosef, O. (2012). Early Pottery at 20,000 Years Ago in Xianrendong Cave, China. Science, 336(6089), 1696-1700.

[183] Dong, X. R. (2022). A Brief History of the Silk Road. In The Routledge Handbook of the Belt and Road (pp. 65-70). Routledge.

[184] Jiang, X. D. (2023). The Productivity Level of the Song Dynasty. Social Sciences in China, 44(2), 74-93.

[185] Xie, Y. L. (谢元鲁) (1994). 宋代四川造纸印刷技术的发展与交子的产生. 四川金融.

[186] Huan, X. J., Li, Q., Ma, Z. K., Jiang, L. P., & Yang, X. Y. (2014). Fan-Shaped Phytoliths Reveal the Process of Rice Domestication at Shangshan Site, Zhejiang Province. Quaternary Sciences, 34(1), 106-113.

[187] Xu, J. S. Hu, S. K., & Xie, S. H. (徐劲松, 胡莎可, & 谢四海) (2004). 试论黄石西塞山宋代钱窖的性质. 江汉考古, (4), 6.

[188] Xu, S., Cheng, L., Liu, Y., & Lian, Y. (2023). The Origin of Su Embroidery. Asian Social Science, 19(6), 1-20.

[189] Yang, H. Q., & Cui, Y. (杨卉青, & 崔勇) (2011). 宋代土地契约法律制度. 保定

学院学报, 24(5), 6.

[190] Yang, J. (2019). The Underground Luxury of a Western Han Marquis: Major Discoveries from the Tomb of the Marquis of Haihun in Nanchang. Asian Archaeology, 2(2), 65-102.

[191] Yang, J. K. (杨纪珂) (1975). 世界上最早的太阳视运行轨道椭圆学说——读沈括《梦溪笔淡》第 128 条. 中国科学技术大学学报, (1), 28-33.

[192] Yang, X. Z., & Gao, W. (杨锡璋, 高炜, 主编) (2003). 第六节 殷墟人骨的种系及相关问题. 中国考古学·夏商卷. 中国社会科学出版社.

[193] Yardımcı, A. B. (2019). An Inquiry on the Existence of Capitalism in Ancient Greece.

[194] Yavetz, Z. (1988). Slaves and Slavery in Ancient Rome. Transaction Publishers.

[195] Ye, Z. B. (叶正渤) (2001). 我方鼎铭文今释. 故宫博物院院刊, (3), 4.

[196] Ying, X., Phatlakfa, C., & Soontorntanaphol, N. (2024). Analyzing the Social Organization of the Western Han Dynasty through the Artworks of the Marquis Haihun Tom. Journal of Multidisciplinary in Humanities and Social Sciences, 7(6), 3243-3258.

[197] You, B., & Ni, Y. P. (游彪, & 倪玉平) (1998). 《宋代法制研究》评介. 中国史研究动态, (8), 28-30.

[198] Yu, T. Z. (余天炽) (1984). 战国秦汉的重农抑商政策及其历史检讨. 华南师范大学学报: 社会科学版.

[199] Yuan, J., & Flad, R. (2005). New Zooarchaeological Evidence for Changes in Shang Dynasty Animal Sacrifice. Journal of Anthropological Archaeology, 24(3), 252-270.

[200] Yuan, J., Pan, Y., Dong, N., & Storozum, M. (2022). The Rise and Fall of the Liangzhu Society in the Perspective of Subsistence Economy. Chinese Archaeology, 22(1), 145-152.

[201] Zhai, K., Sun, G., Zheng, Y., Wu, M., Zhang, B., Zhu, L., & Hu, Q. (2022). The Earliest Lacquerwares of China Were Discovered at Jingtoushan Site in the Yangtze River Delta. Archaeometry, 64(1), 218-226. https://doi.org/10.1111/arcm.12698

[202] Zhang, B. S. (张本顺) (2021). 宋代商业法制近世化及其意义. 社会科学辑刊, (3), 138-146.

[203] Zhang, F. (2017). The Naming of Bronze Bells in the Shang Dynasty; the Concept System of Yuexuan; Bronze Bells' Definition: Three Issues about the Bronze Bell. Theoretical Studies in Literature and Art, 37(3), 164-171.

[204] Zhang, H., Cheng, H., Sinha, A., Spötl, C., Cai, Y., Liu, B., et al. (2021). Collapse of the Liangzhu and Other Neolithic Cultures in the Lower Yangtze Region in Response to Climate Change. Science Advances, 7(48), eabi9275.

[205] Zhang, T., Wang, N. Y., Zhang, Y. X., & Fan, C. (张涛, 王宁远, 张依欣, & 范畴) (2023). 三维重建技术在考古中的应用——以杭州小古城遗址为例. 东方收藏, (9), 103-105.

[206] Zhang, W., Zheng, T., Wang, Z., & Meadows, M. E. (2022). Reconstruction of Coastal Flooding Processes and Human Response at the End of the Liangzhu Culture, East China. Quaternary Science Reviews, 293, 107705.

[207] Zhang, X. W. (张祥稳) (1996). "赤眉"缘由新探. 池州学院学报, (2), 59-62.

[208] Zhang, Y. (张燕) (2006). 试论宋代货币与钱币文化. 硕士学位论文, 中央民族大学. 5.

[209] Zhang, Y. (2015). Animal Procurement in the Late Neolithic of the Yangtze River Basin: Integrating the Fish Remains into a Case-Study from Tianluoshan. Master's Thesis, University College London, 32.

[210] Zhang, Z. P. (张忠培) (2012). 良渚文化墓地与其表述的文明社会. 考古学报, (4), 22.

[211] Zheng, H. J., Wu, R. K., & Chen, E. F. (郑焕坚, 吴润凯, & 陈恩发) (2022). 历史的暗线. 东方出版社, 29-36.

[212] Zheng, X. F. (郑学富) (2023). "儒林巨匠"的母亲们. 齐鲁晚报.

[213] Sun, Z. X. (1993). The Liangzhu Culture: Its Discovery and Its Jades. Early China, 18, 1-40.

[214] Zhou, J., Hao, Y., Jin, F., & Zhou, J. (2017). Shanxi Merchants' Multilevel Financial System in Ming and Qing Dynasties, China. Emerging Markets Finance and Trade, 53(2), 376-386.

[215] Zhu, J., Huang, Q., Zou, G., Zhu, C., & Guo, J. (2023). The Critical Node of the Transmission of Iron and Steel Technology on the Silk Road in the Han Dynasty: Study on the Iron Artifacts from the Han Dynasty Tombs in Xingfucheng, Guyuan, Ningxia Hui Autonomous Region, Northwest China, CA. 202 BC-141 BC.

[216] Zhu, N. C. (2023). The Incomparable Ivory Cups: The Story of the Legendary Fu Hao. Chinese Academy of History. All about Chinese Culture: An Illustrated Story of China in 10 Cultural Relics. Springer Nature, 61-86.

[217] Zhu, X. M. (诸侠鸣) (2024). 传统中国乡村治理的演变. 国学(汉斯), 12(1), 12-20.

[218] Zhu, Y. (朱彧) (1941). 萍洲可谈. 中华书局.

[219] Zhu, Y. (2022). Eighty Years of Archaeology at Liangzhu. Springer.

[220] Zoeller, C. J., & Bandelj, N. (2019). Crisis as Opportunity: Nixon's Announcement to Close the Gold Window. Socius, 5, 2378023119841812.

