

Theoretical research on the epistemology of TCM from the I Ching

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Chen PJ: conceptualization, investigation, document collation, writing, reviewing, and editing.

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Abbreviations

TCM, traditional Chinese medicine

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Abstract

Background: The *I Ching*, or *the Book of Changes*, in the Han Dynasty was mainly based on symbolism and mathematics and was combined with the astronomical calendar that was popular at the time, forming a theory of hexagram Qi (the life force or vital energy, Qi is the dialectical unity of the spirit and matter of the human body and nature) as the main focus. The people of the Han Dynasty believed that the development and changes in cosmic and human society were consistent with the changes in the hexagrams. Therefore, exploring the construction of the theoretical system of medical epistemology by the philosophy of the *I Ching* will help to inherit better and develop TCM today. **Methods:** This paper mainly uses the analysis method of literature review, including famous ancient books on TCM from the Han Dynasties to the Song, Yuan, Ming, and Qing Dynasties and the cosmological concept of *Yin-Yang*, the Five Elements, and the unity of man and nature in Chinese philosophy. **Results:** This article provides a new explanation of the theory of *I Ching* in the Han Dynasty on the thinking mode of the epistemology of TCM from three aspects: (1) The "unchangeable" theoretical basis of image-numerical thinking; (2) The "simple" way of life with one *Yin* and one *Yang*; and (3) The "cosmology" view of the evolution of life. **Conclusion:** This shows that TCM, at its inception in the Han Dynasty, consciously used a rational thinking attitude to construct a harmonious and unified cosmic view of life in which heaven, earth, and man are of the same origin and holographic structure. This philosophy of life is that humanity is the comprehensive embodiment and development of the Way of Heaven. It is also the field where TCM, as an original life science, makes fundamental contributions to human health today. However, the specific historical limitations, such as the Han Dynasty's reliance on cosmological analogies, may lack empirical rigor compared to modern scientific standards. Also, TCM's subjective interpretations can limit precision. Therefore, integrating TCM's unique wisdom with modern science methodologies can advance its global relevance in the future.

Keywords: epistemology; cosmology; TCM history; I Ching; evolution

Introduction

The *I Ching*, or *The Book of Changes*, in the Han Dynasty was mainly based on image mathematics and combined with the popular astronomy and calendar at that time. It formed a systematic theory of the unity of heaven, earth, and man, with the theory of hexagram Qi as the main theme—the mutual induction between heaven and man and the universe, and the unity of heaven and man. The people of the Han Dynasty believed that the development and changes in natural phenomena and human society were consistent with the changing rhythm of the hexagrams. The Eight Trigrams was a holographic miniature of the structure of the universe. Astronomy, geography, the calendar, the four seasons, solar terms, music, etc., were all connected with the hexagrams. Even the changes in human society could be expressed by the Eight Trigrams. Therefore, by mastering the changing patterns of the Eight Trigrams, the Han people could, on the one hand, judge the order or chaos of a country, on the other hand, determine an individual's fortune or misfortune [1]. Recent years have seen considerable attention paid to the methodology of philosophy. The puzzle is simple—if philosophy is not an empirical discipline, how can one philosophical theory be rationally preferred over another? One answer to this question is that we should apply the theoretical virtues. Foremost among these theoretical virtues is simplicity—so perhaps we should prefer simpler philosophical theories to more complex ones [2]. This simple philosophical way of thinking has formed a humanistic medical system of TCM that integrates the universe, nature, and human society.

The image-number model created by the people of the Han Dynasty with cosmology as the background, on the one hand, is a dynamic reflection of the external objective physical universe (natural phenomena) and social life. On the other hand, it is a subjective expression of psychological factors, such as human cultural mentality and emotions. Moreover, this cultural psychology itself is the personification of the world [3]. People in the Han Dynasty were obsessed with the beauty of the cosmic order contained in the symbols and numbers of the *I Ching*. In their worldview, the entire universe is not simply a mechanical, physical operation but a life universe that is endless and infinite. This is a harmonious, vibrant, infinitely beautiful life universe that integrates natural phenomena and humanistic emotions. Every small life in it can breathe freely and share the same fate with the great life of the universe and together create a future with infinite beauty.

There is a paradox in the standard model of cosmology. How can matter in the early universe have been in thermal equilibrium, indicating maximum entropy? However, the initial state also has low entropy (the “past hypothesis”) to underpin the second law of thermodynamics. The problem has been highly contested, with the only consensus being that gravity plays a role in the story, but the exact mechanism is undecided [4]. Just as many physiological and biochemical mechanisms of Chinese medicine are still unclear, in order to grasp the theoretical essence of TCM's way of thinking, we must stand at the commanding heights of its development and deeply reflect on its cultural background and theoretical roots. The present paper analyses some of the values determining the reception of TCM in the West, and it demonstrates how the cognitive aesthetics of European culture and Western science have influenced the selection of specific concepts from a heterogeneous pool of traditional Chinese conceptual systems of healthcare by Western authors in recent years. A comparison of different approaches to health care in traditional Chinese, as well as traditional European and modern Western medicine, suggests that the differences between Chinese and Western medicine may not be as clear-cut as they have been portrayed in the Western secondary literature of the past years. One of the more fundamental dividing lines is the handling of cognitive disagreements and, possibly related to this, the ubiquitous phenomenon of patterned knowledge in Chinese medicine and culture [5]. Therefore, based on the unique cultural background of TCM, we can rebuild a bridge connecting heaven, earth, and man and deeply understand the grand and profound ideal state of life in the universe today.

