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Paradigm shift in traditional Mongolian medicine in the 18th century

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Abstract: As Thomas Kuhn stated in his book "The Structure of Scientific Revolutions", revolution is an example of advanced science made by a successful paradigm shift from one to another. At that time, Kuhn's idea was a revolution in itself, becoming the primary method for scientific change. It became a basis for science paradigm policy shift and since, has been a model for gradual reform. Identifying and incorporating this model into the countries' scientific policy and reform is extremely important. The applicability of the used model can be judged by the outcomes resulting in the paradigm shift. By the way, not every scientific progress results in revolution. However, we would like to note that a laggard period with weak mental development is ended by an intellectual outburst. In other words, although in the 17th century, Mongols accepted Tibetan medicine within the framework of the "Four Medical Tantras" with recognition and common scientific mind, later in the 18th century, they thought beyond the box of the "Four Medical Tantras" and created the opportunity to develop a new paradigm. This shift made a valuable contribution to the establishment of, in a broader sense, Mongolian medicine and, in a narrow sense, traditional Mongolian medicine.

Keywords: Paradigm, policy, traditional medicine, science policy, shift;

INTRODUCTION

The term paradigm comes from the Greek word paradeigma, meaning "pattern, example, sample" from the verb paradeiknumi, "exhibit, represent, expose" and from para, "besides, beyond" and "to show, to point out" [1]

It entered the English vocabulary in the 15th century and then it meant an example and a model. Linguist Ferdinand de Saussure viewed paradigm as a set of elements that have the same meaning within a text.

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The Merriam-Webster Online dictionary defines this usage as “a philosophical and theoretical framework of a scientific school or discipline within which theories, laws, and generalizations and the experiments performed in support of them are formulated; broadly: a philosophical or theoretical framework of any kind” [2]. The term paradigm is frequently used in social sciences. In popular understanding, paradigm often simply means a collection of ideas, a cluster of theories, models or actions representing a guiding idea, or a conceptual framework [3].

Oxford Dictionary of Philosophy attributes the following description of the term to Thomas Kuhn's "The Structure of Scientific Revolutions":

Kuhn suggests that certain scientific works, such as John Dalton's "New System of Chemical Philosophy" [4] provide an open-ended resource: a framework of concepts, results and procedures within which subsequent work is structured. Normal science proceeds within such a framework or paradigm. A paradigm does not impose a rigid or mechanical approach, but can be taken more or less creatively and flexibly [5].

In *The Structure of Scientific Revolutions*, Kuhn saw sciences as going through alternating periods of normal science, when an existing model of reality dominates a protracted period of puzzle-solving, and revolution when the model of reality itself undergoes sudden drastic change. Paradigms have two aspects. Firstly, within normal science, the term refers to a set of exemplary experiments that are likely to be copied or emulated. Secondly, underpinning this set of exemplars are shared preconceptions, made prior to – and conditioning – the collection of evidence [6]. These preconceptions embody both hidden assumptions and elements that he describes as quasi-metaphysical [7], the interpretations of the paradigm may vary among individual scientists [8].

Kuhn presented his notion of a paradigm shift in his book "The Structure of Scientific Revolutions" (1962).

Kuhn contrasts paradigm shifts, which characterize a scientific revolution, to the activity of normal science, which he describes as scientific work done within a prevailing framework or paradigm. Paradigm shifts arise when the dominant paradigm under which normal science operates is rendered incompatible with new phenomena, facilitating the adoption of a new theory or paradigm [9]. The term "Paradigm shift" implies not only a deep change in an external state of affairs but a change of consciousness. Integrating diversity in the workplace, while it may seem straightforward, involves a paradigm shift because of the nature of racism, sexism and all other prejudices. These prejudices are ingrained in part in human psyche. As such, they affect all areas of life, especially social arenas like places of employment. A paradigm shift in the workplace would entail greater diversity. During a paradigm shift, two simultaneous changes are supposed to occur: one, the decline of the old paradigm, when the paradigm begins to fail to solve problems and explain anomalies, and two, the emergence of a new one if a new theoretical corpus allows the publication of promising results. During these changes, the hope of discoveries modifies the researchers' scientific choices who progressively abandon the traditional research fields in favor of the new set of assumptions. Therefore, we aim to explain with some examples how the paradigm shift took place in traditional Mongolian medicine in the 18th century. Also, it will clarify how Mongolian medical scientists expanded and developed the ideas of Tibetan medical scientists at that time.