Chapter 5. Global Change and Capitalism

Global change (AGCI, 2025) refers to significant, planet scale transformations occurring at the global level, so vast that they can even be observed from outer space. Specifically, it encompasses the evolution of the Earth's material system, changes in human social systems, the rise and fall of plant and animal systems, and the intricate interactions between these three. Take the extinction of dinosaurs as an example (Brusatte, Butler, Williamson, et al., 2015); the sudden and short lived disappearance of this biological system on Earth is a major change in the Earth's ecosystem observable from a cosmic perspective, and it can be regarded as a typical case of global change. However, for a local earthquake (Mimura, Yasuhara & Kazama, 2011), although it causes severe disasters and casualties, the frequency of earthquake activities on Earth does not change fundamentally compared to the vast universe. Therefore, such local changes in the Earth's material system, which are barely detectable from outer space, are not sufficient to be called global change. On the contrary, the end of the Last Glacial Maximum (Hughes, Gibbard & Ehlers, 2013), accompanied by the extensive melting of glaciers worldwide and the rapid rise in sea levels, is an extraordinary planetary level transformation of the Earth's material system and undoubtedly falls into the category of global change. Another example is the unprecedented flood during the period of the ancient Liangzhu Ancient City, which destroyed ancient human civilizations. The Liangzhu Ancient City and the Dawenkou Civilization in the north were both submerged (Zhang, Zheng, Meadows, et al., 2022). Although from a material perspective, this was long after the end of the Last Glacial Maximum, and the scale of the flood caused by the breach of glacial lakes left by the melting of ice sheets might not be as large as the sea level rise caused by the overall melting of global ice sheets, it dealt a devastating blow to the human civilization system. Moreover, the geological relics possibly left by this great flood, such as the Tarim Basin, the Hexi Corridor, and the submerged

Ryukyu Islands, can be directly observed from outer space. Hence, it can also be considered a global change.

The connotation of global change is broad and diverse, with its focus shifting over time. According to existing data, the global change during the dinosaur extinction was mainly caused by an asteroid impact; after the end of the Last Glacial Maximum, it was mainly the global impact brought about by the rise in sea levels. In modern times, especially since the 21st century, with the acceleration of industrialization and the rapid advancement of industrial technology, the emission of greenhouse gases such as carbon dioxide has increased sharply, far exceeding the emissions from human natural metabolism, leading to a continuous rise in global temperatures (Wadanambi, Wandana, Arachchige, et al., 2020). Therefore, the current stage of global change mainly focuses on global climate change. The continuous rise in temperature has triggered a series of catastrophic problems, such as the frequent occurrence of extreme weather (Kates, Colten, Leatherman, et al., 2006), rampant floods (Nanditha, Kushwaha, Mishra, et al., 2023), and the further rise in sea levels due to the melting of ice sheets (Mimura, 1999). These climate changes have not only triggered profound changes in human society but also led to the frequent occurrence of natural disasters, forcing humans to build various flood control and disaster prevention facilities. Faced with the further rise in global temperatures in the future, humans must formulate corresponding policies to curb greenhouse gas emissions. One of the most effective measures is to reduce greenhouse gas emissions (Ritchie, Rosado & Roser, 2023), which requires the joint efforts of all countries around the world to abandon traditional fossil energy and switch to new energy sources. This series of measures will undoubtedly profoundly change the existing operation mode and structure of human society.

Modern global change is not only reflected in the changes in the natural environment but also deeply related to the rapid development of new technologies, especially the innovations in the Internet and artificial intelligence, which have a far reaching impact on human society. From the unique perspective of social thermodynamics, we can see that the introduction of these information technologies has greatly strengthened the interaction and connection between people,

promoting the transformation of human society from a loose and scattered state to a more tight and cohesive one (Cheng, 2023). With the integration of these advanced technologies into the entire international community, social cohesion has been enhanced unprecedentedly, and this series of changes is leading human society into a brand new stage of development.

At the same time, the profound changes in human society and the renewal of concepts will inevitably lead to adjustments in the way humans interact with the natural ecosystem. Such changes in interaction further cause corresponding evolutions in the entire ecosystem. It is particularly noteworthy that a large amount of waste generated by human activities, such as plastic waste (Evode, Qamar, Iqbal, et al., 2021), is seriously polluting the environment, exerting great pressure on and causing damage to the ecosystem, and thereby profoundly affecting the natural environment on which human society depends for survival.

Currently, modern capitalism is in its prime. Therefore, global change has an extremely profound impact on modern capitalism, bringing unprecedented new challenges and problems. This requires us to conduct in depth theoretical and practical research to explore ways to solve problems and make accurate predictions about the future.

5.1. The Impact of Global Change on Currency

Global change has an extremely far reaching impact on the modern monetary system, mainly reflected in the fact that the development of emerging information technologies has enabled humans to innovate the types of currencies and their ways of use. Currently, electronic payment methods have been widely popularized in China and some other countries (Hwang & Wen, 2024). Although such payment methods are still based on the traditional monetary system, they have completely broken away from paper money in the consumer payment link and instead adopted electronic accounting models, such as WeChat Pay (Wang & Gu, 2017) and Alipay (Liu, 2015). This cashless payment method has greatly facilitated people's lives, thereby giving rise to the so called cashless society.

In fact, before the emergence of electronic payment methods such as Alipay and WeChat Pay, capitalist societies around the world, such as developed countries in Europe and America, had already begun to use cashless payment methods such as credit cards and checks. However, these payment methods are closely associated with banks, while the current payment models of WeChat and Alipay completely separate banks from the consumer payment process. That is, when paying for goods, the payment process is completed by independent companies, and banks only provide support such as funds.

At the beginning of the 21st century, a brand new form of currency cryptocurrency emerged (Nakamoto, 2022; Vranken, 2017). Cryptocurrency uses digital encryption technology to encrypt the content of documents through digital keys of sufficient length, making it impossible for those without the corresponding private keys to decrypt. Although in theory, all digital encryption can be cracked, considering the current and foreseeable future computer processing speeds, if the key length is set appropriately, it would take millions of years to crack using existing or foreseeable future computer technologies. Within the limited lifespan of humans and the process of social development, this can be regarded as unbreakable. By using this digital encryption method and taking sufficiently long numbers as keys, it can be ensured that the documents or accounting information owned by each person cannot be cracked, thus making the account book a personal private property. When this account book is used as a widely accepted form of currency, cryptocurrency is invented.

The emergence of cryptocurrency marks a fundamental reform of the monetary system. Since the cryptocurrency owned by consumers cannot be cracked by any institution, it is completely owned by individuals and does not require management by any regulatory authority, such as Bitcoin. In addition, the total amount of cryptocurrencies like Bitcoin is limited, so there is no problem of inflation caused by excessive currency issuance. Therefore, as a new type of currency that adapts to the technological development of the Internet era, cryptocurrency does not need to be managed by institutions such as central banks and can be used normally directly on the Internet or corresponding platforms. At the same time, its limited total amount also ensures that inflation will not be

triggered by excessive currency issuance.

Of course, as a digital currency, cryptocurrency cannot circulate completely freely and also requires maintenance. Traditional paper money is managed by the central bank, which reclaims old banknotes and issues new ones. The maintenance of digital currency mainly relies on "miners" to mine cryptocurrencies such as Bitcoin regularly and in a fixed quantity every year (Vidan & Lehdonvirta, 2019) to meet the needs of its continuous circulation on the Internet. Considering the limited nature of cryptocurrency, the amount of cryptocurrency that can be mined is halved every year, which ensures that miners can continue to mine and effectively maintain the entire cryptocurrency chain.

From the above analysis, it can be seen that the global changes triggered by the development of modern information technologies are extremely profound. From the early use of stone tools and jade as currency (lasting for about 10,000 years), to the use of rare items such as seashells as currency (lasting for one or two thousand years), then to the use of bronze as currency in the Bronze Age (lasting for nearly 3,000 years in China from the Zhou Dynasty to the Qing Dynasty), and the use of precious metals such as gold and silver as currency starting from ancient Rome and ancient Greece (lasting for two or three thousand years), and then to the use and issuance of paper money (lasting for more than 1,000 years), the innovation and development of currency all require long term accumulation and gradual adaptation by users. However, the emergence of electronic payment and cryptocurrency in modern society has only taken a few decades, which shows the rapid pace of global changes triggered by modern technological revolutions. This requires modern capitalist societies to quickly adapt to the changes of this era, both in theory and in practice.