Related articles on TCM epistemology attempt to reconstruct TCM theory by (a) providing explanations of TCM entities as abstractions and constructs that relate to observable body functions and illness symptoms. Moreover, (b) interpreting TCM theory as comprising heuristic models that were constructed from clinical experience to fit empirical observations of illnesses and their treatments with herbal medications and acupuncture. Scientists should be less concerned with the ontological status of TCM entities and the epistemic credentials of TCM models than with the ability of these concepts and models to guide physicians in therapy [6]. Another article argues that in spite of the common belief that Chinese natural philosophy and medicine have a unique frame of reference completely foreign to the West, they have significant cognitive and epistemic similarities with certain esoteric health beliefs of pre-Christian Europe. From the standpoint of cognitive science, Chinese medicine appears as a proto-scientific system of health observances and practices based on a symptomological classification of disease using two elementary dynamical-processes pattern categorization schemas: a hierarchical and combinatorial inhibiting–activating model (*Yin-Yang*) and a non-hierarchical-and-associative five-parameter semantic network (5-Elements/Agents) [7]. In addition, some articles offer a fresh perspective by examining the Great Commentary's dao-xiang-qi cosmology. “Dao-Xiang-qi” stands for abstract principles, emergent manifestations, and concrete objects, respectively, and this triadic conception of reality leads to an analysis of the human body from a holistic, process-oriented epistemology. The interpretations of reality being contained in the *Yi Jing* were developed by careful and detailed observation over time and have deeply influenced China's philosophical and scientific traditions, including medicine. The effect of the dao-xiang-qi (way-image-vessel) triad on Chinese medicine has led to its characteristic dao-xiang epistemic: investigations of human health and illness focus on the living body and result in a more functional or process-oriented epistemic [8].

Based on the above analysis, there are few articles specifically on the *I Ching* and TCM epistemology. Therefore, this article tries to explain the theory of *I Ching* in the Han Dynasty on the thinking mode of the epistemology of TCM from the following three aspects (Table 1).

The “Unchangeable” theory of Image-Numerical Thinking

From a theoretical perspective, the study of the sequence of divination (The Image and Number of the *I Ching*), which refers to a method of divination using the *I Ching* that involves studying the Yao (symbols) and Shu (numbers) to interpret the changing meanings of various combinations. It is a system based on ancient Chinese philosophy and cosmology. It is also the product of the combination of the natural philosophy science of the Han Dynasty and the theory of the *I Ching*. This connection between science and *I Ching* made *I Ching* begin to develop scientifically and rationally, increasing the epistemological significance of symbolic and numerical deduction and making it a natural philosophy in ancient China [9]. The construction of this theoretical model of symbolic thinking provides a simple and logical illustration for life's understanding of the universe. The way of thinking about the Three Elements of heaven, earth, and man laid the theoretical foundation for the development of Chinese medicine in later generations. This mindset reflects the ancient Chinese people's persistent exploration and infinite yearning for the view of the Way of Heaven based on the “Six Laws” of the *I Ching*.

In TCM, it developed into a medical theory system based on the “Six Classics Dialectics” in *Shang Hanlun* (*Treatise on Cold Damage*). In the Han Dynasty, which was dominated by Confucian classics, the “Six Arts” of poetry, calligraphy, rites, music, *I Ching*, and Spring and Autumn Annals were the main body of Confucian classics. Ma Yifu, a contemporary master of Chinese studies, firmly believes that the Six Arts is an original and authentic world of meaning and that the Six Arts are the perfect teaching in human thought. All thoughts and academics of humanity in China and the West can be included in the Six Arts [10]. In a nutshell, it is a comprehensive manifestation of the Way of Heaven over the way of man, just as Dong Zhongshu of the

Western Han Dynasty said: “The Great Way originates from Heaven; as Heaven remains constant, so does the Way” [11].

