ATLANTIS PRESS
Advances in Social Science, Education and Humanities Research, volume 232
4th International Conference on Arts, Design and Contemporary Education (ICADCE 2018)

An Interpretation of the Core Concepts of Kuhn's "Structure of Scientific Revolution"

Yanling Mei
School of Philosophy and Public Administration
Jiangsu Normal University
Xuzhou, China

Pengcheng Li*
School of Philosophy and Public Administration
Jiangsu Normal University
Xuzhou, China
College of Humanities and Social Science
Nanjing University of Aeronautics and Astronautics
Nanjing, China
*Corresponding Author

***Abstract*—Through the interpretation of Kuhn's "Structure of the Scientific Revolution", it is found that in the relationship between the signifier, the indicated clues, and the relationship between the book and other texts, designatum, on the side of "paradigm" of signifier clues, the concept of "science community" refers to the core concept of Kuhn. The real intention in the book is to build the "science community" in reality.**

Keywords—scientific community; paradigm; "Structure of Scientific Revolution"

I. INTRODUCTION

The term "paradigm" in Kuhn's "Structure of the Scientific Revolution" is a hot topic in academic circles. It has been widely used in various subject areas and it is considered that the "paradigm" is the core concept of his works. From the outside, the "paradigm" concept in the catalogue and the linguistic expression in the text occupy a major position. The "scientific community" is like the dwarf beside the giant, and its position is not prominent. Entered the article, it is discovered the concept of the "scientific community" which is closely related to the "paradigm" embodied Kuhn's true intentions in terms of the division of reality, the difficulties in its establishment and description, and the necessity and importance of building an academic community. It is the core and soul of Kuhn's Structure of the Scientific Revolution.

II. THE "SCIENTIFIC COMMUNITY" OF "DESIGNATUM" IN THE "STRUCTURE OF THE SCIENTIFIC REVOLUTION"

Kuhn emphasized his academic background and the reasons for writing the book in introducing his academic approach and the "preface" of the book's writing process. Because of the "outdated" scientific theories and practices recorded in the history of science, he sprouted the philosophy of science as his main research direction and pursued the concept of the essence of science. However, Kuhn himself had spent most of the year doing research in fields that had no obvious relationship with the history of science. The results and problems found were the same as those found in the study of the history of science. This caused his deliberate attention. From 1958 to 1959, he conducted research at the Center for Advanced Studies in Behavioral Sciences, where he lived with a community of social scientists, and in daily life and research exchanges he found that there was a great deal of difference between the community of social scientists and the community of natural scientists that he had been trained. This difference is beyond his expectation. The obvious difference between the social scientist and the community of natural scientists of the view of legitimate scientific issues and methods made him have a source to find this difference and made him realize that the role of the paradigm in scientific research.

From these expressions we know that the reason for the author's academic turn is to understand and interact from the natural sciences through the history of science to the two distinct academic communities of philosophy and history. It conveys the author's information on the causes of the changes in the emotions and ideas, and emphasizes that the book's creative theme is to reveal the differences and sources of the two communities. Then, when Kuhn pointed out problems with current textbook records, he stressed that his purpose of the "Structure of the Scientific Revolution" was to study the "scientific view of the scientific community." He wanted to outline a different view of science and make the "truth" can emerge from the historical record of the research activity itself [1].

However, practical textbooks or other literature materials are the scientific methods used to compile these textbook materials and to use the operational and logical skills of linking these materials with the theoretical summary of textbooks. The result of putting the two together is almost always understood as a phenomenon of scientific methods without exception. It has brought to the historian concerned with the development of science two tasks that are "more and more difficult to accomplish." This makes Kuhn generated doubts to the views. The historiography revolution thus took place and "maybe science is not developed through the accumulation of individual discoveries and inventions." Historical historians are no longer pursuing the eternal contribution of an old science to our current superiority, but

trying show the historical integrity of the science in its prevailing age. At this time, Kuhn talked about the scientific community with the relationship between the research team and the relationship between teachers, students, brothers and generations. Kuhn believed that he not only learned the achievements of his predecessors, but also changed his thinking and focused on “in a certain period of time, there is always an obvious random element in the constituent parts of the beliefs that a scientific community believes in, which includes the accidental events of individuals and history [2]. His writing approach is actually different from the simple analysis of scientist's own activities in the past. He turned his attention to the research on the diachronic and communal tense of the research team with the "paradigm" as the appearance standard.