5.2. The Impact of Global Change on the Proletariat

Against the backdrop of global change, the role and status of the proletariat have undergone profound and significant transformations. Confronted with the severe challenges of climate change, the proletariat in underdeveloped and impoverished countries is the first to be affected. These workers have long toiled in harsh environments, and now, as global temperatures continue to rise, their

working conditions have become even more adverse. Many workers are forced to work in extreme conditions where the ambient temperature exceeds 40°C (Dash & Kjellstrom, 2011), which not only severely impairs their physical health but also poses a threat to their lives. Additionally, climate change has disrupted industrial chains in some regions and forced industries to relocate. For instance, in low lying areas such as certain Pacific island nations, even a slight rise in sea levels has submerged large tracts of land (Farbotko & Lazrus, 2012), compelling the local proletariat to face the dilemma of migration. However, the trends of trade protectionism (Fouda, 2012) and anti immigration sentiment have further exacerbated their survival crisis.

In contrast, in regions that were originally relatively cold, global warming has brought about the upgrading of industrial chains and an increase in crop yields, creating new employment opportunities for the local proletariat. It is evident that climate change directly intensifies the imbalance in development between regions, resulting in significant disparities in the living conditions of the proletariat across different areas.

Meanwhile, the frequent occurrence of extreme weather events triggered by the global temperature rise has forced many factories to shut down due to weather related reasons, reducing the employment opportunities available to the proletariat. On the other hand, emergency tasks related to disaster response have placed them in even more dangerous working environments, further deteriorating their working and living conditions. In areas with high geological risks, such as island nations like Japan, seawater erosion may trigger more frequent and stronger earthquakes (Mimura, 2013), seriously threatening the survival and safety of the local proletariat.

From the perspective of the information technology revolution, the development of information technology has created more new jobs in society, but these positions have higher requirements for workers' skills. This has forced the proletariat to update their knowledge systems; in addition to their daily work, they also need to invest additional costs in learning. Some high quality enterprises provide free training, while for the proletariat facing the risk of unemployment in enterprises with relatively poor performance, they have to bear the costs

themselves, which undoubtedly increases their work related expenses.

Driven by in depth research on proletarian theory, some developed countries have begun to pay attention to the living conditions of the proletariat and have introduced a range of welfare measures, such as training opportunities and paid leave. These measures allow the proletariat to have more leisure time to update their knowledge. At the same time, through the influence of trade unions and incentive measures like equity incentives, the working class can share in the fruits of enterprise development during their work. However, these welfare and incentive measures are often limited to developed capitalist countries. In southern countries and developing countries, which account for the majority of the world's population, the situation of the working class has become increasingly difficult due to the development of information technology and changes in the employment environment (Agarwala, 2006). They lack the paid holidays and sufficient training opportunities available in developed countries, which essentially means that developed countries have transferred class contradictions to developing countries. For example, in the production chains of companies such as Apple and Nike, the links with the highest profits remain in developed countries, while the low profit, labor intensive assembly work is relocated to developing countries (Jean, 2022). This has created more proletarians in developing countries, and these workers often work in extremely difficult environments.

Furthermore, global climate change has given rise to many unknown new viruses (Singhal, 2020), posing significant challenges to the healthcare system. Some members of the proletariat have suffered physical and mental health damage as a result, which has affected the quality of the labor force and, in turn, reduced their labor remuneration.

In the era of the rapid development of the Internet, although the proletariat possesses a small amount of property to maintain their own reproduction, they still need to address issues such as elderly care and illness. However, the popularization of the Internet has also made it difficult to protect personal privacy (Mesch & Dodel, 2018). A great deal of personal information is easily accessible to criminals, which may lead to the theft of the elderly care funds that the proletariat have saved for themselves, further worsening their living conditions.

The development of artificial intelligence technology has had an even greater impact on the employment market of the proletariat. Many jobs that originally required a certain level of expertise, such as translation (Kirov & Malamin, 2022), can now be replaced by artificial intelligence. A large number of employees who originally engaged in translation and similar work are now facing a severe risk of unemployment. In the future, the widespread application of robots will gradually replace manual labor positions such as material handling (Xinhua, 2025) and welding, further intensifying the unemployment risk for the proletariat. Of course, the emergence of artificial intelligence and Internet technologies has also created new employment opportunities, but this means that the proletariat facing unemployment will be forced to update their knowledge systems and bear additional training costs.

As for changes in the global ecosystem, they call for green development. Workers originally engaged in the production of industrial products with high pollution levels are also facing the crisis of unemployment and career transformation. Global ecological pollution has caused changes in the ecological environment, damaged biodiversity, and thereby affected the food acquisition and dietary structure of the global proletariat, which may directly threaten their health.

In summary, global change has had a profound and unprecedented impact on the living and working conditions of the proletariat. How to safeguard the rights and interests of the working class under the new conditions of global change has become an important issue that requires in depth research by interdisciplinary scholars and social scientists.

5.3. The Impact of Global Change on the Rule of the Bourgeoisie

Against the backdrop of the ever changing global environment, the accelerated flow of information has awakened many people who once suffered from colonial oppression, making them more actively pursue independence and sovereignty. This trend has forced former colonial powers to abandon their colonies (Picheta,

2025), effectively helping countries around the world, regardless of their economic development levels, to strive for opportunities for independent and equal development. However, with the decline of colonialism, capitalist countries have given rise to a new form of interventionism (Doyle, 2001). Instead of directly controlling poor countries through colonial means, they now achieve their goals by interfering in the internal affairs of other countries, including ideological infiltration, the use of international and regional institutions (such as NATO), and military intervention (Schmitt, 2010). This interventionism has plunged many countries into turmoil (Aleya Sghaier, 2012) and hindered their development. For example, more than a decade after 2011, Tunisia's overall economic level has declined (Chebbi, 2021). Against the backdrop of unbalanced economic development, capitalist countries also interfere in specific countries through multinational alliances, forcing them to give up their economic development interests. In the 1980s, for instance, Europe and the United States forced the Japanese yen to appreciate significantly through the Plaza Accord (Frankel, 2015), thereby affecting Japan's competitiveness and economic development. In turbulent regions like Libya, the intervention of armed forces such as NATO directly led to regime changes.

On the other hand, with the growing awareness of environmental protection, developed countries in Europe and America have promoted a series of environmental policies and measures to address issues such as air pollution and plastic waste, such as restricting the use of plastics (Leal Filho, Saari, Voronova, et al., 2019) and implementing strict automobile emission standards (Crippa, Janssens Maenhout, Galmarini, et al., 2016). These policies have played a positive role in improving the environment. Nevertheless, in order to achieve environmental protection goals, developed countries have transferred some backward industrial chains to third world countries, indirectly exporting environmental pollution. This has caused severe environmental pollution problems in some third world countries. For example, in the 2020s, air pollution in regions such as India and Pakistan (Abdul Jabbar, Tul Qadar, Cherrez Ojeda, et al., 2022) posed a serious threat to the health of local people. Another severe challenge in the 21st century is global warming (Noor, Nazeer, Baqi, et al., 2021), which stems from

the massive burning of fossil fuels, the use of industrial machines, and automobiles and other heat engines since the Industrial Revolution. While these heat engines provide power for the development of human society and capitalism, they inevitably release a large amount of heat into the environment. In particular, carbon dioxide produced by the combustion of chemical fuels accumulates in the atmosphere, forming a greenhouse effect and causing a continuous rise in global temperatures. The rise in global temperatures will trigger various extreme climates and lead to the melting of polar ice sheets (Stroeve & Notz, 2018), which in turn will cause sea levels to rise. This poses a threat of submersion to low lying areas such as Pacific island nations, forcing entire countries to relocate. Therefore, the Paris Agreement on Climate Change was adopted in 2015 (DeConto, Pollard, Dutton, et al., 2021). This agreement was first signed among developed countries and imposes binding regulations on the relevant countries. Although this is a beneficial change made by the bourgeoisie for the future of the world, in the short term, it has also caused troubles for some underdeveloped countries on how to develop their economies while balancing development and environmental protection. More seriously, with the prevalence of trade protectionism, some developed countries have begun to break their commitments (Lin, 2025) and even spread lies about climate change (Dale, 2025) to meet the needs of the bourgeoisie for production and operation profits. This tendency deserves vigilance.