Taoism has really integrated the spirits of the Six Heavens into its system, as we have seen in a number of Taoist scriptures. In the *Taishang Dongguan ling bao bending yuan jing (The Greatest Mysterious and Spiritual Treasure Sutra)*, it says: “There are degrees among immortals as among deities. The Six Heavens were the great king of demons of the three worlds who commanded the spirits of the Six Heavens. The great king of demons follows all deities of the most high. If Taoists attain their ultimate objective, the great king of demons will also be promoted” [12]. The *Huangdi Neijing Taisu (Grand Simplicity of Inner Canon of Huangdi)*, written by Yang Shangshan, a Taoist physician in the early Tang Dynasty, embodies the main characteristics of the connection between TCM and *I Ching* in terms of “the cosmic view of the unity of man and nature, the changing way of thinking and the symbolic and numerical thinking model.” The title of the book *Tai Su* is taken from *Yi Wei Qian Zao Du (Opening the Laws of the Hexagrams Qian and Kun)*, which has a cosmological view that “The tangible originates from the intangible; where do Heaven and Earth come from? Hence, it is said there are *Taiyi (Prebiotic)*, *Taichu (The beginning of time)*, *Tai Shi (In the Beginning)*, and *Taixu (The void)*...*Taixu* is the beginning of matter” [13]. In addition, Yang Shangshan also introduced the “Twelve News Hexagrams” of Meng Xi and Jing Fang’s *I Ching* theory in the Western Han Dynasty to explain the rise and fall and transformation mechanism of *Yin* and *Yang* in nature and combined with the theory of three *Yin* and three *Yang* to explain the pathogenesis. Yang Shangshan’s annotations of *Huangdi Neijing Taisu* are the first to comprehensively and classifiedly annotate *Huangdi Neijing (Yellow Emperor’s Inner Canon)*. Yang’s annotations are mostly based on traditional Chinese philological classics and follow the method of Han confucian annotating classics. He extensively explores the origins of the naming of acupoints, meridians, and diseases in TCM and accurately explains the philological interpretation of names and objects by explaining medical principles. Yang’s exegesis of names and objects is rich in content, laying a foundation for later generations to accurately understand the meanings of disease names, meridians, and acupoints and to further enrich the principles and methods of exegesis of names and objects [14].

During the Song, Jin, and Yuan dynasties, medical practitioners began to develop different academic schools, but they all drew their theoretical ideas from the *I Ching*. For example, Li Dongyuan was a famous medical scientist in the Jin and Yuan dynasties of China. His book *Treatise on the Spleen and Stomach (Theory of Spleen and Stomach: The Principle of Life and Death of Yin and Yang in Heaven and Earth, in the Rise and Fall)*, he mentioned in the article: “The year begins with spring; the first month is upright, signifying the start of all things; the hour of *Yin* (3-5 AM) leads and initiates growth. The young yang energy rises from the Earth, guiding the ascension of *Yin*, and pervades the heavens, the earth, and humankind” [15]. The assignment of spring, tiger, and Shaoyang is completely consistent with the theory of hexagram *Qi* in *I Ching* in the Han Dynasty. In traditional medical science cognition, the Five Movements and Six *Qi* are the important meteorological factors affecting the occurrence of epidemics. An analysis of Li Dongyuan’s academic thoughts from the perspective of the Five Movements and Six *Qi* reveals that the abnormal weather conditions of wind, fire, and dryness in the year of Renxu led to the plague, which in turn contributed to the creation of *Pu Ji Xiao Du Yin (Universal Relief Toxin-Removing Beverage)*; the gasification state of cold and dampness in the year of Renchen formed the cognitive basis of spleen and stomach deficiency is the beginning of all diseases; the nature of the Renchen epidemic, cold disease turns into heat in the middle is consistent with the gasification state of *Yin* fire. This verifies the important influence of the Five Elements and Six *Qi* on Li Dongyuan’s academic thoughts [16]. Although there are many methodological shortcomings in the current literature and the value of FCSQ (five circuits refer to wood, fire, Earth, metal, and water; six *qi* indicate wind, cold, summer heat, dampness, dryness, fire) theory cannot be fully affirmed, its application value in clinical

practice is undeniable. The present study provides a reference for the clinical application of FCSQ theory in TCM in the future [17].

Zhu Danxi, a famous medical scientist in the Yuan Dynasty, in *Gezhi Yulun (Treatise on Inquiring the Properties of Things)* uses the human heart and kidneys to metaphorically represent the water and fire in nature and the hexagrams of Kan and Li [18]. He says: “In the human body, the heart is like fire located above, and the kidneys are like water located below. Water can rise to nourish, and fire can descend to warm. The cycle of rising and falling never stops, and thus life can continue.” This theory of the rise and fall of the heart and kidney in the human body is the same as Xun Shuang’s theory of neutralization in the Eastern Han Dynasty, in which Qian rises and Kun descends to form the *Ji-Ji* hexagram. Zhu Danxi proposed the propositions that “*Yang* is frequently in excess while *Yin* is often in deficiency” and “Uncontrolled physiological fire consumes genuine *Yin*”. The main connotation of the *Yin*-nourishing thought has been established. From the initial advocacy of Danxi’s health-preserving theory of “nourishing *Yin*” and nourishing blood by eating light food and keeping calm, his disciples elaborated and developed the knowledge on the pathogenesis of *Yin* deficiency and hyperactivity of fire. Therefore, different *Yin*-nourishing treatments targeting qi, blood, essence, and kidney yin have been sorted out and expanded in clinical practice. In the Ming Dynasty, the theory of warming and nourishing was developed to correct the theory of lowering fire and nourishing *Yin*, advocating for the true *Yin* and valid *Yang* in the kidneys. Other doctors in the Ming Dynasty supplemented and developed the treatment of *Yin* deficiency syndromes, such as spleen *Yin* and lung *Yin*, relieving dryness and suppressing *Yang*. By the Qing Dynasty, the Warm Disease School had enacted laws to save body fluids and preserve *Yin*. The TCM community had experienced a change in its perspective on the proposition of “*Yin* deficiency” in the human body, and the understanding and treatment of concepts such as “*Yin* deficiency” and “*Yin* deficiency and fire excess” had also been continuously deepened and refined. The theory of nourishing *Yin* was gradually improved amidst the debate [19].

