

REFUTATION OF THE CLAIM THAT THE ANCIENT CHINESE DESCRIBED THE CIRCULATION OF BLOOD: A CRITIQUE OF SCIENTISM IN THE HISTORIOGRAPHY OF CHINESE MEDICINE

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Many scholars and historians of Chinese medicine and science, in China as well as in the West, have claimed that the ancient Chinese, in particular the unknown authors of the medical classic *Huangdi Neijing* 黃帝內經, anticipated William Harvey's monumental discovery of the circulation of the blood (血液循環 *xueye xunhuan*) by more than two thousand years. This view has been widely accepted in both China and the West. In this article I will first review the historical origin and contemporary popularity of this claim. Then, I will illustrate how unfounded the claim is by examining the historical evidence it is based on. Lastly, I will point out the epistemological reasons for such an obvious mistake and offer a preliminary critique of scientism (唯科學主義 *weikexue zhuyi*), one of the dominant ideologies in twentieth-century historiography of Chinese medicine.

ORIGIN AND DEVELOPMENT OF A HISTORICAL CLAIM

Nowadays it is claimed that the circulation of the blood was explicitly described in traditional Chinese medical literature, more exactly, in *Huangdi Neijing* (usually abbreviated as *Neijing* 內經 and translated as *The Yellow Emperor's Classic of Medicine* or *The Yellow Emperor's Manual of Corporeal Medicine*). In his book *The Genius of China: 3,000 Years of Science, Discovery, and Invention*, a popular distillation of Joseph Needham and his collaborators' historic multi-volume work *Science and Civilization in China*, Robert Temple stated that, although most people believe that William

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Harvey discovered the circulation of the blood in the body in 1628, he was 'not even the first European to recognize the concept, and the Chinese had made the discovery two thousand years before.' Temple continued:

In China, indisputable and voluminous textual evidence exists to prove that the circulation of the blood was an established doctrine by the second BC at the latest. For the idea to have become elaborated by this time, however, into the full and complex doctrine that appears in *The Yellow Emperor's Manual of Corporeal Medicine* (China's equivalent of the Hippocratic writings of Greece), the original notion must have appeared a very long time previously. It is safe to say that the idea occurred in China about two thousand years before it found acceptance in the West.²

The point of view expressed here originated in seventeenth-century Europe not long after Harvey pronounced his revolutionary theory on the movement of heart and blood. As the history of Chinese science and medicine became an academic discipline in the twentieth century, mainly due to the effort of brilliant Chinese and Western scholars, including K. Chimin Wong 王吉民, Long Bojian 龍伯堅, Joseph Needham 李約瑟, and Lu Gwei-Djen 魯柱珍, the claim has been 'documented' and widely accepted as a 'indisputable' historical fact.

As early as in 1685, sixty years later after the publication of Harvey's *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus* (An Anatomical Disquisition on the Motion of the Heart and Blood in Animal), the Dutch East India physician Willem ten Rijnne professed in his *Mantissa Schematica de Accupunctura* -- the first work that introduced acupuncture to the West -- that the ancient Chinese had established the notion of the circulation of the blood before Harvey.

Although the Chinese physicians ... are ignorant in anatomy, they have nevertheless perhaps devoted more effort over centuries to learning and teaching with very great care the circulation of the blood, than have European physicians, individually or as a group. They base the foundation of their entire medicine upon the rules of this circulation, as if they were oracles of Apollo at Delphi.³

In the same year, Issac Vossius, by mistaking the legendary emperor Huangdi as the genuine author of *Neijing*, also asserted that the circulation of the blood had been known in China for more than 4,000 years. Other seventeenth-century scholars like Thomas Baker and Benito Geronimo Fejoo Montenegro

² Robert Temple, *The Genius of China: 3,000 Years of Science, Discovery, and Invention*. New York: Simon and Schuster, 1986, p. 123. *Science and Civilization in China* was one of the greatest scholarly projects of the twentieth century. Needham has praised Temple's *The Genius of China* as a 'brilliant distillation' of *Science and Civilization in China* (See his Introduction to Temple's work). Temple's popular history of Chinese science book was soon translated into Chinese and very warmly received in China.