In the field of economic development, the Bretton Woods system was established after World War II to better govern the international community, including countries at different development levels both domestically and internationally. However, during the Nixon era, the peg between the U.S. dollar and gold was abolished, which essentially required the currencies of the world to be pegged to the U.S. dollar, forming the so called U.S. dollar hegemony (Norrlof, 2014). Using this U.S. dollar hegemony, developed capitalist countries can influence the development of the global economy through the appreciation and depreciation of the U.S. dollar. This is a change in the way the bourgeoisie rules under the new situation of global change. From past examples, this U.S. dollar hegemony has been quite effective in adjusting the world economy in a direction

that is beneficial to developed countries such as Europe and the United States.

To restrict the development of other underdeveloped and developing countries, developed countries in Europe and America have also adopted measures such as technology embargoes. Once signs of rapid rise are found in a developing country, they impose an embargo on key core technologies to prevent advanced technologies from flowing into developing countries (Stanislav, Natalia & Cui, 2021), thereby suppressing their economic development and enabling European and American countries to always maintain an overall leading position in economy, military, politics, and other aspects.

In addition to direct currency and technology restrictions, the bourgeoisie in developed countries such as Europe and America also manages the world through strong cultural and ideological output. They make full use of their solid knowledge and art system to export a large amount of culture, art, and ideology to other countries (Moran, 2004). This ideological output is somewhat concealed. Unlike direct military intervention, it can trigger internal changes in other countries, and the internal turmoil allows developed countries to completely avoid taking responsibility for interfering in other countries' affairs. For example, Hollywood movies in the United States are an important means of cultural, artistic, and ideological output (Maisuwong, 2012, June). Through movies, they promote the advantages of the U.S. political system, depict the United States as a paradise on earth, attract the yearning of many people in underdeveloped third world countries, and arouse their dissatisfaction with their own environments. Of course, under the influence of different U.S. ruling parties, Hollywood movies also continuously infiltrate the ruling concepts of the ruling party, such as the concept of diversity since Obama took office (Augoustinos & De Garis, 2012). Similar to the Song Dynasty's massive export of cultural, artistic, and ideological products to the Liao Dynasty in ancient times, the reason why European and American countries can effectively export culture, art, and ideology lies in their solid material foundation, that is, the rapid development of their economies. Therefore, only by improving their own economic strength can developing countries break free from the passive position in cultural and artistic forms.

In the long term development of modern capitalism, with the in depth study of social issues and the proposal of various theories, the bourgeoisie has continuously reflected on its own problems while strengthening its rule. Under the conditions of global change, the rapid development of Internet technology enables voices from all aspects to be promptly conveyed to the ruling class. Therefore, in the process of social development, the bourgeois rulers have also begun to consider the urgent needs of the proletariat, providing the proletariat with more welfare and the working class with more holidays in social management. This has alleviated class contradictions to a certain extent. However, this adjustment actually still transfers contradictions to developing countries by exporting inflation, crises, and other means. To fundamentally change these problems, it is still necessary to start with improving the level of technological development. For example, the extensive use of artificial intelligence can alleviate the contradiction in the demand for the reproduction of means of production, without having to transfer low level and high pollution work to developing countries.

In the entire process of economic development, the fundamental contradiction of capitalism, the contradiction between the socialized nature of production and the private ownership of the means of production has always existed. However, after recognizing the causes and consequences of these contradictions, capitalist societies have also begun to attach importance to the regulatory role of state power. For example, various financial tools are used to adjust the flow of funds in the economy. The central banks of the United States and other countries regularly review the economic development situation and use interest rate adjustments to guide funds to flow into the correct fields, thereby avoiding problems such as economic crises, inflation, and issues related to employment levels (Benjamin, 2000). Combined with the development of an efficient capital market, the role of these financial regulatory tools has become increasingly prominent. Even if a country experiences a severe economic and financial crisis, the use of these regulatory tools can largely alleviate the serious social problems caused by the crisis.

Of course, with the help of technologies such as the Internet and artificial intelligence, the bourgeois rulers can also adopt new technical methods to

encourage people at the bottom to work hard and improve their social status. These new jobs include operating self media accounts, making extensive use of social tools, and opening online stores (Rezabakhsh, Bornemann, Schrader, et al., 2006), allowing more people at the bottom to own their own businesses and reducing the chance of being exploited by capitalists for surplus value. Through the promotion of literary works and other means, the process of people at the bottom rising to higher social classes is publicized, inspiring ordinary people at the bottom to be content with their current situation and work harder.

Although through the above mentioned series of measures, under the conditions of global change, various class contradictions under the rule of the bourgeoisie in developed countries such as Europe and the United States seem to have been alleviated, and the fundamental contradictions of capitalism can also be properly regulated at the national level, a series of new problems have emerged, such as a severe labor shortage. After a large number of people at the bottom move up to new social classes, a large number of other laborers engaged in low level work are needed, which has led to many illegal immigration phenomena (Power, 1979). To solve this problem, the governments of developed countries have invested a large amount of resources and funds to prevent illegal immigrants from entering (Kolås & Oztig, 2022), but the effect has been unsatisfactory. Under such circumstances, some right wing political parties have adopted xenophobic approaches after taking office. Since the 2020s, this wave of anti immigration sentiment has been on the rise in developed countries in Europe and the United States (Lorenzetti, 2020), causing anxiety among many people.

Under the condition of globalization, some developing countries have also achieved rapid development. To protect their own economic interests, some countries have begun to adopt trade policies such as trade protectionism and unilateralism (Hakimi, 2014). This has seriously damaged the global free trade system established since the founding of the World Trade Organization, hindered normal trade exchanges, and had many adverse effects on some countries and even developed countries in Europe and the United States themselves. This actually reflects that even under the conditions of global change, although some problems have been solved, more new problems have emerged one after another.

How to solve these problems is believed to be more new challenges that the bourgeois rulers in modern capitalist societies need to face under the conditions of global change.

5.4. The Impact of Global Change on the Relations of Production

The form of ownership of the means of production changes with the change of ruling parties. During the era of Thatcher Reaganism, complete privatization and a free market economy were pursued (Sklair, 1997), while after the U.S. Democratic Party came to power, more national planning was introduced. Especially when enterprises are confronted with severe crises, the government will intervene in a timely manner. For example, there were cases where the government strongly stepped in the bankruptcy and reorganization of General Motors (Adler, 2010), Fannie Mae, and Freddie Mac (Frame, Fuster, Vickery, et al., 2015).

During his second term, Trump also exercised stricter control over the economic and educational fields by means of the government's strong intervention in enterprises and educational institutions (Duffy & Eadicicc, 2025).

In Europe, similar to the United States, the United Kingdom places greater emphasis on private ownership, but the national control policies differ when the Conservative Party and the Labour Party are in power. Countries on the European continent retain more elements of state control. After World War II, Germany and France nationalized key pillar industries such as automobiles and steel to recover their economies rapidly (Cohen, 2010), which made important contributions to the post war economic recovery of both countries. After the 1980s, the proportion of nationalization decreased to some extent, but the number of state owned enterprises in Germany and France is still far higher than that in Britain and the United States. Of course, the proportion of the state owned economy in the overall economy of the two countries is much lower than that in socialist countries such as the Soviet Union. In the context of globalization, the private economy is often unwilling to engage in industries that are highly public

welfare but have low returns due to the pursuit of profits. Therefore, a certain proportion of the state owned economy can adapt to global changes more effectively and adjust its business direction to meet social needs.