The *Mingmen (Gate of Life)* theory developed during the Ming and Qing dynasties was based on the *I Ching* cosmology of “The *Taiji (Tai Chi)* generates the the *Two Polarities* (heaven and earth), the *Two Polarities* generate the *Four Manifestations* (Azure Dragon, White Tiger, Vermilion Bird, Black Tortoise), and the *Four Manifestations* generate the *Eight Trigrams* (The Eight Trigrams are a fundamental concept in Chinese philosophy).” Among them, the medical thought of the famous doctor Huang Yuanyu mainly absorbed the medical theories about the natural creation of all things in the *I Ching*, *Tao Te Ching*, *Hetu (Yellow River Map)*, and *Zhouyi Cantongqi (The Seal of the Unity of the Three)*, etc., emphasizing that the central *Qi* is the foundation of the body, and based on “The balance of vital energy, holistic and integrative thinking.” It has the same effect as the alchemy theory of “The trigrams of Kan and Li define the boundaries, while the wheel turns the axle straight.” by Wei Boyang, a Taoist alchemist in the late Eastern Han Dynasty. Modern scientific research to explore the pathogenesis and treatment of diabetic gastroparesis (DGP) is based on Huang Yuanyu’s theory that “one fundamental energy circulates, the earth’s core forms the four symbolic images.” It is believed that the pathogenesis of DGP can be summarized into six stages: “centre deficiency-earth dampness-wood stagnation-metal dryness-water coldness-collateral stasis.” The treatment should focus on strengthening and mediating the center of Earth and grasp the dynamic changes of the four elements of wood, fire, metal, and water. According to the pathogenesis evolution at different stages, focus on the methods of supporting *Yang* and suppressing *Yin*, soothing the liver and regulating qi, raising *Yang* and restraining the lungs, clearing the upper and warming the lower, dispersing blood stasis and unblocking collaterals, calming the mind, so that the *Qi* can rise and fall in an orderly manner and circulate continuously [20]. In conclusion, the source of its basic thinking lies in the picture of the Universe between Heaven and man constructed in the *I Ching* and in the cultural background of the unity of Heaven and man that developed and flourished during the Han Dynasty.

When Ban Gu of the Han Dynasty wrote the *Book of Han: (Treatise on Measures and Calendars)*, he linked the mathematical universe view of “six heavens and five earths” with the operation of the heavenly way. It is said: “Heaven is six and Earth is five, these are the constants of numbers. Heaven has six qi, which produces five flavors. The union of five and six is the combination of heaven and earth, and it is the basis for the survival of the people. Therefore, there are six solar stems, five forks in the morning, eleven represents the law of Heaven and Earth is fulfilled, and the words end and begin again” [21]. The saying highlights the importance of numbers in understanding the natural world and the harmony between heaven and earth. Therefore, the medical numerology of the number of Heaven is six, and the number of Earth is five was popular in the Han Dynasty. Under the guidance of this numerology, TCM not only established the early eleven meridian system but also constructed the theory of the five viscera and six bowels, the five elements, and six Qi [22]. Therefore, I propose the natural laws of “six laws and five elements” of the Way of Heaven, which are internalized in human Life as the moral laws of “five natures and six emotions.” Specifically, in terms of the body, they are the structural laws of “five viscera and six bowels.” This is the view that humanity is the comprehensive embodiment and development of the Way of Heaven. This symbolic and numerical view of life that is the same as that of heaven and man is still worthy of continuous exploration and questioning in the field of life science today.

In this way, life and the natural world have a synchronized rhythm of operation. “All life, both internal and external, should be united and harmonious with the heavens.” Heaven and man jointly compose a harmonious symphony of cosmic life. In the new era, inheriting and innovating TCM urgently requires expounding on the traditional Chinese concepts of calendar, time, and space in order to carry forward the worldview and methodology of the ancient philosophers. The elaboration of traditional concepts of calendar, time and space, and philosophical thoughts will also support the inheritance and development of Chinese medicine in the new era [23].

Since the Western Han Dynasty Confucian scholar Dong Zhongshu put forward the view that “The heavens do not change, and the Way remains constant,” it has profoundly influenced the development of Chinese academic thought for thousands of years. The term “Heavenly Way” has a rich meaning. Its basis is the laws of physics; faith and justice are the inherent laws of the Heavenly Way. Therefore, as the natural constant and the heavenly principle, “Heavenly Way” is above the laws of physics and also means the law of eternity [24]. The Han people’s understanding of the Way of Heaven was also deeply rooted in their understanding of the cyclical movement of celestial phenomena. They further inferred the Way of Heaven to explain human affairs and used *I Ching’s* symbolic and numerical thinking method to refer to all natural phenomena to explore the inner mysteries of life analogously. Under the guidance of the grand unified cosmological concept of the unity of man and Nature, centered on the *I Ching*, people in the Han Dynasty constructed a theoretical system of TCM centered on the *Huangdi Neijing*.