MATERIALS AND METHODS

The core materials used are:

- Kuhn, T. S. (1970) *The Structure of Scientific Revolutions*. (2nd Edition) University of Chicago Press.

-Paradigms.Encyclopedia.com.

<https://www.encyclopedia.com/>

- Bold, Sh. (2013) History and Development of Traditional Mongolian Medicine (5,000 years of Medical History). Munkhiin Useg Group.

Research methods

Source study method

The source-study method includes research activities of books, literary works, sources, and papers. We made a historical study on the date and place of birth of the authors and their literary works in order of the written period starting from the earliest, thus comparing special, innovative and creative ideas in terms of content and mentality with other original literary works by using research materials in accordance with the research goal and objectives.

The comparative method

A comparison is a fundamental tool of analysis. It sharpens our powers of description and plays a central role in concept formation by bringing into focus suggestive similarities and contrasts among sources. The comparative method is where the researcher collects data about different books, scientific papers and other sources, including the paradigms and paradigm shifts, and then compares one source with another to identify what is the information in one book or paper but not another.

RESULTS AND DISCUSSION

This study consists of two main parts. First, the main features and patterns of the paradigm of traditional Mongolian medicine are clarified. Then, an analysis of the paradigm shift in traditional Mongolian medicine was conducted.

Paradigm in the traditional Mongolian medicine

In the 18th century, huge progress occurred in the intellectual sector; the explanative books of Buddhism which we called the ten sciences were translated and published. The ten sciences are divided into two fields of knowledge.

It includes five major sciences: Fine Arts, Medicine, Linguistics, Philosophy, and Inner Sciences of Buddhism, and the five minor

sciences: Synonymy, Astrology, Performance (Drama), Poetry, and Composition.

The books of ten sciences were distributed to almost every province and monastery of Mongolia. At that time, in the 18th century, a comprehensive base was created for the start of the golden period of Mongolian medical development, which was characterized by theoretical and practical compliance with the “Four Medical Tantras” of Tibet based on Ayurvedic medicine of India. Tens of medical books from this time were written in the Mongolian and Tibetan languages by Mongolian doctors and scholars alike [10]. These books revolutionized Ayurvedic and Tibetan medicine and included many new ideas and knowledge. In fact, it was a new paradigm in traditional Mongolian medicine.

The new paradigm containing progress and unique opinions can be seen such old sutras, such as the “Four Mongolian Medical Tantras” written by Sumbe Khamba Ishbaljir, and “Satisfaction for the Readers” or “Uzegsdiin Bayasgalan” by Jigmeddanzanjamts and “The Secrets of Prescription Recipes” or “Uvidasyn Dalai” by Mindol Jambal [11]. These scholars in their books reflected new concepts that were not specifically clear in the “Four Medical Tantras”, such as warm and cold diseases, which formed the basis to categorize cold and common diseases and treat them differently, and the theoretical and practical understanding of the categorization of infectious diseases. To clarify their paradigm, let's refer to some historical pages.

The history of Tibetan medicine shows that it was not a direct copy of the Indian Ayurveda. Various Tibetan schools debated and interpreted the “Four Medical Tantras” and enriched it with their own ideas. As a result of the debates and attempts to interpret from a different perspective, a unique Tibetan medicine was born. This can be called a new paradigm in medicine or a scientific revolution for the Tibetans who followed an indigenous religious tradition called Bon, and who led simple lifestyles and lacked theoretical systems [12].