Under the current situation of global change, the two major classes of capitalists and the proletariat still exist, and the essence of capitalists exploiting surplus value remains unchanged. However, in modern capitalist society, especially with the development of the Internet and self media, many members of the working class can sell products through personal operation or self employment (such as opening online stores on self media platforms) (Ma, 2023). In this way, they do not need to work for capitalists and can obtain most of the economic benefits directly. The development of artificial intelligence technology further enables individuals to complete tasks that previously required a large number of human resources and other resources with the help of AI (Duffy, 2005), such as translation, writing, business planning, and report preparation. The widespread application of these tools has improved production efficiency, and robots have replaced workers in doing arduous and boring manual labor. Thus, the relationship between humans and machines has gradually begun to replace the traditional relationship between capitalists and the proletariat.

In addition, the development of the Internet has provided online communication channels. People who find it difficult to communicate effectively in real life for various reasons may become talkative "speakers" or social butterflies online. This has given rise to new types of interpersonal relationships and business cooperation models, which naturally have also changed the original relations of production (Österle, Fleisch & Alt, 2012).

It is precisely this new type of relations of production, spawned by the development of the Internet, that has strongly changed the way product benefits are distributed. In the past, workers worked for capitalists, and the surplus value was exploited. Nowadays, with the rapid development of the Internet and artificial intelligence technology, the number of self employed people is increasing, and personal online stores can also be highly competitive. Many individuals can directly obtain most of the benefits from production and operation. If artificial

intelligence or robots are used for work, the benefits generated, after deducting costs, belong entirely to individuals. This is quite different from the previous forms of income distribution.

5.5. Future Prospects

5.5.1. The Internal Contradictions of Capitalism as the Root of Its Decline

Since the inception of capitalism, despite cycles of rise and fall, it is not difficult to see that capitalism has displayed considerable vitality. From a historical perspective, the manner in which capitalism arose and collapsed varied greatly across different periods. Taking the ancient city of Liangzhu as an example, the rise of capitalism there was fueled by breakthroughs in industrial technologies such as pottery, textile, and shipbuilding, which promoted a highly developed system of commodity exchange. However, the capitalism in Liangzhu ancient city ultimately met its demise purely due to natural disasters. Although there were conflicts between Liangzhu ancient city society and the northern Dawenkou civilization at the time, the intensity of these conflicts was not sufficient to be considered the main reason for the collapse of its capitalism.

The rise of capitalism in the Shang Dynasty stemmed from the Xia Dynasty's neglect of the well-being of the people in disaster management, which allowed merchants with the trade capabilities reminiscent of the Liangzhu ancient city era to rise and establish the Shang Dynasty. The downfall of the Shang Dynasty, however, was due to merchant trading activities becoming detached from the actual needs of the lower-class peasantry, and missteps in the pursuit of arts and culture, which led to a pervasive atmosphere of fear in society. When the Zhou Dynasty replaced the Shang, it implemented a governance philosophy of emphasizing agriculture and curbing commerce to suppress capitalism. It was not until the Han Dynasty, after the harsh rule of Qin Shi Huang was overthrown, that states like Chu, which had previously benefited from trade, rose up against oppression and established the Han Dynasty. With the release of ideals of personal freedom and the pursuit of a better life, capitalism rapidly developed

during the Han Dynasty. Nevertheless, during its development, Han-era capitalism inevitably encountered class and fundamental contradictions, ultimately leading to its collapse due to the monopoly of large capitalists and landlords, resulting in the fragmentation of the state.

During the Song Dynasty, capitalism once again experienced rapid development. Unlike previous dynasties, the Song implemented foreign trade, resulting in a massive influx of wealth that allowed ordinary citizens to acquire substantial wealth, creating a relatively egalitarian society. However, this wealth equality came at the expense of neighboring countries and other ethnic groups, leading to severe conflicts with surrounding states and minorities. Under continuous pressure from the northern Liao, Jin, and Mongol empires, Song-era capitalism ultimately collapsed.

From the rise and fall of these representative capitalist societies, it can be seen that the emergence of capitalism mainly originated from rapid advancements in productive forces. When existing production relations could not adapt to these new productive forces, it propelled the swift rise and development of capitalist society. However, class and fundamental contradictions in capitalism inevitably concentrated and erupted after a period of prosperity, leading to the decline of capitalist society, demonstrating a pattern of "prosperity followed by decay."

Modern capitalism emerged in the 14th and 15th centuries and, after developing through the Industrial Revolution of the 18th century, has continued to grow to the present day. Similar to the Spring and Autumn and Warring States periods in China, the presence of fundamental contradictions in capitalism has caused different countries to experience cycles of rise and fall. Overall, however, capitalist society has endured for several centuries. Entering the 21st century, the advent of advanced information technology has largely alleviated many of the problems and contradictions that emerged during the Industrial Revolution, and currently, the continuous development of global capitalist society appears to face no major obstacles.

However, a closer observation of the capitalist systems in developed Western countries reveals that in fully free-market capitalist societies, such as the United

Kingdom and the United States, internal class contradictions and the fundamental contradictions of capitalism still exist and can sometimes be quite intense. Even so, countries like the UK and the U.S. have introduced numerous significant centralized regulatory measures, such as the Federal Reserve, central banks, and mechanisms for monetary control, as well as state bailouts for companies in crisis. Some capitalist countries on the European continent have even directly incorporated important elements of socialist systems, such as controlling a larger number of state-owned enterprises and employing state planning mechanisms. This indicates that the continued development of many capitalist countries today is due to a profound understanding of the class and fundamental contradictions of capitalism, the introduction of planned central regulatory measures, and the establishment of social welfare systems that allow ordinary workers and the proletariat to share the fruits of capitalist development. For example, in the United States, market capital flows are regulated through the Federal Reserve's control of interest rates, and the electronic trading systems of the securities market improve capital transaction efficiency. The operation of various pension funds, venture capital funds, public funds, and private equity funds enables ordinary people to accumulate wealth and invest in enterprises and industries with promising future prospects, thereby promoting global economic development while also meeting the wealth accumulation needs of the proletariat within developed countries.

However, while observing the development of capitalism in developed countries, we must not ignore the problem of uneven global economic development. Developed countries continue to accumulate wealth and grow increasingly rich, whereas impoverished countries have not fully shared in the rapid progress of the world economy. Some developing countries experience internal social turmoil and recurrent cycles of rise and decline, falling into the "middle-income trap" (Felipe, Abdon & Kumar, 2012). These countries often grow rapidly with initial aid from developed countries, but soon class contradictions and fundamental capitalist contradictions re-emerge, leading to severe national decline. For even poorer countries in Africa, opportunities for development may be entirely lacking. This is reminiscent of the Song Dynasty, which, while addressing the internal distribution of wealth and allowing most citizens to accumulate

substantial riches, caused neighboring countries to fall into poverty as wealth continuously flowed into Song China, and the resulting imbalance in development among nations ultimately contributed to the collapse of Song Dynasty capitalism.

Therefore, at least up to the present, we have yet to observe any clear signs of improvement in capitalist societies' class and fundamental contradictions. The presence of these contradictions continually poses a latent hazard to the decline and eventual demise of capitalist societies. Addressing these issues is an important task for the modern international community in the context of global change, in order to achieve common development, shared prosperity, and the collective enjoyment of human civilization's progress.

To address these issues, the first step is to objectively recognize their existence. For developed countries, the impoverished countries of the Global South remain a persistent and objective reality. If the development problems of these countries are not solved, they will eventually backfire on developed nations, severely impacting and burdening their economic development. Unfortunately, given the current trends, some developed countries seem to be moving toward unilateralism and protectionism, resisting foreign immigration and suppressing the development of other countries, which is clearly counterproductive to resolving the North-South imbalance.