³ Quoted in Lu Gwei-Djen and Joseph Needham, *Celestial Lancet: A History and Rationale of Acupuncture and Moxa*. London: Cambridge University Press, 1980, p. 37.

agreed with this view that the Chinese had understood for thousands of years that the blood circulated in the body.⁴

In the twentieth century, many Chinese and Western scholars in the history of Chinese medicine and science have expounded the view that ancient Chinese, the authors of *Neijing* in particular, described the circulation of the blood. In 1928, three centuries after the publication of Harvey's *De Motu Cordis*, K. Chimin Wong defined the discussion of *Neijing* on the circulation of the blood as one of the great inventions of the ancient Chinese. In the article 'The Inventions of Ancient Chinese Medicine,' he concluded that many discoveries and inventions in modern medicine had already been made far earlier in ancient China than in the West. Later, with Wu Lien-Tieh 伍連德 in their influential work *History of Chinese Medicine* 中國醫史, which was published first in English, Wu again argued that the *Neijing* described the circulation of the blood. Here it should be noticed that both Wang and Wu were trained in modern Western biomedicine. Wang and Wu stated that the passages from the *Neijing* about the subject are 'very significant' and proved that 'the ancients make a very near guess at the facts.'⁵ At the same time, they realized some difficulties in making the idea valid and convincing. They acknowledged that the statement that Harvey's epoch-making discovery had been anticipated in China by about two thousand years 'is based on rather scanty evidence.' They noticed that no further investigations had been made in China on the subject and that the systematic and pulmonary circulations were not understood. They admitted that in the *Neijing* there is no proper distinction between arteries and veins. However, in spite of these difficulties, Wong and Wu maintained that 'the ancient Chinese had indeed grasped part of the truth concerning the circulation of blood.'⁶

In the 1960s, the Chinese physician-scholar Long Bojian complained that Wong and Wu did not illustrate the issue in sufficient detail. In his *Huangdi Neijing Gailun* 黃帝內經概論, Long thus attempted to prove the claim from several aspects. For him, the *Neijing* recorded the 'very explicit doctrine of the circulation of the blood.' He declared proudly that in *Neijing* 'there were fairly concrete narratives on the circulation of blood, which is a great discovery in the history of medicine in our country.'⁷ In the 1980s, two younger scholars, Liu Xueli 劉學裡 and Zhao Yunfeng 趙雲峰, affirmed that the ancient Chinese not only had had a comparatively complete knowledge on the system of the heart and vessels, but also possessed the 'brilliant thought' of the circulation of blood. Their historical evidence, again, mainly comes from the related texts in the medical classic *Neijing*.⁸

⁴ *Ibid.*, p. 36-37.

⁵ K. Chimin Wong and Wu Lien-Teh, *History of Chinese Medicine: Being a Chronicle of Medical Happenings in China from Ancient Times to the Present Period*, Second Edition, Shanghai, China: National Quarantine Service, 1936 and reprinted by Taipei, Taiwan: Southern Materials Center, p. 35. The role of this book to the twentieth-century historiography of Chinese medicine is like that of Fielding H. Garrison's *An Introduction to the History of Medicine* to the historiography of Western medicine.

⁶ *Ibid.*, p.35.

⁷ Long Bojian, *Huangdi Neijing Gailun* (Outline of the Yellow Emperor's Medical Classic), Shanghai: Shanghai Science and Technology Press, 1985 (1963).

⁸ Liu Xueli and Zhao Yunfeng, 'Our Country Ancient Knowledge on the Circulation of the Blood,' *Yixue yu zhexue* (Medicine and Philosophy) (6): 35-37, 1986.

