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The Marxist View of Science and Technology and China's Independent Innovation and Development

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Abstract: Science and technology have played an important role in the development of human society. Marx and Engels attached great importance to the development of science and technology, and had unique views on science and technology. Marxist view of science and technology has the scientific attribute of keeping pace with the times and seeking truth from facts. The Marxist view of science and technology points out that scientific progress is an important driving force for technological development, which provides important guidance for China to build an independent and innovative country. This paper expounds the formation and development of the Marxist view of science and technology, discusses its views on science and technology and social development, and then, under the guidance of the Marxist view of science and technology, points out the development and innovation of the Marxist view of science and technology in China at different stages in combination with the actual development of China. According to the scientific judgment of the Marxist view of science and technology, summing up the historical experience and lessons, this paper obtains the enlightenment of the Marxist view of science and technology on the development of China's independent innovation, and holds that China should continue to improve the scientific and technological innovation system and continuously strengthen the construction of infrastructure; focus on developing innovative human resources; create a good innovation atmosphere and build a new pattern of independent scientific and technological innovation and development.

Keywords: Marxism; View of Science and Technology; Independent Innovation.

1. Introduction

Under the background of informatization, the important position of innovation in economic and social development has gradually become prominent. Marxism has always emphasized the importance of science and technology. The Marxist view of science and technology has continued to develop with the evolution of history. It made an important summary of science and technology, and further studied the objective laws in its development process [1]. The development of science and technology determines the comprehensive national strength of a country to a large extent. Therefore, the Marxist view of science and technology has important guiding significance for improving a country's competitiveness. At present, China's development has entered a new stage, and the economy has shifted from high-speed growth to high-quality development. In the "14th Five-Year Plan" and the 2035 long-term plan, China pointed out the core position of innovation in China's modernization drive. Independence of science and technology must become the strategic support for national development. This is a major strategic arrangement made by China in light of the actual national conditions. The trend of science and technology and the scientific transformation of technology is increasing day by day, and the development of science and technology is constantly advancing. Under the guidance of the Marxist view of science and technology, combined with its actual development situation, China adheres to the strategy of strengthening the country through science and technology, strives to improve China's independent innovation capability, and strives to build China into an innovative developing country. This paper mainly expounds the development of the Marxist view of science and technology, expounds its views on science and technology and social development, reviews the course of its Sinicization, and discusses the road to the construction of socialism with Chinese characteristics under the guidance of the Marxist view of science and technology. By summarizing the previous experience and lessons, China should continue to play the key role of science and technology in improving the ability of independent innovation. The development of science and technology has brought great opportunities for China's scientific and technological innovation and is an important node for economic transformation and development. Therefore, the study of the Marxist view of science and technology and its practice in China is not only of theoretical significance, but also of great practical significance for China to realize the independent development of innovation.

2. Literature Review

With the rapid development of science and technology, scholars at home and abroad have also carried out rich research on the Marxist view of science and technology. Marx and Engels believed that science and technology were an important driving force in the development of society and history, and the development of science and technology caused comprehensive changes, which in turn promoted economic and social development [2]. Grundman pointed out that Marx highly affirmed the important role of science and technology, but Marx did not clarify the uniqueness of science and technology [3]. Habermas opposed the hegemony of science and technology. Technology and science were interdependent and mutually reinforcing [4]. Marcuse pointed out in "One-Dimensional Man" that science and technology have greatly improved people's material life and increased the possibility for human beings to explore the world [5].

While science and technology are developing rapidly,

scholars have also proposed to pay attention to the humanistic orientation of scientific development. Zhang Bo (2017) pointed out the importance of science and technology to modernization, and believed that science and technology were an important driving force for the progress of human society. While promoting the development of modernization, science and technology must also adhere to the "people-oriented" scientific development path [6]. Meng Xianping (2017) believed that the basic point of the Marxist view of the power of science and technology was to use science and technology to benefit mankind, maximize the important role of science and technology in social development, and reasonably avoid the risks brought about by science and technology [7]. Ma Bailian (2015) believed that it's very important to rationally use the Marxist theory of science and technology to guide the development of scientific and technological innovation in China [8]. Sun Min and Qi Chengshui (2018) analyzed that the development of science and technology should have a humanistic spirit and should not blindly worship science by comparing the views of Habermas and Husserl on science and technology. Only by critically looking at the development of science and technology and practicing the spirit of Marx's historical materialism can human rationally use science and technology [9]. Liu Ying (2016) believed that ecological Marxist theorists affirmed the key role of science and technology in social development, and the debate between Marxism and Green Thought helped people understand the ecological transformation of science and technology. While developing science and technology, ecological development should be taken into consideration, rather than ignore one or the other [10].