However, it is worth noting that during the approximately 80 years of peace in the past, the international governance system and governance structure have initially taken shape. The establishment of the United Nations, the creation of the International Monetary Fund, and the establishment of the World Trade Organization were all aimed at addressing North-South imbalances and narrowing the gap between developed and developing countries. In addition, with the development of the Internet, various information can be rapidly disseminated, allowing people around the world to better understand situations in other regions and recognize regional imbalances, so they can quickly respond to emerging issues. These initiatives help promote global peace and quickly address the misalignment between developed and developing countries.

At the same time, the development of the Internet and social media has provided ordinary people in different countries and regions with entrepreneurial opportunities. Especially for those with professional skills and technical expertise, they can use social media to share their unique skills and products globally. For instance, ordinary people in remote and underdeveloped countries like Nepal can showcase their local culture online, attracting attention from people worldwide while earning considerable income and improving their living conditions. The impact of the Internet on Nepali society has been so significant that when the government attempted to regulate it, it provoked protests from young people in Nepal (Pokharel, 2025). These are all positive effects brought about by the Internet, which can potentially help address trade imbalances, national disparities, and wealth gaps to some extent.

Meanwhile, the development of artificial intelligence technology provides new opportunities for people in economically underdeveloped and poorly educated areas. They can use AI technology to enhance their skills and complete work that was previously impossible due to a lack of professional skills, thereby offering more employment opportunities and directions for ordinary working-class people in these regions. This is also an effective means of addressing wealth inequality and developmental imbalances.

Finally, from a thermodynamic perspective, in the stage of relatively backward technological development, the energy from nature was primarily converted into the energy needed to maintain the operation of capitalist society through the labor of the working class. At the same time, due to the backwardness of heat engine technology, the energy efficiency of machines was extremely low, resulting in a large amount of energy being wasted in the natural environment and unable to be effectively used for promoting human social development. In this context, the labor power of the working class, as a special commodity, became the core driving force of the entire development of capitalist society.

However, with the rapid development of information technology, human society has gradually entered the information age. At the same time, the energy

efficiency of various industrial technologies has greatly improved, and green and clean energy has been widely applied. This series of changes allows the energy from nature to be input into human society in a more efficient and diversified way, enabling the entire human society to operate smoothly in a relatively stable state.

For example, Internet technology can replace the traditional mode of manually traveling to remote areas for communication and trade. Therefore, under the premise of inputting the same amount of energy, less labor is required to complete transactions that previously demanded significant human and material resources (Karis, Wildman & Mané, 2016). Moreover, advancements in artificial intelligence further reduce the demand for numerous workers, with the decreased demand for specialized personnel in the translation field being a typical example. If robotic technology continues to advance in the future, and embodied intelligence develops to a level capable of replacing humans, tasks such as factory handling, daily care, and product sales could all be undertaken by robots. At that point, the energy from nature would only need to be input into artificial neural networks and robotic systems to support the stable operation of the entire capitalist society, which would undoubtedly have a significant alleviating effect on labor-capital conflicts.

5.5.2. A Community with a Shared Future for Mankind

In the 21st century, China's economy has achieved rapid development. It has not only injected strong impetus into its own growth but also significantly driven the global economy forward, making important contributions to the stability and development of the global economy. Against this backdrop, President Xi Jinping has put forward the new global governance concept of "a community with a shared future for mankind" (Wang, 2025; Ssemanda, 2024; Huaxia, 2023; Chuvilov & Malevich, 2022). This concept provides a fresh approach to breaking the cycle of the rise, development, and decline of societies under the capitalist model. Currently, the building of a community with a shared future for mankind is gaining increasingly widespread recognition from countries around the world. Many countries have joined hands with China to jointly advance this initiative

(Global Times, 2025; Wang, 2024). Looking ahead, there is reason to believe that developed countries will also gradually embrace and practice this concept, jointly moving toward a new era of human civilization development.

Literally, "a community with a shared future for mankind" emphasizes that all of humanity constitutes an indivisible whole. This concept breaks the inherent mindset in certain historical perspectives that holds that the development of human civilization must proceed through conflicts (Huntington, 2020) and represents a significant innovation over the theory of the clash of civilizations. Since all humanity is a single entity, people from different regions, with different beliefs, and in different states of wealth are all indispensable components of the broader social system, and their relationships are interdependent and mutually essential. Therefore, we must never attempt to eliminate others for the sake of superficial comfort.

The notion that all humanity is an integrated whole implies that humans should respect each other's national conditions and development status, fostering a harmonious situation where "harmony exists in diversity" (Li, 2008). This kind of peace transcends differences in social systems, ideologies, and beliefs, representing true inclusiveness and coexistence. Practices such as imposing one's own social or political system on others, or demanding that others completely change their ideological perspectives to conform to one's own, run counter to the concept of a community with a shared future for mankind.

The concept of a community with a shared future for mankind also emphasizes that humans must properly handle their relationship with nature. The Earth serves as the cornerstone of human survival, providing the necessary external environment and energy sources, and acting as a physical protective layer for human society. Once the living environment is damaged, humanity will face the impact of various natural disasters and may even move toward extinction. From a cosmological perspective, human organisms are extremely vulnerable in the harsh cosmic environment. Any planet scale change or even a minor stellar eruption could bring catastrophic consequences to humanity. Therefore, protecting the Earth's environment and improving the quality of human life have become extremely urgent tasks. Particularly in the current era, human technology

has already been able to significantly influence environmental changes. The concept of a community with a shared future for mankind requires all humans to take active actions to collectively address global changes, including the evolution of the Earth's physical system and environmental changes caused by human activities—such as global warming triggered by greenhouse gas pollution.

The Paris Agreement on climate change is an initial step in building a community with a shared future for mankind, but it is clearly far from sufficient. Currently, greenhouse gas emissions from human activities have not been effectively curbed, and the cumulative environmental effects since the Industrial Revolution have gradually pushed the original ecosystem beyond its limits. Just as a spring can be compressed and stretched within its elastic range, but excessive force will cause permanent deformation, our living environment is also facing a critical point where changes may shift from elastic to inelastic. Therefore, the concept of a community with a shared future for mankind demands that we take action as soon as possible and at a faster pace to collectively address the severe challenges posed by climate change.

The concept of a community with a shared future for mankind proposed by President Xi Jinping can be elaborated into "an interdependent view of international rights, a concept of common interests, a vision of sustainable development, and a perspective on global governance" (Qu, 2013; Wang, 2024). The interdependent view of international rights requires all countries to exercise their rights appropriately, not shirk their responsibilities, and at the same time respect the rights of other countries, refraining from suppressing others for self interest. These rights include the right to participate in international governance and the right to pursue their own development. The concept of common interests embodies the idea that all human societies and civilizations share a common interest: every country should be able to achieve development in the process of advancing the community with a shared future for mankind, improve the well being of its people, and engage in friendly exchanges with other countries around the world. When addressing environmental changes caused by human activities, the governance concept of a community with a shared future for mankind enables all humans to benefit.

The vision of sustainable development emphasizes that the development of human societies and countries should be sustainable and should not improve living conditions at the expense of the environment. For capitalist societies, it is also necessary to face up to the problems caused by class contradictions and fundamental contradictions. The vision of sustainable development requires countries at different development levels, especially underdeveloped capitalist countries, to face and resolve issues such as class contradictions and the gap between the rich and the poor. The gap between the rich and the poor among countries needs to be managed and guided by effective international institutions to ensure that this gap gradually narrows rather than widens.