What was the status of traditional Mongolian medicine in those days?

Until the 13th century, Mongols used *dom* (magical cure) treatment practice extensively.

Then from the 14th to the 16th centuries traditional Mongolian medicine was developed incorporating elements of Arabic and Chinese treatments and such medical practice was beyond the influence of any religion. At the end of the 16th century, Buddhism developed in Mongolia, and Tibetan medicine, which originated from the Indian Ayurveda medicine, was directly adopted.

Religion and the unending internal struggle among the Mongolian nobles for power, as well as the Manchu occupation of Mongolia became joint factors for the immediate adoption of Tibetan medicine. Manchurians used religion as a tool to control Mongolia. A Manchu emperor had then said, "establishment of a Buddhist monastery equals a thousand Mongol warriors." In such circumstances, Tibetan medicine, based on Ayurvedic tradition, entered into Mongolia. However, gradually, various efforts, such as the renewal of the theory of Tibetan medicine, the replacement of some medicinal ingredients with herbs growing naturally on the Mongolian soil, and the blending of some treatments with Mongolian folk healing practice of *dom* occurred. These efforts were strengthened by the intellectual scope and capability of Mongols and became the basis for the establishment of a new paradigm shift in traditional Mongolian medicine with a blend of Tibetan medicine.

Other stimuli to establish the new paradigm was the entire set of differences of the Mongols, including their unique physiological features, their diet, harsh changeable climate, lifestyle, mindset, etc. They faced the necessity to establish a theory and practice to heal the diseases that occurred due to the above-mentioned circumstances. For example, Tibetan medicine lacked certain understanding about different types of massage therapy, such as gentle rubbing, pressure giving and assembling, etc. that were effective in treating fractures, injuries and collisions, which were common occurrences in the daily lives of the Mongols.

The paradigm revolution in the traditional Mongolian medicine

In the normal field of science, paradigm is a tool for experimental examples, their replicas and models. The advantage of a paradigm is that it is the best way to approach the truth rather than the general scientific method, and it is the program scope that can be adopted for future research.

As Thomas Kuhn stated in his book "The Structure of Scientific Revolutions," revolution is an example of advanced science made by a successful paradigm shift from one to another. At that time, this idea of Kuhn was a revolution in itself and it became the core method to change ideas scientifically. This method became a basis for paradigm shift in the policy of science and has been a model for gradual reform. Discovering and incorporating this model into a country's scientific policy and reform is extremely important. To cite an example, even though the scientific field is advancing to a certain extent in developing countries, it is still required to adapt to global changes [13].

The box is the most obvious example to illustrate the nature of paradigm. For instance, paradigm is like thinking out of the box. The thought inside the box is the normal common thinking of science. If this common thinking is surrounded by a box, the outside of that box will have the same meaning as a paradigm. To put it another way, a paradigm can emerge when our mindset goes beyond the normal level of thinking and science, thus reaching a wide range of cognition behind the box wall. Thomas Kuhn called this thinking outside the box as Scientific Revolution. Mostly, attempts aimed at scientific revolution fail. Very few create a new paradigm. A wide range of changes is made in world science if a new paradigm is successfully created. Therefore, it is essential to think outside the box when finding solutions for issues in traditional Mongolian medicine.

Let's take an example. Prevention of infectious diseases is considered to be extremely important.

“gNyan rims spyi bcos pa” chapter 25 of a sutra called “Uvidasyn Dalai” (literally meaning Ocean of Magic) by Mindol Jambal (1789-1838) notes that “A disease is infected secretly, not revealed by a single condition or has a threat to infect all others. Therefore, it is important to prevent that disease”. Also, the chapter on “Smallpox” has mentioned that “one should strive to prevent as common infectious fever and smallpox have huge danger” and it had prescribed 7 preventive methods [14]. These texts grab attention and disclose interesting issues. Mindol Jambal discovered and recorded many new ideas, new methods of pharmacy and treatment besides reflecting on infectious diseases in his book “Uvidasyn Dalai.” The new ideas reformed Tibetan medicine and built the foundations for a paradigm shift in traditional Mongolian medicine, which later became a reform pattern.