In their widely-claimed work *Celestial Lancet: A History and Rationale of Acupuncture and Moxa* (1980), Lu Gwei-Djen and Joseph Needham included a special section on the ancient Chinese knowledge relating to the circulation of the blood. They stated positively: ‘Clearly the circulation of the blood and *chhi* [i.e., *qi* 氣] was standard doctrine in the 2nd century, a situation contrasting rather remarkably with the long uncertainty in the Western World, with its idea of air in the arteries, or a tidal ebb and flow of the blood.’⁹ They cited quite a few statements and passages, mostly from *Neijing*, to show that the ancient Chinese had had not only the primary idea but also the ‘more detailed theory.’ Moreover, they dealt with the following related aspects of the subject: the quantitative approach and the estimation on the speed of the circulation in *Neijing*; the Chinese metaphor of the heart as a pump or forge-bellows; and the role of the macrocosm-microcosm analogy in the Chinese world-view. They even raised the possible transmission of this knowledge and its influence on Harvey.¹⁰ Temple’s statement that the ancient Chinese established the doctrine of the circulation of the blood thousands of years ago, which I quoted at the beginning of this section, is completely based on this section in *Celestial Lancet*. Temple summarized the thesis in this way:

The ancient Chinese conceived of two separate circulations of fluids in the body. Blood, pumped by the heart, flowed through the arteries, veins, and capillaries. Ch’i [*qi* 氣], an ethereal, rarefied form of energy, was pumped by the lungs to circulate through the body in invisible tracts. The concept of this dual circulation of fluids was central to the practice of acupuncture.”¹¹

The claim has been so widely disseminated and accepted in China that it not only has been written into the standard textbooks on the history of Chinese medicine and science, but also appears in many popular science publications. For example, it is included in *Ancient China’s Technology and Science*, which was compiled by the prestigious Institute of the History of Natural Sciences, Chinese Academy of Science, and published by the Foreign Language Press in Beijing in 1980. Articles in this work are selected from *Achievements of Science and Technology in Ancient China*, a popular history of science book, which was published in Chinese by the China Youth Press in 1978. The book claims that the narrative of the general and pulmonary circulations in *Neijing* ‘is mainly correct,’ and that *Neijing* also contains a passage that ‘affirmed the relationship between the heart and the blood and its circulation.’¹²

It is evident that the historical claim has been popular in both China and the West. It is still a standard viewpoint, especially in China. Nevertheless, it would be totally wrong to conclude that, as my presentation so far may appear to suggest, that no scholar has ever doubted and challenged the claim. As a matter of fact, in his influential book *Medicine in China: A History of Idea*,

⁹ See Note 2, p.29.

¹⁰ *Ibid.*, pp. 32-36.

¹¹ See Note 1, p. 123.

¹² Yu Yinggao, ‘Two Celebrated Medical Works,’ in The Institute of the History of Natural Sciences, Chinese Academy of Sciences, *Ancient China’s Technology and Science*, Beijing: Foreign Languages Press, 1983, p. 339.

the prominent German historian of Chinese medicine Paul Unschuld has clearly stated: while there is ‘a straightforward concept of circulation in the organism’ of Chinese medicine, this concept ‘differs from contemporary Western ideas in various respects. It is not clear exactly what kinds of substances were thought to circulate and where exactly they were thought to flow.’ His thoughts on the topic at hand, along with his other interpretations on the history of medicine in China, are sophisticated. He suggested that there might be four different schools in ancient China on blood and vessels: the first ‘advocating the circulation of subtle influences [*qi*] in the vessels,’ the second preferring ‘a belief in the flow of blood,’ the third holding ‘the simultaneous circulation of both *ch’i* [*qi*] and blood in identical vessels,’ and the fourth believing ‘in two simultaneous system of circulation, in separate vessels.’ For Unschuld, the *Neijing* texts ‘contain passages that may be interpreted as traces of all four of these differing perspectives.’ Moreover, disagreeing with Needham and Lu and Chinese scholars, he pointed out that ‘No force or “motor” responsible for the ongoing circulatory movement in the body was mentioned’ in *Neijing*. The ancient medical classic contains ‘absolutely no indication as to a conceptualization of either the heart or the lung as fulfilling any kind of pump-like or bellow-like function.’¹³

THE ANCIENT CHINESE DID NOT DESCRIBE THE CIRCULATION OF THE BLOOD

Did the ancient Chinese, specifically the unknown authors of *Neijing*, really discover or at least describe the circulation of the blood — a fundamental achievement in modern medicine and life science? Is there really, in Temple’s words, ‘indisputable and voluminous textual evidence’ ‘to prove that the circulation of the blood was an established doctrine by the second BC at the latest’ in China? My own answer is: definitely not. There are at least four major reasons to refute this claim. First, the circulation described in *Neijing* is not the circulation of blood, but constructive *qi*, or defending *qi*, or the channel *qi*, whose courses of movement in the body have nothing to do with the circulatory path of the blood as advanced by Harvey. Second, Chinese physicians never took the words in *Neijing* as a starting point to investigate the structures and functions of the heart, vessels, and the blood empirically or scientifically. Third, *Neijing* did not possess the intellectual foundation nor