The perspective on global governance means that future global governance will no longer follow the previous model where countries governed separately and acted on their own. The perspective on global governance requires that while considering the development of different countries, attention should also be paid to the overall development of the world. Trade protectionism and unilateralism are extremely harmful to global governance. We should actively practice multilateralism and open development, making full use of platforms such as the World Trade Organization to coordinate issues related to global trade imbalances. After the implementation of these measures, the building of a community with a shared future for mankind will continue to move toward new stages of development, and it will also provide new ideas and methods for solving the problem of the cycle of rise and decline in the development of human civilization.

References

[1] Abdul Jabbar, S., Tul Qadar, L., Ghafoor, S., Rasheed, L., Sarfraz, Z., Sarfraz, A., et al. (2022). Air Quality, Pollution and Sustainability Trends in South Asia: A Population-Based Study. International Journal of Environmental Research and Public Health, 19(12), 7534.

[2] Adler, B. E. (2010). A Reassessment of Bankruptcy Reorganization after Chrysler and General Motors. American Bankruptcy Institute Law Review, 18, 305.

[3] Agarwala, R. (2006). From Work to Welfare: A New Class Movement in India. Critical Asian Studies, 38(4), 419-444.

[4] AGCI (2025). Aspen Global Change Institute. https://www.agci.org/what-is-global-change

[5] Aleya-Sghaier, A. (2012). The Tunisian Revolution: The Revolution of Dignity. The Journal of the Middle East and Africa, 3(1), 18-45.

[6] Augoustinos, M., & De Garis, S. (2012). 'Too Black or Not Black Enough': Social Identity Complexity in the Political Rhetoric of Barack Obama. European Journal of Social Psychology, 42(5), 564-577.

[7] Benjamin, M. F. (2000). The Role of Interest Rates in Federal Reserve Policymaking. NBER Working Paper 8047. https://doi.org/10.3386/w8047

[8] Brusatte, S. L., Butler, R. J., Barrett, P. M., Carrano, M. T., Evans, D. C., Lloyd, G. T., et al. (2015). The Extinction of the Dinosaurs. Biological Reviews, 90(2), 628-642.

[9] Chebbi, N. (2021). An Assessment of the Benefits and Results of the Arab Spring with Focus on Tunisia for the Period 2011-2020. Master's Thesis of International Studies, Graduate School of International Studie, Seoul National University.

[10] Cheng, Z. (2023). Social Thermodynamics: An Interdisciplinary View. Lausanne; New York: Peter Lang Publishing Inc.

[11] Chuvilov, I. A., & Malevich, J. I. (2022). Community with a Shared Future for Mankind, and How This Concept Is Related to the Belt and Road Initiative.

[12] Cohen, P. (2010). Lessons from the Nationalization Nation: State-Owned Enterprises

in France. Dissent, 57(1), 15-20.

[13] Crippa, M., Janssens-Maenhout, G., Guizzardi, D., & Galmarini, S. (2016). EU Effect: Exporting Emission Standards for Vehicles through the Global Market Economy. Journal of Environmental Management, 183, 959-971.

[14] Dale, D. (2025). Fact Check: Sea Levels Are Already Rising Faster per Year than Trump Claims They Might Rise over 'Next 497 Years'. CNN. https://edition.cnn.com/2024/06/28/politics/fact-check-donald-trump-sea-levels-climate-change

[15] Dash, S. K., & Kjellstrom, T. (2011). Workplace Heat Stress in the Context of Rising Temperature in India. Current Science, 496-503.

[16] Deconto, R. M., Pollard, D., Alley, R. B., Velicogna, I., Gasson, E., Gomez, N., et al. (2021). The Paris Climate Agreement and Future Sea-Level Rise from Antarctica. Nature, 593(7857), 83-89.

[17] Doyle, M. W. (2001). The New Interventionism. Metaphilosophy, 32(1-2), 212-235.

[18] Duffy, C., & Eadicicc, L. (2025). The US Takes a 10% Stake in Intel as Part of Trump's Big Tech Push. CNN. https://edition.cnn.com/2025/08/22/tech/trump-intel-10-percent-stake

[19] Duffy, C. (2005). Why This Leading AI CEO Is Warning the Tech Could Cause Mass Unemployment. CNN. https://edition.cnn.com/2025/05/29/tech/ai-anthropic-ceo-dario-amodei-unemployment

[20] Evode, N., Qamar, S. A., Bilal, M., Barceló, D., & Iqbal, H. M. (2021). Plastic Waste and Its Management Strategies for Environmental Sustainability. Case Studies in Chemical and Environmental Engineering, 4, 100142.

[21] Farbotko, C., & Lazrus, H. (2012). The First Climate Refugees? Contesting Global Narratives of Climate Change in Tuvalu. Global Environmental Change, 22(2), 382-390.

[22] Felipe, J., Abdon, A., & Kumar, U. (2012). Tracking the Middle-Income Trap: What Is It, Who Is in It, and Why? Levy Economics Institute, Working Paper, (715).

[23] Fouda, R. A. N. (2012). Protectionism & Free Trade: A Country's Glory or Doom? International Journal of Trade, Economics and Finance, 3(5), 351.

[24] Frame, W. S., Fuster, A., Tracy, J., & Vickery, J. (2015). The Rescue of Fannie Mae and Freddie Mac. Journal of Economic Perspectives, 29(2), 25-52.

[25] Frankel, J. (2015). The Plaza Accord, 30 Years Later (No. W21813). National Bureau of Economic Research.

[26] Global Times (2025). Building China-Vietnam Community with Shared Future Carries Great Global Significance: Global Times Editorial. Global Times. https://www.globaltimes.cn/page/202504/1332105.shtml#:~:text=Xi%20proposed%20six%20measures%20to%20deepen%20the%20building,multilateral%20cooperation%2C%20and%20achieving%20more%20benign%20maritime%20interactions

[27] Hakimi, M. (2014). Unfriendly Unilateralism. Harvard International Law Journal, 55, 105.

[28] Huaxia (2023). Explainer: How Is China's Vision of Building a Community with A Shared Future for Mankind Viewed? Xinhuanet. https://english.news.cn/20230309/358995182051460 18d36f94ac4f916fb/c.html

[29] Hughes, P. D., Gibbard, P. L., & Ehlers, J. (2013). Timing of Glaciation during the Last Glacial Cycle: Evaluating the Concept of a Global 'Last Glacial Maximum' (LGM). Earth-Science Reviews, 125, 171-198.

[30] Huntington, S. P. (2020). The Clash of Civilizations? In the New Social Theory Reader (pp. 305-313). Routledge.

[31] Hwang, J. T., & Wen, M. (2024). Electronic Payments and Money Demand in China. Economic Analysis and Policy, 82, 47-64.

[32] Jean, C. (2022). A Study of India's Role and Importance in Future Global Supply Chains. Supply Chain and Sustainability Research: SCSR, 55-70.

[33] Karis, D., Wildman, D., & Mané, A. (2016). Improving Remote Collaboration with Video Conferencing and Video Portals. Human-Computer Interaction, 31(1), 1-58.

[34] Kates, R. W., Colten, C. E., Laska, S., & Leatherman, S. P. (2006). Reconstruction

of New Orleans after Hurricane Katrina: A Research Perspective. Proceedings of the National Academy of Sciences, 103(40), 14653-14660.

[35] Kirov, V., & Malamin, B. (2022). Are Translators Afraid of Artificial Intelligence? Societies, 12(2), 70.

[36] Kolås, Å., & Oztig, L. L. (2022). From Towers to Walls: Trump's Border Wall as Entrepreneurial Performance. Environment and Planning C: Politics and Space, 40(1), 124-142.

[37] Leal Filho, W., Saari, U., Fedoruk, M., Iital, A., Moora, H., Klöga, M., & Voronova, V. (2019). An Overview of the Problems Posed by Plastic Products and the Role of Extended Producer Responsibility in Europe. Journal of Cleaner Production, 214, 550-558.

[38] Li, C. (2008). The Ideal of Harmony in Ancient Chinese and Greek Philosophy. Dao, 7(1), 81-98.