“Let me cite another example. The “Four Medical Tantras” notes that there are 4 types of viruses or bacterial diseases, i.e., wind, bile, phlegm, and blood.”

“In the book, “Lkhantav” said that the diseases are caused by a type of bacteria and bacteria have a lizard-like head, which are grabbed by the hair and the bacteria enters the body through the hair pores and nostrils. Its inner parts are red, it has no legs, and it is ball-shaped, too tiny to see. It can run throughout a whole body via vessels, can coexist with blood and causes all viral diseases” [15]. In other words, it explains that bacteria from the external environment enters the human body and cause viral diseases together with internal microflora. This knowledge of Tibetan scholars was deepened in the sutra “Uvidasyn Dalai” by a Mongolian scholar Mindol Jambal who had written that “Virus is a disease contributed by heat, wind, bacteria, yellow fluid and is infected via wind, cold, smell” etc. He determined not only the channels through which a disease is passed, but also determined how a disease is caused jointly by virus, wind, heat, bacteria and yellow fluid. In

addition, he also attempted to define infectious fevers as follows:

“Infectious fevers comprises of wind fever, bile fever, phlegm fever, chronic fever, infection” and in the chapter dealing with diphtheria and anthrax, had divided them into meningitis, diphtheria, pulmonary anthrax, peptic ulcer of the stomach and duodenum, cutaneous anthrax, lymph caused cancer, cholera and abscesses. Another book called “Erdeniin Erhesiin Zuun Ankhaarliin Bichig” written in the 18th century added 4 more viral diseases and a total of viral diseases that were counted at that time numbered 15. Another textbook added 5 more diseases, bringing the total number of infectious diseases to 20. Later Mindol Jambal identified 10 new infectious diseases and recorded a total of 30 viral and infectious diseases in his book “Uvidasyn Dalai” [16]. He also noted that “The disease causes fatigue, loss of energy, sharp pain and body aches, so it is difficult to heal.” Since then, doctors of traditional Mongolian medicine have added various new ideas for treating viral, infectious and bacterial diseases. The new knowledge, which is mentioned above by the Mongolian doctor Mindol Jambal, is the result of thinking out of the box, on the other hand, it can be said that this is an example of his contribution to traditional medicine and a paradigm revolution.

CONCLUSIONS

Not every scientific progress results in revolution. However, we would like to note that a laggard period with weak mental development is ended by an intellectual outburst. In other words, although in the 17th century, Mongols accepted Tibetan medicine within the frame of “Four Medical Tantras” with recognition and a common scientific mind, later in the 18th century they thought beyond the box of the “Four Medical Tantras” and created the opportunity to develop a new paradigm. This shift made a valuable contribution to the establishment of, in a broader sense, Mongolian medicine and, in a narrow sense, traditional Mongolian medicine.

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13. Bold Sharav (2008) Paradigm. Journal of Mongolian Medical Sciences. Ulaanbaatar, №3 (145), pp. 1-2.
14. Mindol Jambal. "gso rig bstan bcos mtha' dag gi snying po rnam phyogs gcig tu bsdus pa man ngag rin chen 'byung gnas bzhugs so." 25th chapter "gNyan rims spyi bcos pa", *Wooden printing block* with Tibetan script.
15. Sdesrid Sangsrgyasr gyamtsho. "bdud rtsi snying po yan lag brgyad pa gsang pa man ngag yon tan rgyud kyi lhan thabs zug rngu'i tsha gdun sel ba'i katp'ur dus min 'chi zhags gcod pa'i ral gri shes bya ba". *Wooden printing block* with Tibetan script.
16. Bold Sharav (2013) History and Development of Traditional Mongolian Medicine (5,000 years of Medical History). Ulaanbaatar, Munkhiin Useg Group, pp. 289-290.