¹³ Paul U. Unschuld, *Medicine in China: A History of Ideas*. Berkeley: University of California Press, 1985, pp.75-76. Please note that the German version of this work was published in 1976. According to my email communication with Prof Unschuld (5 Dec 2001), he also published an article in German in 1984 in which he gave a clear refutation of claims made by Needham and others (See ‘Die Entdeckung des Kreislaufs in der chinesischen Medizin im 2. Jahrhundert v. Chr.,’ *Vorgeschichte und Konsequenzen, Jahrbuch des Instituts für Geschichte der Medizin der Robert-Bosch-Stiftung* 3, Stuttgart, 1984, 17-34.) He expresses his current views on the subject in his introductory volume on the *Suwen* (the first of two parts of *Neijing*), *Huang Di Nei Jing Su Wen. Huang Di’s Inner Classic. Basic Questions: Nature, Knowledge, Imagery in an Ancient Medical Text*, to be published by University of California Press in 2002.

know the empirical facts to make a discovery such as the circulation of blood. Fourth, intellectually speaking, to discover the circulation of blood as Harvey did, the ancient Roman physician Galen's theory of the movement of heart and blood, though wrong, is a better foundation than the *Neijing's* speculative ideas.

The Circulation Described in *Neijing* is *Not* the Circulation of Blood

It is true that in *Neijing*, which consists of two parts, *Suwen* 素問 (Plain Questions) and *Lingshu* 靈樞 (Miraculous Pivot), there exist quite a few sentences and paragraphs that appear to discuss the circulation of blood. The following quotations from *Neijing*, interpreted and translated quite differently by different authors, have been used again and again as the core evidence for the claim that the ancient Chinese had already discovered the circulation of blood.¹⁴ For the convenience of later discussion, I have numbered them. They read:

Evidence 1:

[The materials in] the Channels flows constantly and never stops; ceaselessly moves in circles (*Suwen*, Chapter 39: Differentiation of Pain).

Evidence 2:

Most fundamental for the *yingqi* 營氣 (constructive *qi*) is taking in food as a treasure. Food enters into the Stomach and is transferred to the Lungs. It [the essence derived from food] flows in the inner parts and spreads over the external parts. The most essential from food will move in the tunnels [Channels]. [The constructive *qi*] travels in and nourishes the body. It begins again as soon as it ends. This is the law of the Heaven and the Earth [nature] (*Lingshu*, Chapter 16: The Constructive *Qi*).

Evidence 3:

The *qi*¹⁵ cannot but move continuously. This is like the current of water. This is also like the sun or the moon that move ceaselessly in their orbits. ... [The movement of *qi*] can be compared to a circle without an end. It is impossible to count its revolutions because it begins as soon as it ends (*Lingshu*, Chapter 17: Measures of the Channels).

¹⁴ There are numerous ancient and modern editions of *Neijing*. The original texts of the medical classics cited in this article are basically from the following two influential contemporary editions: Nanjing College of Chinese Medicine, ed., *Huangdi Neijing Suwen: Translation and Commentary*, Second Edition, Shanghai: Shanghai Science and Technology Press, 1981; and Nanjing College of Chinese Medicine, ed., *Huangdi Neijing Lishu: Translation and Commentary*. Shanghai: Shanghai Science and Technology Press, 1986.

¹⁵ Wong and Wu (1936, p. 35) mistranslated this word as 'the blood'.

Evidence 4:

The human being receives the *qi* from food. Food enters into the Stomach and is transferred to the Lungs. Hence, five viscera and six bowels will receive the *qi*. The lighter is the constructive *qi* and the heavier the defending *qi*. The former moves inside the vessels and the latter moves outside the vessels. They circulate endlessly and never stop. When both of them circulate fifty revolutions, they meet each other. This is called “the great convention”. *Yin* 陰 and *yang* 陽 as two forces run through each other just like a circle without an end (*Lingshu*, Chapter 18: The Birth and Meeting of the Constructive and the Defending).