Scholars have also conducted research on the relationship between the Marxist view of science and technology and independent innovation. Tan Rongfeng and Wang Gang (2006) pointed out that according to the new development trend, China further clarified the important strategic position of scientific and technological innovation for its reform and development through the rich innovation of the Marxist view of science and technology [11]. Yang Zhen (2004) believed that "science and technology is the primary productive force" was a new development of the Marxist view of science and technology and production mechanics based on China's actual national conditions. Scientific and technological innovation is the key to China's leap-forward development. It's necessary to actively promote scientific and technological innovation and seize the development opportunities [12]. Wu Haijiang et al. (2000) proposed that Deng Xiaoping's understanding of the Marxist view of science and technology achieved a major innovation, clearly pointed out the key role of science and technology in economic and social development, and laid a theoretical foundation for China's implementation of science and education to rejuvenate the country, which was of great significance for its development [13].

By sorting out and reviewing domestic and foreign literatures, it's easy to find that scholars have comprehensively discussed the close relationship between science and technology and economic and social development, and have also profoundly analyzed the need to pay attention to humanistic care in the rapid development of science and technology. Domestic scholars also made an overview of the Marxist view of science and technology and China's innovative development, pointing out the important guiding position of the view of science and technology to China's innovative development. The Marxist view of science and technology not only covers science and technology, but also involves all aspects of social development. Therefore, the discussion of the Marxist view of science and technology should not only be analyzed from a single level, but should comprehensively consider the richness of its connotation for further research and discussion. However, the systematic and holistic research on the Marxist view of science and technology still needs to be further enriched. By sorting out the practical history of the Marxist view of science and technology in China, this paper systematically discusses the guiding role of the Marxist view of science and technology as a whole, summarizes and analyzes the enlightenment of the Marxist view of science and technology for China to build an independent innovation-oriented country, enriches the research field of the Marxist view of science and technology.

3. The Formation and Development of the Marxist View of Science and Technology

3.1. The Formation of the Marxist View of Science and Technology

The Marxist view of science and technology was founded by Marx and Engels. Through the inheritance, development and improvement of future generations, its development was closely related to social conditions, ideological and theoretical background, and the development of science and technology. Based on historical materialism, Marx studied the development of social from actual production labor. The concept of practice was the core of scientific and technological research [14]. The Marxist view of science and technology was a generalization and summary made by observing the laws of science and technology and its development through the understanding and understanding of nature. It's the ontology and epistemology of Marxism on science and technology [15].

From the second half of the 18th century to the middle of the 19th century, society's demand for technology made science take a big step forward. Under the capitalist mode of production, natural science no longer indirectly served the production process, but directly participated in the production process. According to the level of development of social productive forces at that time, Marx proposed that science and technology were the basis for productive forces. He believed that productive forces were driven by science, science and technology were the driving force of production. At the same time, the development of production advanced technology, and technological change needed scientific guidance. Science guided production practice, technology was the key to practice, and the development of science and technology was ultimately to serve production [16]. Engels pointed out that the emergence and development of science and technology were initially determined by production. The progress of science and technology was premised on production, and the demand for technology in the production process promoted the development of science and technology. Throughout the course of social development, every scientific and technological revolution was a subversive scientific and technological revolution. Guided by the natural Science Revolution, the production efficiency has been greatly improved, and human beings have been liberated from traditional labor. These historical facts fully proved Engels' view.

3.2. Viewpoints of the Marxist View of Science and Technology

3.2.1. Understanding of Science and Technology

The formation of the Marxist view of science and technology deepened the understanding of the nature of science and technology and revealed its objective laws. Marx and Engels held that science was based on practice, and all science needed to be tested through practice. Because science was the product of social development, it's the understanding and interpretation of nature by human beings through practice, and it's the theoretical generalization of objective laws, only by using it in practical production can people test whether it has made a reasonable explanation for nature [17]. Science and technology are unified, science is the expression of productive forces, and technology is the practice of man to nature. Science is a summary of understanding the objective laws of the world, and technology is a tool for human beings to transform nature. Science is law and systematic knowledge; technology is method, experience and knowledge. The interaction between science and technology breaks the theological point of view, and the two develop rapidly and apply them to practice to jointly promote social development.