[39] Lin, J. W. (2025). The United States Withdraws from the Paris Climate Agreement Again: Influences and Challenges of Sustainable Development in Chinese Taiwan. Journal of Environmental Management, 394, 127365.

[40] Liu, R. (2015). The Role of Alipay in China. Nijmegen, Radboud University, Nijmegen, The Netherlands.

[41] Lorenzetti, M. I. (2020). Anti-Immigration Rhetoric in Italy and in the USA: A Comparative Perspective. De Europa Special Issues, 97-121.

[42] Ma, X. (2023). Internet Usage and the Income Gap between Self-Employed Individuals and Employees: Evidence from China. Review of Development Economics, 27(3), 1509-1536.

[43] Maisuwong, W. (2012). The Promotion of American Culture through Hollywood Movies to the World.

[44] Mesch, G. S., & Dodel, M. (2018). Low Self-Control, Information Disclosure, and the Risk of Online Fraud. American Behavioral Scientist, 62(10), 1356-1371.

[45] Mimura, N. (1999). Vulnerability of Island Countries in the South Pacific to Sea Level Rise and Climate Change. Climate Research, 12(2-3), 137-143.

[46] Mimura, N. (2013). Sea-Level Rise Caused by Climate Change and Its Implications

for Society. Proceedings of the Japan Academy, Series B, 89(7), 281-301.

[47] Mimura, N., Yasuhara, K., Kawagoe, S., Yokoki, H., & Kazama, S. (2011). Damage from the Great East Japan Earthquake and Tsunami—A Quick Report. Mitigation and Adaptation Strategies for Global Change, 16(7), 803-818.

[48] Moran, B. I. (2004). United States' Trade Policy and the Exportation of United States' Culture. Vand. J. Ent. L. & Prac., 7, 41.

[49] Nakamoto, S. (2022). Bitcoin Whitepaper. Bitcoin: A Peer-to-Peer Electronic Cash System. www.Bitcoin.org. https://www.zouantcha.com/blog/bitcoin-whitepaper

[50] Nanditha, J. S., Kushwaha, A. P., Singh, R., Malik, I., Solanki, H., Chuphal, D. S., et al. (2023). The Pakistan Flood of August 2022: Causes and Implications. Earth's Future, 11(3), e2022ef003230.

[51] Noor, T., Nazeer, I., Attique, Z., Shahzad, M., & Baqi, A. (2021). Global Temperature Variations Since Pre Industrial Era. International Journal for Innovative Research in Science & Technology, 3, 67-74.

[52] Norrlof, C. (2014). Dollar Hegemony: A Power Analysis. Review of International Political Economy, 21(5), 1042-1070.

[53] Österle, H., Fleisch, E., & Alt, R. (2012). Business Networking: Shaping Enterprise Relationships on the Internet. Springer Science & Business Media.

[54] Picheta, R. (2025). UK Plan to Transfer Chagos Islands Goes Ahead Despite Last-Minute Legal Injunction. CNN. https://edition.cnn.com/2025/05/22/uk/britain-chagos-islands-transfer-block-intl

[55] Pokharel, K. (2025). Nepal Lifts Social Media Ban That Sparked Deadly Gen Z Protests. CNN. https://edition.cnn.com/2025/09/08/asia/nepal-social-media-ban-protesters-killed-latam-intl

[56] Power, J. (1979). The Great Debate on Illegal Immigration—Europe and the USA Compared. Journal of International Affairs, 239-248.

[57] Qu, X. (曲星) (2013). 人类命运共同体的价值观基础. 求是, (4), 53-55.

[58] Rezabakhsh, B., Bornemann, D., Hansen, U., & Schrader, U. (2006). Consumer Power: A Comparison of the Old Economy and the Internet Economy. Journal of Consumer Policy, 29(1), 3-36.

[59] Ritchie, H., Rosado, P., & Roser, M. (2023). CO_2 and Greenhouse Gas Emissions. Our World in Data.

[60] Schmitt, M. N. (2010). Wings over Libya: The No-Fly Zone in Legal Perspective. Yale Journal of International Law Online, 36, 45.

[61] Singhal, T. (2020). A Review of Coronavirus Disease-2019 (COVID-19). The Indian Journal of Pediatrics, 87(4), 281-286.

[62] Sklair, L. (1997). Social Movements for Global Capitalism: The Transnational Capitalist Class in Action. Review of International Political Economy, 4(3), 514-538.

[63] Ssemanda, A. (2024). China's Concept of Building a Community of Shared Future for Mankind: A Game Changer for An Ideal World. DWC Development Watch Centre Kampala—Uganda. https://www.dwcug.org/chinas-concept-of-building-a-community-of-shared-future-for-mankind-a-game-changer-for-an-ideal-world/

[64] Stanislav, T., Natalia, Z. W., & Cui, Z. (2021). Technology Platform Competition between the United States and China: Decoupling and Sanctions Against Huawei. Вестник Санкт-Петербургского Университета. Международные Отношения, 14(4), 378-392.

[65] Stroeve, J., & Notz, D. (2018). Changing State of Arctic Sea Ice across All Seasons. Environmental Research Letters, 13(10), 103001.

[66] Vidan, G., & Lehdonvirta, V. (2019). Mine the Gap: Bitcoin and the Maintenance of Trustlessness. New Media & Society, 21(1), 42-59.

[67] Vranken, H. (2017). Sustainability of Bitcoin and Blockchains. Current Opinion in Environmental Sustainability, 28, 1-9.

[68] Wadanambi, R. T., Wandana, L. S., Chathumini, K. K. G. L., Dassanayake, N. P., Preethika, D. D. P., & Arachchige, U. S. (2020). The Effects of Industrialization on Climate Change. Journal of Research Technology & Engineering, 1(4), 86-94.

[69] Wang, J., & Gu, L. (2017). Why Is WeChat Pay So Popular? Issues in Information

Systems, 18(4), 1-8.

[70] Wang, Y. (2024). Wang Yi: Building a Community with A Shared Future for Mankind Lends New Impetus to the Building of a Brighter Future for Humanity. Ministry of Foreign Affairs People's Republic of China. https://www.mfa.gov.cn/eng/xw/zyxw/202405/t20240530_11332620.html#:~:text=In%20his%20visit%20to%20South%20Africa%2C%20President%20Xi,building%20a%20high-quality%20community%20with%20a%20shared%20future

[71] Wang, Y. (2025). Building A Global Community of Shared Future and Striving for Greater Achievements in Major-Country Diplomacy with Chinese Characteristics. QIUSHI Journal, Chinese Edition, No. 2. https://en.qstheory.cn/2025-05/16/c_1091765.htm

[72] Xinhua (2025). In a First, Humanoid Robots Work as Team in Chinese Auto Factory. Global Times. https://www.globaltimes.cn/page/202503/1330635.shtml?id=12

[73] Zhang, W., Zheng, T., Wang, Z., & Meadows, M. E. (2022). Reconstruction of Coastal Flooding Processes and Human Response at the End of the Liangzhu Culture, East China. Quaternary Science Reviews, 293, 107705.

Appendix: Timeline of the Rise and Fall of Capitalism

STAGES OF CAPITALISM	EMERGENCE TIME	COLLAPSE TIME	KEY EVENTS	REASONS FOR COLLAPSE
LIANGZHU CAPITALISM	3300 BC	2300 BC	Urban concentration	Natural disasters
SHANG DYNASTY CAPITALISM	1600 BC	1046 BC	Invention of writing	The feudal lords are too powerful
HAN DYNASTY CAPITALISM	202 BC	220 AD	Centralized control of currency	The central government cannot control the entire country
SONG DYNASTY CAPITALISM	960 AD	1279 AD	Use of paper money	External invasions
EUROPEAN CAPITALISM	Around the 16th century	1945 AD	Industrial Revolution	Two world wars

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