III. THE PARADIGM OF “SIGNIFIER” AND THE SCIENTIFIC COMMUNITY OF "DESIGNATUM" IN THE BOOK “STRUCTURE OF THE SCIENTIFIC REVOLUTION”

When Kuhn discusses the history, nature, and content of conventional science, starting from the works of various members of the "Scientific Community," after summarizing the concept of "paradigm" and its role in the scientific process, the question of which is the first between the rules, the paradigm, and the conventional science is raised. He first asked us to consider how historians separated the special status of commitments that have been described previously as recognized rules. Then, "historians must compare the community paradigms with each other and compare them with the popular research in the community. Identifying the obvious or implicit separable factors out of their more global paradigms and becoming their rules. Anybody who wants to describe or analyze the evolution of a particular scientific tradition must find out such recognized principles and rules." However, “If the study of traditional luxuries is understood in terms of rules, then a set of rules that will constitute a known conventional research tradition were needed and it will become an effort of continuous and severe setback.” This is only Refers to the paradigm priority; this is just the priority of paradigm of signifier; afterwards, it is said in the statement, “Scientists can agree to confirm a paradigm, but they do not agree with the complete interpretation or rationalization of the paradigm.” “The existence of a paradigm does not mean that there are any set of rules,” and the paradigm do not needs discoverable intervention of the rules to determine the conventional science" and "be rooted in the nature of science education" - that is, the cultivation of members of the scientific community. In accordance with such logic, the author puts forward the question of what is the relation between the “common science, rules, and paradigms”. He first explained that the “frustration” brought by the rule's priority indicates that the paradigm has priority over rules. Secondly, the paradigm is prioritized over conventional science. Finally, four reasons for the paradigm priority are elaborated from the front, and a pave for the discussion of the next chapter. These are all around the "scientific community". Finally, with a researcher, a physicist, and a chemist, three different answers to the question of whether a single nitrogen atom in the atomic theory is a molecular problem, state the difference of paradigm may sometimes have important consequences. This will be a step-by-step demonstration of the "referential" in the text as a "scientific community."

IV. THE EMERGENCE OF "SCIENTIFIC COMMUNITY" BECOMING "SIGNIFIER" IN THE CONCLUSION OF "STRUCTURE OF SCIENTIFIC REVOLUTION"

Kuhn focused on discussing how science developed during the course of scientific development and analyzed the nature and inevitability of the scientific revolution. He believed that the "revolution" of science is also a revolution of the "scientific community." Kuhn took another example of the scientific changes in natural sciences such as astronomy, electricity, and physics, explaining that “the paradigm changed could cause the world changing. He believes that in the scientific revolution, scientists are guided by a new paradigm to adopt new tools and pay attention to new areas, they will also see new and different things, which means that the paradigm shift has indeed changed scientists' views on their research institutes and the world. The same world is a different world in the eyes of everyone; Gestalt transformation can illustrate the basic prototype of the world of scientists [3]. This result affects the students themselves and the students of the community members, resulting in changes in their learning, training, training methods, and content. These changes are produced by scientists themselves in the process of long-term experiments, scientific research work, or accidental or inevitable, or rely on the efforts of the cumulative or relying on the talents of scientists themselves, mainly reflected in the visual conversion - that is, the way to look at the research object is to highlight the change of appearance, but it actually reflects the world view of scientists and their groups, and reflects the contemporary environment and scientific research atmosphere at that time.

Although the world has not changed because of changes in the paradigm, scientists have been working in a different world after the paradigm shift [4]. That is to say, the object of scientific research - the natural world itself has not changed, but only the paradigm of research has changed. It is these changes that have led scientists to study not only the fields but also the world of life−−communicate with peers through professional works to achieve more professional attention and participation; making use of using textbooks to influence later studies cultivate new members of the community; to popularize popular science through popular science readings, etc.−then the world that has extended to the lives of ordinary people has changed. Second, although historical books, including the history of science, are described by people and their behavior as the clues, first of all, due to the process of human understanding of nature, human history, and human beings, secondly, it was restricted by the conditions of social productivity development and human interaction at that time. The relative changes in the measurement of people’s standards were relatively small in terms of time. The understanding of the “scientific community” naturally did not enter the field of vision of scholars, and the construction was not mentioned. After the rise of capitalism, the tremendous development of productivity, the increasingly close interpersonal exchanges between people, the changes in the environment brought about by the interaction between man and the environment, and the

mobility, complexity, and variability of people and factors such as increasingly complex relationships between the two factors have made the understanding and construction of the "scientific community" increasingly important. Kuhn's research on people has reflected this change from the individual to the group. Answered the value and significance of the group in today's production, that is, the "science community" is not only theoretically, especially in reality, it is necessary, difficult, and urgent to build and significant.

Science is the process of understanding, researching, expressing, and applying objects. It is also a process from shallow to deep, from surface to surface, and from coarse to fine. Kuhn's arguments and previous scholars' texts are like the "rabbit and duck conversion map." In our study of human history, the behavior of individual characters is the main line. This brings many problems, such as the elimination of some contribution of "unnamed laborers and science and technology practitioners", which has led people to mistakenly believe that the contingency of individual scientists occupies an important position in the development of science. Not only has it not been as scientists wished - that is, through their work, people should eliminate some of the mysteries. The understanding and practice of phenomena, etc., thereby enhancing the confidence in man's own abilities, has in fact increased the "superstition" of mankind - that is, the more advanced science is, the more superstitious it develops with it; led the loss of the connection of science and technology with other technologies of the same generation and with people's life at that time, more importantly, artificially created a lot of scientific myths and science masters, and set many obstacles for later studies. Kuhn opened up a new path for the study of the history of science from the study of scientists themselves to the relationship between these geniuses and their life and the development and succession of them and the entire scientific research team. The transition from the study of people-oriented veins to the research of space-time unification of diachronic and synchronicity based on objective “paradigms” has not only provided new research methods and pathways for the study of the history of science, but also has served as an academic community, but also open up new research trends.