3.2.2. Science and Technology and Social Development

Marx proposed that science was the general productive force and technology was the real productive force. He also specifically proposed that science and technology were both productive forces, but science was the general productive force and technology was the real productive force. The two were interrelated and different. Science and technology can coordinate relations of production, change the mode of technological innovation, promote changes in productive forces, liberate labor, and realize economic transformation. The rapid development of science and technology and social life have been continuously strengthened and penetrated into economic and social development, becoming the main driving force for economic development. In general, science and technology are the products of the development of social production. Science and technology will in turn affect social production, bring about changes in production methods, and promote rapid social development. Science and technology have affected all aspects of the economy and society.

4. The Sinicized Marxist View of Science and Technology

The Communist Party of China has always emphasized the role and status of science and technology in its economic and social development, and under the Marxist view of science and technology, based on China's actual national conditions, in the practice of building socialism with Chinese characteristics, China has made a strategic deployment of building an independent of country and continuously enriched and developed the theory that science and technology are productive forces. Based on this, this paper mainly sorts out the historical context of the theoretical view of science and technology of socialism with Chinese characteristics, and analyzes the specific practice and application of the Marxist view of science and technology in China.

4.1. The Concept of Science and Technology in Mao Zedong Thought

Mao Zedong's scientific and technological thought was the inheritance and development of Marx, Engels' scientific and technological thought and Lenin's scientific and technological thought [19]. After the founding of New China, Mao Zedong pointed out that socialist construction must rely on science and technology by summarizing the experience of scientific and technological development in the world, and after continuous summarization and practical exploration. China must use advanced science and technology to improve its own ability of innovation, strive to catch up with advanced countries, and make every effort to quickly reach the world's advanced level.

Practice is the only criterion for testing truth, science and technology must be applied to practice. Of course, science and technology cannot be smooth sailing in the process of practice, and will always face challenges and problems. Improve the technology of science according to actual conditions, so that science and technology can better serve economic and social development. Mao Zedong attached great importance to the function of science to transform the world, emphasizing the use of science and technology to transform the world. In order to transform the world, Mao Zedong clearly stated that Chinese must recognize the objective laws of the world, discover correct theories from it, and carry out scientific practice through the guidance of correct theories, so as to transform the world [19]. By constantly summarizing historical experience and correcting problems in a timely manner, science and technology will be guided to a reasonable track to promote the development of productive forces. Mao Zedong not only emphasized the importance of developing science and technology, but also clearly proposed to attach importance to science and technology education and talent training. He believed that China must build a grand team of scientific and technological talents in order to be self-reliant. At the same time, actively learning from successful foreign experiences with a critical eye was of great significance. Chinese cannot completely copy exactly, but must strive to form their own development model based on its actual development conditions, and walk out of the road of socialist construction with Chinese characteristics. In addition, his policy of "letting a hundred flowers bloom and a hundred schools of thought contend" still has far-reaching guiding significance for China's scientific and technological innovation. Under the guidance of this policy, China's scientific and technological field has continued to innovate and develop, and its independent innovation capabilities have gradually improved.

4.2. The Concept of Science and Technology in Deng Xiaoping Theory

Deng Xiaoping Theory put forward unique theories and insights on the development of science and technology according to the new trend of the development of science and technology. On the basis of summarizing China's historical experience and learning from the historical experience of other socialist countries, combined with the specific practice of China's reform, opening up and modernization, he formed the concept of science and technology in Deng Xiaoping Theory. Science and technology were the primary productive forces, they served economic construction and became important driving forces for economic development. Only the development of science and technology can achieve rapid economic development. In addition, he also pointed out that it's necessary to respect knowledge and talents, strive to cultivate science and technology experts, pay attention to science and technology education, and learn from foreign

advanced science and technology. The development of high technology is a prerequisite for realizing industrialization development. A good scientific and technological system can boost economic development and solve the difficult problem of disconnection between China's economy and innovation. These scientific and technological thoughts of Deng Xiaoping are scientific thoughts derived from summarizing the laws of China's economic and social development under the guidance of the Marxist concept of science and technology. China strives to study science and technology and continuously improves its capabilities of independent research, and the development of science and technology has made great progress.

4.3. The Concept of Science and Technology in the Important Thought of "Three Represents"

The important thought of "Three Represents" comprehensively summarized the Communist Party's historical experience. Starting from China's adaptation to the new situation and new tasks, it's an important theoretical weapon to promote China's self-improvement and development [20]. Jiang Zemin clarified the core position of science and technology. He proposed a national promotion strategy based on science education, and insisted on putting people first. Science and technology are the key to economic and social development, and talents are the core of scientific and technological development. Therefore, the key to economic and social development lies in the quality of talents. China should pay attention to the cultivation of talents, fundamentally improve the level of professional technology, and actively give play to the leverage role of science and technology in economic and social development. In addition, Jiang Zemin also pointed out that it's necessary to promote the reform of China's scientific and technological system, continue to improve the construction of the scientific and technological legal system, provide institutional guarantees for scientific and technological development, strive to build a development path with Chinese characteristics, improve relevant systems, build a scientific and technological system that is in line with China's basic national conditions and adapts to the current economic development, and solve the problem of incompatibility between China's scientific and technological and economic development.