Evidence 5:

The floating *qi*, which does not move along the Channels, is called the defending *qi*; the essence *qi*, which moves along and inside, is called the constructive *qi*. *Yin* and *yang* follow each other in a continuous line; the outside and the inside are linked up with each other. All this is like a circle without an end. They move long and far. Who is able to know the bounds? (*Lingshu*, Chapter 52: The Defending *Qi*).

The crucial question is not whether *Neijing* mentions circulation, but rather, whether the circulation described in *Neijing* is the circulation of the blood in the modern sense or in the Harvey's sense. Undoubtedly, there is much discussion in *Neijing* of circulation. This is very understandable since the conception or metaphor of the circle (circulation) plays a fundamental role in traditional Chinese world-views. Nevertheless, carefully reading the original Chinese texts within their contexts and comparing the concrete paths of the circulations described in *Neijing* with the modern understanding of the circulation of the blood will reveal that what is described in *Neijing* is certainly not the circulation of the blood.

It is necessary to bear in mind that the circulation of blood as a theory in modern physiology and biology means much more than a mere speculative idea that the blood circulates in the body. Among other things, it must demonstrate the course in which the blood moves. According to Harvey, the circulation of the blood was understood as the following process:

the left ventricle----> the arteries ----> the veins----> the right auricle-
 ---> the right ventricle----> the pulmonary artery----> air intake and
 outlet in the lungs----> the pulmonary veins----> the right auricle---
 > the left ventricle.¹⁶

Because the circulation described in *Neijing* mainly deals with the *qi* and blood in the Channels, *Ying* 營 (Nourishment or Construction), and *Wei* 衛 (Defence), let me present what *Neijing* states about the courses of the

¹⁶ William Harvey, *On the Motion of the Heart and Blood in Animals. On the Circulation of the Blood*. In Robert M Hutchins, ed., *Great Book of the Western World*, Vol. 28: Gilbert, Galileo, Harvey. Chicago and London: Encyclopaedia Britannica, Inc., 1952.

motions of the three materials in order to see whether they have anything to do with the circulation of the blood as advanced by Harvey. According to *Neijing*, the moving track of the *qi* and blood in the Channels is identical with the motion of constructive *qi*. The authors of *Neijing* described the circular motion of the constructive *qi* in detail:

Therefore, the *qi* starts from the Hand-Greater-Yin Lung Channel. It transfers to the Hand-Yang-Brightness Large Intestine Channel, ascends to be linked up with the Foot-Yang-Brightness Channel, descends to the upper surface of the foot, and flows to the great toe where it connects with the Foot-Greater-Yin Spleen Channel. It ascends to the abdomen and transfers from the spleen to the heart. Along with the Hand-Lesser-Yin Heart Channel, it gets out of the armpit, down the arm, and is transferred to the tip of the little finger where it connects with the Hand-Greater-Yang Small Intestine Channel. It moves upward through the armpits, reaches to the inner part of the eye-sack, transfers to the cantus of the eye, ascends to the top of the head, descends to the nape where it connects with the Foot-Yang-Brightness Urinary Bladder Channel. It travels along the vertebral column, reaches to the coccyx, descends to the tip of the little toe, and transfers to the middle of the foot where it connects with the Foot-Lesser-Yin Kidney Channel. It ascends to the kidney, transfers to heart from the kidney, extends outside to the chest, travels along the Hand-Reverting-Yin Pericardium Channel, gets out of the armpit, goes down the arm, runs between the, enters the middle of the palm, reaches the tip of the middle finger, and transfers further to the tip of the little finger where it connects with the Hand-Lesser-Yang Triple Burner Channel. It ascends to the center between the two breasts, distributes in the Triple Burner, transfer to the gallbladder from the Triple Burner, gets out from the rib-side, and transfers to the Foot-Lesser-Yang Gallbladder Channel. It descends to the upper surface of the foot, transfers from the upper surface of the foot to the great toe where it connects with the Foot-Reverting-Yin Liver Channel. It ascends to the liver, transfers upward to the lung from the liver, goes upwards further along the throat, gets into the area of nasopharynx, and enters into the “door to the brain”. One of the branches ascends to the forehead, travels along the top of the head, descends to the nape, goes down the coccyx along the vertebral column; this is the Governing Channel. It encircles the genital, ascends across the pubisure part, enters into the center of the nave, travels upwards further to the inner part of the abdomen, enters into the “Empty Basin” (upraclavicular fossa), connects with the lung, and returns to the Hand-Greater-Yin Lung Channel. This is the complete and regular course of the constructive *qi* (*Lingshu*, Chapter 16: The Constructive *Qi*).