Kuhn believes that the reason for why the research and construction of the "Scientific Community" is so important and urgent is the law of human development. In the primitive society, due to the low level of productivity, people form a blood community to fight evil nature, to obtain meagre food to meet the needs of survival; with the increase of productivity and the accumulation of surplus products and possessed by the strong such as tribal leader in the community and the relationship between people have also undergone corresponding changes: the blood community has gradually been replaced by the geo-community of the class society, and this situation has continued until the industrial revolution and even today. Because scientific researchers are engaged in theoretical research and development work that is far from reality, their combination of features such as more complexity, variability and concealment makes it difficult for them to recognize, determine, and study. Due to his time and his own experience, Kuhn keenly captured the problem of this era: academic research has in reality changed from a single-handed approach to a team--"academic community" transformation, and its understanding and research in theory is still a blank space. In other words, the various "rules" formed by the scholars' research institutes in the past have not adapted to the changes in this situation, and have, to a great extent, hampered the pace of scientific research and technological development.

Furthermore, combining this work with his other work, "the necessary tension", the "scientific community" is at the heart of his speech as he explicitly or implicitly suggests.

If we combine this book of Kuhn with his works of different periods and the era of his life, it is found that the notion of “science community” is not only the core concept of structure of scientific revolution, but also “the necessary tension”. As Kuhn says In Kuhn’s preface, “throughout structure of scientific revolution,” I use the research topic to identify different scientific communities, thereby marking certain specific scientific communities [5]; “If we want to list the factors that a member of the community seems to agree with to illustrate this agreement, the question arises… Obviously, the consensus I sought for this kind of opinion does not exist at all [6]. The concept of paradigms is the missing link in the book I wrote. The first draft is written in which the paradigm has unfortunately acquired its own independent life. Most readers of this book only know the more comprehensive use of this term that led unavoidable confusion. The question of the paradigm mentioned there actually applies only to the original meaning of this term. Although these two meanings are important to me, they must be distinguished. The term "paradigm" is only applicable to the first meaning [7]". "Any individual can obtain reliable knowledge as long as he follows. But I have always believed that although science is carried out by individuals, scientific knowledge is in essence the product of the group (author himself added) [8]; “One of the factors combining the members of any scientific community, but also distinguishing from other among the members of the type group is that they have a common language and specific jargon [9], etc. Kuhn’s many expressions in different articles have clearly defined the core position of the “scientific community”. The "paradigm" of the independent life is unfortunately obtained.

V. CONCLUSION

Due to the above factors, Kuhn took "paradigm" as the dominant core concept of his work. In fact, Kuhn began his theoretical discourse on the core concept of "scientific community" as its recession. In the process of introducing and learning his theory and ideological trends in our country, our scholars should not only have a deep understanding of the superficial meanings of the work, but must pay close attention to the lines between them; and they should contact the relationship between the author and other texts and works at the same time, understanding the author's true intentions.

Kuhn's theory is the construction of the "scientific community" based on western capitalist society. The reality basis is very different from that of China. However, it can provide inspiration to China’s own scientific research team. We must proceed from the actual situation in our country, and take full account of and take into consideration regional

differences and consider academic characteristics and laws. We must make overall plans for the country and take into account the long-term nature and stage of the academic research. Based on the basic principles of the two-way investigation and construction of research projects and research teams, the key points for the discipline construction at each stage are determined in the preconditions that developed regions help underdeveloped areas and the subjects are comprehensively and harmoniously developed, and for the purpose of maximizing the interests of nations and peoples.

REFERENCES

[1] Thomas Kuhn "structure of scientific revolution" Translated by Jin Wulun Hu Xinhe Peking University Press 托马斯-库恩 《科学革命的结构》金吾伦 胡新和译 北京大学出版社

[2] "Thomas Samuel Kuhn 1922-1996" by Jade Z · Birchwood George E. Smith《托马斯·萨谬尔·库恩 1922——1996》 杰德·Z·布奇伍德 乔治·E·史密斯著

[3] Translated by Guo Guichun Yin Jie Li Xiaobo Science and Technology and Dialectics Volume 16 Number 6 December 1999 郭贵春 殷杰 李小博译 科学技术与辩证法 1999 年 12 月第 16 卷第 6 期

[4] Thomas Khun " the necessary tension" translated by Ji Shuli Fan Dainian Luo Huisheng et al Fujian People's Publishing House 托马斯-库恩《必要的张力》纪树立 范岱年 罗慧生等译 福建人民出版社.