The analogical thinking method of *I Ching* is to reason based on the principle of induction. In modern philosophy of science, the principle of induction must be interpreted as a pragmatic or operational maxim [25]. “Principle” refers to the nature and essence of objective things and the laws of the internal connections between them. Things of the same kind have the same properties, essential characteristics, or common laws of connection. Therefore, the essence of inference is the deduction of reason [26]. This way of thinking is consistent with modern science’s understanding of life. Zhu Xi, a famous Neo-Confucianist in the Song Dynasty, in *Zhou Yi Ben Yi (The Original Meaning of the Book of Changes)* said: “Divided in principle and there are myriad differences; unified in the Way of the *Tao*, there is no distinction” [27]. Modern science has taken the path of scattered in reason, so relative truths are increasing, while absolute truths are becoming increasingly vague [28]. This view of scientific truth is worthy of reflection and vigilance by our modern scholars.

Over the last thirty years, a new systemic understanding of life has emerged at the forefront of science. It integrates four dimensions of

life: the biological, the cognitive, the social, and the ecological dimension. At the core of this new understanding, we find a fundamental change of metaphors: from seeing the world as a machine to understanding it as a network. One of the most radical philosophical implications of the systems view of life is a new conception of mind and consciousness, which, for the first time, overcomes the Cartesian division between mind and matter [29]. As the great scientist Albert Einstein once said: “From the point of view of systematic theory, we can conceive of the development of empirical science as a continuous process of induction. People have developed various theories that express statements about a large number of individual observations on a small scale in the form of empirical laws. By comparing these empirical laws, they can explore universal laws. In this light, the development of science is a bit like compiling a catalogue. It seems to be a purely experiential business. However, this view misses the whole actual process, for it ignores the important role that intuition and deductive thinking play in the development of exact science. Once science has emerged from its primitive stage, the process of arrangement alone can no longer make theoretical progress” [30]. The intuition and deductive thinking in symbolic and numerical thinking are exactly the “unchanging” Way of TCM and the inexhaustible source of creativity in encountering certain life environment.

Modern neo-Confucian philosopher Tang Junyi pointed out that the *I Ching* emphasizes that people should cultivate virtue through interaction with objects. Human beings are born from the harmony of heaven and earth, so they inherently possess the virtues bestowed by heaven and earth. They can cultivate their virtues at any time and in any place according to the various virtues of nature. Thus, they can observe the humanities and transform the world in the process of observing the changes of time by observing astronomy [31]. Through *I Ching’s* symbolic and numerical thinking, we can grasp the transcendent sensory intuition of the metaphysical *Tao* (astronomy) contained in this natural world and then inject it into the physical vessel of life itself (humanities). Through the interaction of life itself and the Way of Heaven and Earth, the two-way harmonious development of nature and humanity can be achieved.

Over the past hundred years, those who have tried to use reduction analysis to make TCM theory “scientific,” “modernized,” and “keep pace with the times” have put in a lot of “real effort” but have not succeeded. They should calm down and think carefully about the deep-seated reasons behind it [32]. That is, the theoretical system of TCM, which is based on the symbolic and numerical thinking of the *I Ching*, is a simulation and inheritance of the Way of Heaven. This metaphysical Way of Heaven is the absolute, transcendent, eternal, true, and beautiful way that will last forever. This view can be understood from two perspectives. One is to derive the construction of an ordered ethical society from the invariability of space. The other is to further demonstrate the invariability of the universe and human hearts from an ontological perspective at the philosophical level [33]. As the Southern Song Dynasty Confucian philosopher Lu Jiuyuan said, “The universe is my mind, my mind is the universe.” This is the idea of cosmic holography. The holographic principle asserts that its origin must lie in the number of fundamental degrees of freedom involved in a unified description of spacetime and matter. It must be manifest in an underlying quantum theory of gravity [34]. This is a new cognitive science of Life and the Universe.

Whitehead’s philosophy, like other Western frameworks such as modern physics, focuses on understanding the fundamental “stuff” of the universe; *Yijing’s* cosmology of change shifts attention to human action within this unpredictable world. The role of symbolic representation, divination, and moral choice in *Yijing’s* guidance on how one perceives, lives, and acts within this ever-unfolding universe, thereby encompassing not just cosmology but also epistemology and ethics [35]. As *Yijing: Xici (The I Ching: Commentary on the Text)* said, “Seeing leads to the understanding of the image, and form leads to the understanding of the object” [36]. Ju Xi proposed the theory of metaphysics for this purpose, believing that “image” is not an “instrument” nor “*Tao*” but something in between “*Tao*” and

“instrument.” The abstract form of the Image is a divinatory symbol, so the form within is called a divinatory symbol [37]. As the heart of heaven and earth, man is the manifestation of the changes and mutual generation of the sixty-four hexagrams in different times and spaces of the universe’s great life. Under the guidance of the theory of *I Ching*’s symbolic and numerical thinking, the people of the Han Dynasty

regarded “cosmology-worldview-life values” as an indivisible unity. Through this, they deduced upward layer by layer, giving every life the supreme, sacred, and inviolable mission of heaven. As a result, the small individuals living in it have an unavoidable sense of responsibility and commitment to the great life of the universe, which is a deeper respect and understanding of the life of the universe.