This passage immediately follows Evidence 2 cited at the beginning of this section. This long quotation thus should be seen as the *Neijing*'s self-explanation of the circulation mentioned in Evidence 2. Obviously, no further

explication is needed to conclude that, in regard with their concrete moving courses, the circulations of the constructive *qi* discussed here are totally unrelated to the modern understanding of the circulation of the blood. Because the circulation of the materials (*qi* and blood) in the Channels by and large goes along with the course of the constructive *qi*, the movement of *qi* and blood in the Channels is thus totally unrelated to the circular movement of the blood as well. Moreover, in the circulation of constructive *qi*, the role of *fei* 肺 (the lungs) is much more significant than that of heart, while in the circulation of blood, the heart is the most crucial organ.

Is the movement of the defending *qi* closer to the circulation of blood? The *Neijing* delineates the movement of the defending *qi* in the human body in detail. It states:

The defending-qi circulates the whole body fifty times in one day and one night. It moves in the *yang* twenty-five times in day. It moves in the *yin* twenty-five times in night. It also circulates around the Five Viscera [i.e., the Heart, the Lung, the Liver, and the Kidney]. In the early morning, the *yang-qi* starts from the eyes when the *yin-qi* ends. The defending-*qi* ascends to the head, as the eyes are open. It travels along the nape, descends to the Foot-Greater-Yang Urinary Bladder Channel, and goes down further to the tip of the little toe. A distributive part leaves from the point of Inner Canthus, descends to the Hand-Greater-Yang Small Intestine Channel, and goes further down to the external side of the tip of the little finger. Another distributive part leaves from the point of Inner Canthus too, descends to the Foot-Lesser-Yang Gallbladder Channel, and transfers to the middle between the little and the second toes. It ascends along the line of the Hand-Lesser-Yang Triple Burner Channel, and then gets down to the middle between the little finger and the forefinger. A branch ascends to the area before the ear, connects with the channels in the area under the chin, transfers to the Foot-Yang-Brightness Stomach, descends to the upper surface of the foot, and enters to the middle of five toes [the point between the second and the third toes]. Another distributive part leaves from the ear, descends to the Hand-Yang-Brightness Large Intestine Channel, enters to the point between the thumb and the forefinger, and then to the middle of the palm. The defending-*qi*, which reaches the foot [from the Foot-Yang-Brightness Channel], enters the middle of the foot, gets out of the lower part of the inner ankle bone, moves in the *yin*, and returns to the eyes. This completes a circle (*Lingshu*, Chapter 52: The Defending *Qi*).

Once again, no further explanation is needed to conclude that the circulatory path of the defending *qi* described in traditional Chinese medicine and the circulation process as understood in modern physiology are totally different.

Through citing *Neijing* in length, I believe that I have demonstrated that what was articulated in the medical classic about the circulation of constructive *qi*, or defending *qi*, or channel *qi* has nothing to do with the circulatory paths of the blood as advanced by Harvey. Wong and Wu mentioned that the

passage from *Neijing* is ‘incorrect’ in the view of modern physiology because it described the blood stream, the whole circular process of which starts from the foot, travels to the kidneys, the heart, the lungs, the liver, the spleen, in the order named, and then goes from the spleen back to the kidneys, thus making a complete circuit.¹⁷ Actually, it is not the unknown authors of *Neijing* who are mistaken here, but Wong and Wu themselves. *Neijing* was not discussing the circulation of the blood at all, but something else.

