



# The Historical Significance of Mohist Scientific Thought

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**Abstract:** Mozi is a great scientist in ancient China and found the Mohist School, which was the most scientific spirit of the academic group at that time. The book of Mozi not only contains a large amount of scientific knowledge, but also is a landmark in the history of science in ancient China. Based on the theoretical perspective of STS and the primary material of Mozi, through summarizing the basic characteristics of Mohist scientific thought, this essay will reveal its historical significance and modern value.

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There were many thinkers in Spring and Autumn Period in ancient china, although they discussed different topics, their respective focuses were almost invariably pointing to main aspects of human relations, society, and politics. What is different is that, as one of the members, Mozi has made a more detailed study of science in addition to above aspects. From this point of view, Mozi appears to be unique among them. Mozi, his first name is Di and surname is Mo. He was a great thinker in pre-Qin period in China and the founder of Mohist School, which was an academic group. Additionally, his disciples were numerous, widely distributed throughout China. And his thought flourished in the whole Warring States Period. The theory and thought of Mohist School are embodied in the book of Mozi. It is a collection of works of Mohism School, which including fifty-three pieces of work of various fields. Among them, Mohist attached the most

importance to science, through constantly exploring and researching, they have made brilliant achievements, and have also made immortal contributions in the history of science in China and even in the world.

## 1 The characteristics of Mohist scientific thought

### 1.1 Taking the objective nature as an independent research object

Among the thinkers of the pre-Qin period in ancient China, there were many discussions about the nature. While, almost all of them were metaphysical thinking, such as the mainstream view of interaction between heaven and human, the theory about heaven and man united as one. They did not objectively study or interpret the natural phenomena, and did not regard the nature as an independent research object.

Mozi and Mohist members were mostly handicraft workers with a strong tradition of crafts, and mastered various practical production skills<sup>[1]</sup>. Meanwhile, as an academic group, Mohist also had a high-level knowledge. While engaging in production practice, they were able to focus on the experience in the process of production, explore the objectivity of the complex and changing nature, and solve the emerging problems in the progress. Mohist School regarded nature as an independent research object, and held the purpose of scientific activities was to correctly understand the real nature, explore its causes, and solve problems existing in practice. From the comprehensive view of various chapters in the book of Mozi, Mohist objectively described a variety of natural phenomena, analyzed and studied their causes, and concluded a large amount of scientific theories in the natural sciences. These

remarkable theoretical achievements all came from the repeated observation of the objective phenomenon, which was the result of an objective understanding the natural world. Mohist School attached great importance to the observation of the objective world, turned the research object from human beings to the objective world, which is also an important reason for the brilliant achievements they achieved in the field of scientific thinking.

### **1.2 Focusing on scientific experiment activities and scientific evidence**

Taking the objective nature as the independent research object, Mohist scientific thought not only stayed in the level of direct observation and imagination, but also participated in the scientific experiment activity, which highlights Mohist scientific positivism spirit and lays a foundation for the formation of Mohist scientific theory. In the book of Mozi, many items in its optical theory and mechanical theory have detailed experimental records<sup>[2]</sup>.

Ancient China never lacked excellent scientific achievements, and these scientific achievements were at the forefront of the world at that time. However, there were defects in theoretical research and summarization based on scientific experiments with rational thinking. Mohist paid attention to the role of practice, and insisted on production by themselves, thus they could directly obtain abundant scientific and technological materials from it. In the meantime, Mohist had a scholarly tradition, which can use rational thinking to systematically conduct scientific data. And then with scientific experimental methods, Mohist School scientific theory is more valuable and reliable. Mozi and his disciples carried out a number of scientific experiments, such as pinhole camera experiment, light and shadow experiment, etc. Although it was not as precise and rigorous as modern scientific experiments, it showed Mohist's scientific attitude of seeking truth and reality in the objective world.

### **1.3 Scientific and technological value of utilitarianism and pragmatism**

Although Mohist ideology attached great importance to benefit, they did not merely consider the world's benefit in monetary or material terms. The Mohists usually mention benefit together with concern or care<sup>[3]</sup>. Whether the thought of universal love, condemning offensive warfare, exalting worthiness, or the theory of moderation in use, modernity in funerals, condemning

music, none of them can escape from benefit. And they were different forms of expression of benefit.

"The business of the benevolent man must be to seek assiduously to promote the world's benefits and to eliminate the world's harms<sup>[4]</sup>." The Mohist School regarded the promotion of world's profits and the elimination of world's harms as the goal of benevolent man<sup>[5]</sup>. This kind of profit is not focused on the individual, but on the great benefits of the world, and for the benefits of the social class they represented. The benefit advocated by Mohist was not only an empty theory for social and political appeals, but also focuses on the level of production practice. Based on pragmatism, proceeding from the actual interests of the people, and thus benefiting the world. This is also one of the motivations of Mohist to attach importance to scientific thinking.