Table 1 The epistemology of TCM from the *I Ching*

The epistemology of TCM	Main content
1. The “unchangeable” theoretical basis of image-numerical thinking	In TCM, it developed into a medical theory system based on the “Six Classics Dialectics” in <i>Shang Hanlun (Treatise on Cold Damage)</i> . The natural laws of “six laws and five elements” of the Way of Heaven are internalized in human life as the moral laws of “five natures and six emotions.” In terms of the body, they are the structural laws of “five viscera and six bowels.”
2. The “simple” way of life with one <i>Yin</i> and one <i>Yang</i>	The interplay of <i>Yin</i> and <i>Yang</i> is called the <i>Tao</i> . The <i>Yin</i> and <i>Yang</i> are the laws of heaven and earth, the fundamental principles of all things, the parents of changes, the origin of life and death, the repository of the divine, and the essence in treating diseases must seek the root.
3. The “cosmology” view of the evolution of life	The <i>Huangdi Neijing</i> view of life evolution of harmony between man and nature, which pursues the health of individual life to achieve overall balance and harmony between man and cosmos and man and society.

The “Simple” way of life with One *Yin* and One *Yang*

Mou Zongsan, a modern and contemporary neo-Confucian philosopher, believes that: “The *I Ching* in simplicity and ease refers to ‘Kan knows the beginning’, which embodies the creative principles of *Qian Yuan* (the Creative Principle); the ‘Jian’ in simplicity and ease refers to ‘Kun creates things’, which embodies the finality and completion principles of *Kun Yuan* (the Generation Principle). The most fundamental origin of the universe and human beings is the purest and simplest. Moreover, because this is the most fundamental level, simplicity is where the power of life creation is the strongest” [38]. This cognitive model of the “simple” way of life is the same as what is said in *Huangdi Neijing*: The view of life that the coalescence of the celestial and terrestrial *Qi* gives rise to what we call humans” [39]. It also laid the foundation for the simple treatment principle of TCM: “Only when *Yin* is at peacetime, and *Yang* is compact can essence-spirit be normal.”

In the Han Dynasty people’s worldview, the entire world is a simple diagram composed of hexagrams. As a basic thinking model of the cosmic order and its movement, the Primordial Eight Trigrams orientation diagram conveys the beauty of symmetry and balance of the objective cosmic order in eternal movement. The Postnatal Eight Trigrams is a temporal pattern of the growth and decline, birth and death of all beings, and is the embodiment of the cosmic order in the growth chain of all beings at all times [3]. The substance and function originate from one source, and there is no gap at the finest microscopic level. (Ti-Yong) This concept often appears in Chinese philosophy, particularly in the context of the interconnection between essence and manifestation, form and function. To follow the laws of Nature to understand human affairs, they jointly create a truly pure, free, and beautiful universe of life in which “The interplay of *Yin* and *Yang* is called the *Tao*; what completes it is nature; what succeeds it is goodness”.

In the fourteenth century, William Occam, in the course of his attack on the medieval scholastic philosophy, enunciated his famous

“razor”: *Entia non sunt multiplicanda praeter necessitatem* (hypotheses should not be multiplied unnecessarily). This is the classic claim for the description of nature in terms of the minimum possible number of fundamental concepts. It was presumably so recognized by Newton in the third book of his “*Principia*” in 1687 when he wrote: “We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances. To this purpose, the philosophers say that nature does nothing in vain, and more is in vain when less will serve; for nature is pleased with simplicity and affects not the pomp of superfluous causes” [39]. The simplicity of *I Ching*, Medical practitioners in later generations also often used the “balance of *Yin* and *Yang*” as a standard model to judge whether a person is healthy or not. Through the simple origin of life, we can extend it to all beings in the world. Just as *Suwen:Yin Yang Ying Xiang Da Lun (Great Theory on Yin-Yang Corresponding to Natur)* said: “The *Yin* and *Yang* are the laws of heaven and earth, the fundamental principles of all things, the parents of changes, the origin of life and death, the repository of the divine, and the essence in treating diseases must seek the root” [40]. Zhang Jingyue, a physician in the Ming Dynasty, also said: “If you want to understand the *I Ching* and TCM, you only need to understand the principles of *Yin* and *Yang*” [41]. The source of this thought lies in the heaven-man cosmic diagram of “one *Yin* and one *Yang* is the *Tao*,” which was created by the *Yi Zhuan (Ten Wings)* and gradually expanded through the Han Dynasty’s Image and number *I Ching* learning, integrating nature and humanity into one, “the principles of the world are obtained through the simplicity of *I Ching*,” and “one *Yin* and one *Yang* is the *Tao*.”