Chinese Interpretations of *Neijing*

Many people do not argue that *Neijing* describes the circulation of blood as explicitly as Harvey did. But they believe that the knowledge in *Neijing* on circulation constitutes the seeds of the modern physiological theory. In other words, like the sprout to the plant or tree, *Neijing* represents the embryonic stage of a great discovery. If this is the case, *Neijing* should be a starting point for the later Chinese doctors to investigate the structure of the heart and vessel system and the movement of blood. However, the historical fact is that, although hundreds of scholars in history wrote numerous notes and commentaries to the medical classic, no one developed the idea of circulation in *Neijing* into a systematic doctrine of the circulation of the blood.

Actually, even though *Neijing* remains the most authoritative classic in the whole history of traditional Chinese medicine, the question about how the blood moves in the body was never really raised by ancient Chinese physicians. Here, the greatest Chinese anatomist Wang Qing-Ren 王清任 provides a powerful testimony to this. In his *Yilin Gaicuo* 醫林改錯 (Errors in Medicine Corrected) published in 1831, Wang charged that the lack of detailed knowledge about the structure of the human body resulted in many errors and contradictions in ancient Chinese medical literature. Even though *Yilin Gaicuo* seems primitive, in terms of the size and content, when compared with *De humani corporis fabrica libri septum* (On the Fabric of the Human Body in Seven Books), to a large extent, Wang can be called the “Andreas Vesalius in China”. He is the Chinese physician whose conceptual framework, logical thinking and methodological approach come closest to modern Western medicine. Moreover, Wang is even better known for his distinctive theory of *qi* and blood. He invented the method and several recipes of activating blood movement and removing blood stasis, which are still of great clinical value in contemporary Chinese medical practice. However, there is not one word in *Yiling Gaicuo* about how the blood circulates in the body. In addition, Wang himself made many mistakes as he attempted to correct the anatomical errors of previous generations. For example, in regard to the anatomical and physiological aspects of the heart, vessels and blood, Wang, based on the empirical ‘facts’ he gathered from observing some children’s corpses shallowly buried in a public commentary, claimed that there exists no blood in the heart. He called the arteries the ‘vessels of *qi* (air)’ because he

¹⁷ See Note 4, p. 35.

thought there was no blood in them either. When he refers to 'vessels of blood' in his anatomical dictionary he meant only the veins.¹⁸

No Chinese physician began to investigate the structure and functions of the system of the heart and blood (in the modern sense) after reading *Neijing*. Similarly, no traditional scholar of the medical classics interpreted and explained the texts in this way. Let us use the great physician and expert on the *Neijing*, Zhang Jiebin 張介賓 as an example to see how traditional medical scholars understood and annotated the same passages which modern historians have taken as the evidence for their claim that *Neijing* explicitly described the circulation of blood. After having working on his project for forty-five years, Zhang published his *Leijing* 類經 (Classifying Compilation of *Neijing*) in the year of 1624, only four years earlier than the publication of Harvey's *De Motus Cordis*. *Leijing* is usually considered one of the most important sources for the study of *Neijing* and Chinese medical theories. With regard to the section of *Neijing* on circulation that I list above as Evidence 4, Zhang's explanatory notes state:

The movement of the constructive *qi* circulates ceaselessly in the body. It circulates fifty times in the whole body in a day and a night, then, returns for the "Great Convention". It moves in *the order of the Twelve Channels*. One travels by *yin* and the other by *yang*; one travels by the exterior and the other by the interior. They move in a continuous line and run through each other. It begins as it ends. This is why it is called "like a circle without an end." "The Great Convention" means the meeting of the constructive, the defending, *yin* and *yang* (*Leijing*, Vol. 8: The Constructive, The Defending and the Triple Burner).

In response to the section listed above as Evidence 2, Zhang's annotations read:

The food enters into the Stomach and is transferred to the Lungs. The lighter becomes the constructive; the heavier becomes the defending. Therefore, the heavier essence moves in the tunnels. It always moves and starts again as soon as it ends. It *flows and circulates in the Twelve Channels* (*Leijing*, Vol. 8: The Order of the Movement of Construction and Defense. Italics added).

Here, Zhang is very clear that the circulation discussed in *Neijing* is the circulation of the constructive *qi* in the Twelve Channels whose course, as I have shown above, has nothing to do with the circulation of blood as understood in modern life science.