Mohist scientific thought paid attention to the practicability and value of science and technology in the process of production practice. Therefore, Mohist's study on objective nature was a utilitarian scientific view. "Meritorious service is benefiting the people", "Meritorious service: it does not await a time like summer and winter garments do<sup>[6]</sup>." It shows that the essence of Mohist utilitarianism was serving people, and always. In the book of Mozi, some simple machines, such as pulleys and mobile ladders, they were made by the principle of lever and bevel. The purpose of them is to reduce people's labor intensity, improve production efficiency, and make it more conducive to practice.

Mohist technology takes whether it is beneficial to the people to evaluate its value. Gongshu Zi carved some bamboo to make a bird. When it was completed, he flew it. For three days, it did not come down. Gongshu Zi took himself to be supremely skillful. However, Master Mo Zi held an opposite view, and he believed that making a bird was not like making the linch-pin of a cartwheel. Therefore, in terms of what is called an achievement, what is of benefit to people is spoken of as skillful, whereas what is not of benefit to people is spoken of as unskillful<sup>[7]</sup>. Therefore, promotion of world's profits and the elimination of world's harms was not Mohist social political thought, but also a significant feature of his scientific thought.

## **2 The historical significance of Mohist scientific thought**

Mozi was a scientific saint in pre-Qin period in ancient

China. His contribution in the history of science was not only an epochal change, but also has reached the highest level in the world at that time<sup>[8]</sup>. As an ignored part of the world history of science, studying Mohist scientific thought should explore not only its historical value, but also its modern significance.

### **2.1 Creating the tradition of focusing on scientific research and theoretical exploration in ancient China**

In the pre-Qin period, compared with other thinkers and schools, Mohist School paid more attention to scientific research and theoretical exploration. The members in Mohist School had the both role of scholars and artisans. Most of the members came from the bottom of society, and engaged in handicrafts and agricultural works. Compared with other school members, they had abundant direct social production experience. Therefore, they were able to combine the knowledge, theory and method possessed by scholars with the craftsmanship in the actual production. Moreover, in real life, they have indeed achieved the combination and unity of rationality and practice, and formed a unique scientific theory.

Hu Shi, a famous Chinese philosopher and thinker, once commented on the various articles on optics and mechanics in the book of Mozi show. It can be seen that the Mohist scholars can really do many field experiments, and this is the true spirit of science<sup>[9]</sup>. Only through continuous exploration can scientific theory be extracted. Mohist scientific thought is based on the practice of science and technology in ancient China, with the objective nature as an independent cognitive object, combining rational thinking with practical experience, and then conducting scientific experimental activities and scientific theory exploration.

In addition, as mentioned above, Mohist attached great importance to utilitarianism, which is also embodied in Mohist scientific thought. Taking “promoting the world’s benefits and eliminating the world’s harms” as the starting point and the foothold of their idea, it combined scientific theory with utilitarian, and formed a relatively unique value concept. Mohist scientific thought not only overcomes the disadvantage that Confucianism contempt for the value of science and technology, but also eliminates the blindness that Taoism separates general knowledge from specific scientific and technological knowledge<sup>[10]</sup>. Compared with Confucianism and Taoism, Mohist scientific thought was the most objective and not unilateral

thought in ancient Chinese scientific and technological thought system.

### **2.2 Constituting one of the main sources of the development of human scientific thought**

Regarding to the source of modern scientific development, most people believe that it originated from ancient Greek culture and then revived in modern Europe. If we explore this problem in a comprehensive and systematic way, we will find that there should be multiple sources of human scientific thought development, among which Mohist scientific thought is one of the important of them. There were many artisan theorists in Mohist School members. Although their scientific activities were unsystematic, fragmented, and there were no strict scientific procedures or scientific regulations to follow, they have realized the combination of craftsmen tradition with scholars. And the craftsman tradition of scientific activities is also a valuable scientific tradition. Mohist scientific activities and their academic research methods are similar to the modern scientific community. Although Mohist members were not scientists in modern sense, they were all skilled craftsmen and craftsman theorists with high scientific and technological level and quality at that time. They have created many miracles in the history of ancient science and technology. The book of Mozi is an encyclopedic classic<sup>[11]</sup>.

From the definition of physics, mathematics and other disciplines in the book of Mozi, it can be seen that the Mohist can use the rational thinking ability to explore and draw some scientific conclusions accurately. For instance, “level is being the same height”<sup>[12]</sup>. There are still many such concepts. Besides, Mohist School also established the understanding of natural phenomena on the basis of scientific experiments, and obtained scientific knowledge through experiments, which has been discussed before. This is the result of their scientific experiments.

Mohist scientific thought plays a crucial role in the history of ancient Chinese science and even in the history of world science. In addition to being able to use the rational thinking ability to observe, analyze and summarize problems, Mohist School can also carry out natural scientific research in combination with scientific experimental activities, which has a modern scientific seed and is an excellent tradition in the history of human science. The book of Mozi, which contains many scientific achievements, is a monumental work in the ancient science history. Mohist scientific thought

is an ignored link in the history of science, and should also constitute one of the sources of the development of human scientific thought.

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