4.4. The Concept of Science and Technology in the Scientific Concept of Development

The first priority of the Scientific Outlook on Development is development. The Scientific Outlook on Development also viewed the Marxist concept of science and technology from the perspective of development, and kept pace with the times to promote the innovation and practice of the Marxist concept of science and technology in China [21]. The Scientific Outlook on Development was based on China's reality, and has formed a series of scientific and technological viewpoints by analyzing the characteristics of China's development. The Scientific Outlook on Development also emphasized the importance of talent training, and believed that China should implement the strategy of strengthening the country with talents. At the same time, deepen the reform of the scientific and technological system, strive to improve the level of scientific management, and strengthen the connection between science and technology and the economy, so that the two form a virtuous circle and continuously promote the development of socialism in China.

4.5. The View of Science and Technology in Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era

In the critical period of China's entry into socialism, Xi Jinping put forward a series of new ideas and theories, inherited and developed the Marxist view of science and technology, and faced the new situation at home and abroad, and formed his own view of science and technology [22]. Xi Jinping proposed that "science and technology is the foundation of a country's prosperity, and innovation is the soul of national progress." Chinese must strive to develop the level of science and technology, adhere to independent innovation, accelerate scientific and technological innovation in various fields, and focus on scientific and technological innovation, and strive to build their own country into an innovative power. Under the background of informatization, China must actively view the opportunities brought by the scientific and technological revolution, lead the new situation of China's economic development, and clearly realize the important role of science and technology in realizing the great rejuvenation of the Chinese nation. Therefore, China must adhere to the innovation-driven development strategy and clarify the goal of building a strong country in science and technology. Xi Jinping also emphasized that China should actively create a good innovation environment, provide institutional guarantees for scientific and technological innovation, stimulate the vitality of talents, pay attention to cultivating scientific and technological talents, and cultivate innovative teams of scientific and technological talents.

5. Enlightenment for China's Independent Innovation and Development

Building an independent innovation-oriented country with Chinese characteristics is a concrete manifestation of the Sinicized Marxist view of science and technology. Science and technology always exist in economic production. Under the background of economic globalization, science and technology play a decisive role in building an independent innovation-oriented country. By summarizing the practical development of the Marxist view of science and technology in China, this paper summarizes its enlightenment to the development of China's independent innovation.

5.1. Improve the Scientific and Technological Innovation System

One of the keys to the development of science and technology in China is to promote the reform of the scientific and technological innovation system, promote the coordinated development of science and technology and the economy, so that the two can form a virtuous circle mechanism and improve the ability of independent innovation. Therefore, it is necessary to break through the shackles of scientific and technological development, establish and improve the scientific and technological innovation system, and fully stimulate people's enthusiasm and creativity for innovation. In addition, it is important to continuously strengthen and improve infrastructure building, and make reasonable overall planning for the development of science and technology. Besides, it is essential to consider the current economic development, but also pay attention to the long-

term development of China.

5.2. Focus on Cultivating Innovative Talents

Talent resources are the core of scientific and technological innovation and development, and talent training should be placed at the core of scientific and technological development. China should gather human resources together and strive to build a strong and innovative talent team. It is not only necessary to pay attention to domestic talent training, but also to establish a talent introduction mechanism to attract foreign outstanding talents, so that outstanding talent resources from all over the world can flow to China, so as to improve China's core competitiveness internationally and create a new situation for China to build an independent and innovative country.

5.3. Create a Good Atmosphere for Innovation

To develop science and technology, China must develop an innovation culture, create a good innovation atmosphere, and cultivate the innovative spirit of the whole society. Developing an innovation culture and creating an innovation atmosphere can attract talents, stimulate the creativity and enthusiasm of scientific and technological personnel, provide a display platform for talent backbones, and promote the development of science and technology in China. The development of science and technology should also pay attention to humanistic care, so that scientific and technological achievements can benefit the people more, realize the sharing and inclusiveness of scientific and technological achievements, and stimulate the enthusiasm of the whole people for scientific and technological innovation. In addition, it is necessary to continue to deepen the reform of education, form an environment conducive to the cultivation of innovative talents, and build a new pattern of independent scientific and technological innovation and development, so that everyone is eager to become talents and talents can fully display their talents, so as to contribute to the development of independent innovation.

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