The “cosmology” view of the evolution of life

Cosmology is a mythical account of the universe as it presents itself to the human mind; it needs to be poetic, symbolic, and inspiring with a sense of awe and mystery. Furthermore, a complete cosmology should include the three levels of macro-, meso- and micro-cosm in order to understand the nature of the universe, human society, and the

individual's relation to them. Traditional cosmologies described an eternal underlying structure to ultimate reality—a static ideal state towards which the world ought to gravitate. However, modern life is characterized by rapid growth, novelty, destruction, and fluidity of all kinds of structures, a feature that traditional static cosmologies interpret negatively and pessimistically. A modern cosmology, therefore, needs to be focused on underlying dynamic processes instead of structure and stasis. Biologists are better placed than many to appreciate a cosmology based on evolutionary change because this is the mainstream understanding of adaptation and diversity in the natural world. The same dynamic, neophilic, and open-ended process of “creative destruction” can be seen at work in science, economics, and modern spirituality [42].

In the cosmology of Chinese philosophy, change is the eternal law of the universe. According to the Confucian view of life and death, embrace harmony at the beginning and find peace at the end. The entire existence of life is a natural process of successive growth, bending and stretching, advancing and retreating, and interdependence of hidden and revealed transcendent cosmic order, *Yin* and *Yang* [31]. This ever-lasting and ever-advancing flow of life is absolute goodness and absolute beauty. Its ultimate ideal state of development is the *Doctrine of the Mean* in *Liji (The Book of Rites)* statement, “By attaining the state of harmony and moderation, the positions of heaven and earth are established, and all things are nurtured and flourish,” is the state of heaven's virtue prevailing [43].

Most cosmological models of the development of the universe are based on a purely physical approach, which considers the universe as a watch-like mechanism that provides the background for the phenomenon of man. A religious tradition considers the universe as centered around man as a creature of God and the universe as a “house” for man that must be kept in order. The way that this house is kept in order is different in each model: scientific morality is the driving force for extensive exploration of the cosmos; religious morality attempts an interior exploration of the Cosmos as a spirit [44]. Recent work transcribing viral DNA of bacteriophages reveals an active horizontal transfer of genes through a vector that doesn't itself benefit from the genes. Thus, the cometary biosphere is capable of transporting genes throughout the galaxy that are not themselves expressed in space, suggesting that evolution may occur not just in time but in space as well, making the earth and its history less significant for a cosmological theory of evolution. That is, evolution is driven not by innovation but by communication, albeit at a slow cometary speed, and the transfer of a life ecosystem through a low-bitrate channel can be modeled as a bootstrap process. Thus, cometary evolution suggests that the history of earth represents the spatial relativity of a bootstrap process at the speed of life [45].

This is the same as the *Huangdi Neijing* philosophy of life evolution of harmony between man and nature, which pursues the health of individual life to achieve holographic balance and harmony between man and cosmos and man and society. In order to achieve this ideal goal, humans must follow the laws of *Yin* and *Yang*, harmonize with the principles of geomancy, consume food and drink moderately, maintain regular daily routines, and not indulge in excessive labor, thus enabling their bodies and spirits to be in great harmony. Respect the laws and order of man and cosmology, man and society, and then realize harmony between man and society, harmony between man and man, harmony between man's mind and body, and harmony between form and spirit, finally achieve the ideal ecological realm of harmony between “Cosmos-Man-Society-Body-Mind-Spirit” [46].

This development concept of “unchanging” and “changing” embodies the multidisciplinary nature of TCM, which combines philosophy and life science. Although modern medicine has grown and developed along with the rapid development of Western science and technology, it is also increasingly facing a survival crisis as it moves towards “instrumentalization”. How TCM can create a new scientific paradigm with the help of the philosophical, theoretical system of “unchangeability” has become one of the difficult problems in the field of life sciences in the 21st century. The modernization of TCM is to absorb things from ancient and modern times, both at home

and abroad, to integrate them, to take the best of each, rather than to add them together. Integration means to be at a higher level than what is added together, that is, to discard and produce something of a higher level [47]. For this reason, Qian Xuesen proposed that the theoretical system of TCM is a system: “Incorporate TCM into the system of science and technology and create a new science about human beings, which is called system science. Once such science is established, it will inevitably improve and transform the existing scientific and technological system. Of course, this step should be thorough. It is not only to summarize the phenomenon and know what is natural, but also to be able to explain why it is so. This is the real modernization of TCM, which is to transform the entire scientific and technological system and create a new scientific and technological system, so it is a scientific revolution” [48].

Experimental results in epigenetics and related fields of biological research show that the Modern Synthesis (neo-Darwinist) theory of evolution requires either extension or replacement. In the case of the central concept of the gene, the definition has moved from describing a necessary cause (defined in terms of the inheritable phenotype itself) to an empirically testable hypothesis (in terms of causation by DNA sequences). Neo-Darwinism also privileges genes in causation, whereas in multi-way networks of interactions, there can be no privileged cause. An alternative conceptual framework is proposed that avoids these problems and is more favorable to an integrated systems view of evolution [49]. Therefore, a new scientific cognitive model is needed for the evolution of cosmic life.

Contemporary Chinese philosopher Chen Lai said: “The most basic assumption of Chinese philosophy is that the universe has its universal principles, that is, laws or rules. Postmodern thought can ignore universal laws, but the universe, and natural laws still exist and play their role, regardless of human will” [50]. This is an absolute hidden in the relative, a relative that changes in the absolute. Just as the Ming Dynasty physician Zhang Jiebin said: “The *I Ching*, every word and character, contains the guide for TCM; each image and line implies a respect for life” [43]. The two propositions “The great virtue of heaven and earth is life” and “The continuous generation and transformation is what we call ‘change’ in the *I Ching* in *Xici Zhuan (Appended Remarks)* are direct declarations of the objective principles and value principles of the dualistic cosmology of Heaven and Earth or *Yin* and *Yang* [51].

When we look at today's era is an era of instrumental rationality hegemony. Pandemics, biotechnology, gene editing, organ transplantation, climate change, nuclear war, AI, and “long-tail” risks such as asteroid impact. Life reacts back on itself through its creations and is constantly alienated and objectified by them, becoming a true prisoner “dancing in shackles”. The distance from and forgetfulness of the authentic homeland is the adverse consequence brought about by its legacy. This blind worship of scientific rationalism while neglecting the development path of the humanistic spirit is not only not conducive to the future development of TCM but has instead caused a crisis of survival for it to become “instrumentalized gradually”. The gradual decline of TCM in modern times occurred along with the overall decline of Chinese traditional culture. TCM is an applied discipline attached to the mother of Chinese traditional culture. If the mother is weak, the child will be affected, and the revitalization of TCM we are talking about today will also help revitalize Chinese traditional culture, and the child will be strong enough to support the mother [32]. The humanistic care contained in TCM and the value orientation of Chinese civilization have the same cosmology. Therefore, in today's era, it is necessary and feasible to use TCM culture to promote the revival of China's excellent traditional culture and understand the role of life in the universe and the direction of its evolution.

Discussion and conclusion

Epistemology, understood as a collective psychological state of consciousness, determines the kind of ethics that will be chosen. The essence of the “Anthropical Cosmological Principle” can be expressed

by the following theorem: For humankind to exist, it is necessary and sufficient for the universe to be as it is. The sufficient aspect of this theorem requires not only the biological aspects of human existence but also the spiritual roots of its being. The spiritual aspects of human existence consist of thinking about the life ahead and creating the living world [51]. The traditional medical epistemology, resting on a biomedical paradigmatic monopoly, fails to display an adequate representation of medical knowledge. Clinical knowledge, including the complexities of human interaction, is not available for inquiry by means of biomedical approaches and, consequently, is denied legitimacy within a scientific context [52]. The combination of biomedicine and traditional and complementary medicine is often referred to as integrative medicine. However, the degree to which the medical disciplines are integrated varies between medical settings, and it is believed by some to be impossible due to epistemological and paradigmatic differences [53]. Therefore, by basing ourselves on the multidisciplinary holistic Chinese medicine guided by the philosophy of “harmony between man and nature,” which is based on the concept of “heaven and earth and man are three elements,” can we better cope with the challenges and impacts brought about by the rapid development of modern science and technology. In this way, while integrating into it and benefiting the people, we will not lose our own theoretical characteristics and spiritual home. Just as the national medical master Lu Guangxin said, The future development trend of medicine is holistic health medicine. TCM has established a systematic holistic health medicine since its birth in the Han Dynasty. TCM is a health cosmic-ecological wisdom discipline that “studies the relationship between nature and man, understands the changes between health and disease, follows the way of life, and seeks the harmony of nature and man.” This is the field where TCM, as an original science, makes fundamental contributions to human health today [54].

Previous research explores *Yi Jing's* influence on medical epidemics and the influence of dao-xiang-qi on Chinese medical investigations and methodologies [8]. This article provides a new explanation of the theory of *I Ching* in the Han Dynasty on the thinking mode of the epistemology of TCM from three aspects: (1) The “unchangeable” theoretical basis of image-numerical thinking; (2) The “simple” way of life with one *Yin* and one *Yang*; and (3) The “cosmology” view of the evolution of life. This shows that TCM, at its inception, consciously used a rational thinking attitude to construct a harmonious and unified cosmic view of life in which heaven, earth, and man are of the same origin and structure. This is a humanistic and rational spirit that has the same precocious characteristics as Chinese culture. It is also the “medical vein” and endless driving force of TCM that cannot be cut off. However, the specific historical limitations, such as the Han Dynasty's reliance on cosmological analogies, may lack empirical rigor compared to modern scientific standards. TCM's strength lies in its holistic, harmonious view of health, emphasizing the balance between man and nature, which contrasts with Western medicine's reductionist, evidence-based approach. Also, TCM's subjective interpretations can limit precision. Therefore, integrating TCM's unique wisdom with modern science methodologies can advance its global relevance in the future.

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