Neither Zhang nor any other traditional *Neijing* expert has interpreted the related texts as implying that the blood moves from the heart to the whole body by the way of arteries and back to the heart by the veins. Was the

¹⁸ Jing-Bao Nie, 'A Comparative Study on Wang Qingren and A. Verslium,' *Zhongyiyao Xuebao* (Acta of Chinese Medicine and Pharmacology) (6):1-4, 1989; and 'On Wang Qingren: His Times and Medical Achievements,' *Hunan Zhongyi Xueyuan Xuebao* (Journal of Hunan College of Traditional Chinese Medicine) 10(3):177-179, 1990.

scholarship of traditional physicians not good enough to decipher *Neijing*'s sublime words and their profound meanings? Or has the imagination of modern historians been so wild that they have distorted *Neijing* by imposing what they already knew onto the classical texts? Obviously, it is the latter. As a matter of fact, the origin and development of the specious claim shows that reading the related passages in *Neijing* as a description of the circulation of blood is a post-Harvey phenomenon. The promoters of the claim in the twentieth century mentioned in the first section of this paper (Wang, Wu, Lu, Needham, Liu and Zhao) all knew Harvey's theory of the circulation of blood before they read *Neijing*.

Lack of Intellectual and Empirical Foundations

Any scientific discovery cannot be made without certain empirical knowledge within an intellectual tradition. According to the extant historical materials, there did not exist the intellectual tradition or the empirical foundation necessary for discovering the circulation of blood in China at the time *Neijing* was compiled. It was not until the introduction and spread of Western medicine that this occurred. At the time *Neijing* was compiled Chinese did not know the fundamental empirical facts necessary to understand the circulation of blood. These facts include: the distinction between the arteries and veins, the distinction between blood in arteries and blood in veins, the anatomical structure of the heart (the two ventricles and two auricles), the contraction of heart as the cause of the movement of blood, the existence of cardiac and vessel valves and their basic function of making the blood move in one direction. The ancient Chinese were unfamiliar with and indifferent to anatomical and physiological exploration in the modern Western sense, since Chinese medicine has its own unique understandings about the human body and illness. The internal organs in the 'Viscera and Bowels' theory of traditional Chinese medicine, which are mainly based on *Neijing*, are not identical with nor do they even correspond to the organs in Western medicine. It is well known that in traditional Chinese medicine great emphasis is not placed on the anatomical structure of the organ. The viscera and bowels in the medical system of *Neijing* should be viewed as units of physiological functions, rather than as anatomical substances. Even though there are some paragraphs in *Neijing* which emphasize the possibility and significance of dissecting the human body and measuring its parts, anatomy was never the intellectual basis of the medical classic. In the entire history of China, even though there are some records about anatomic incidents, no *systematic* anatomy was ever developed until the Western medicine was introduced.¹⁹

¹⁹ Jing-Bao Nie, 'The Historical Fact and Causes of Underdevelopment of Anatomy in Ancient China,' *Hunan Zhongyi Xueyuan Xuebao* (Journal of Hunan College of Traditional Chinese Medicine) 7(3):42-45, 1986.

***Neijing* in contrast with Galen and Harvey**

Even if we assume that the circulation described in *Neijing* actually refers to the circulation of the blood, what is accomplished in *Neijing* is still too fragmented and speculative in comparison with the discovery of Harvey. As the historians of Western medicine have pointed out, the real importance of Harvey's work for the history of medicine and science is 'not so much the discovery of the circulation of the blood as its quantitative or mathematical demonstration. With this start, physiology became a dynamic science.'²⁰ Harvey 'not merely put forward' the circulation of blood as an idea or a theory; through his efforts, the idea 'was proved by morphological, mathematical, and experimental arguments.'²¹

It has been often mentioned that, although *Neijing* may not describe the circulation of the blood in the complete manner that Harvey did, its theory about the blood's motion is still better and more correct than that of the great Roman physician Galen. For Galen, the principal movement of blood was forward, like the ebb and flow of the tide. Galen's idea on the movement of blood dominated the Western medical world for more than fourteen centuries and was still the standard theory in Harvey's times. However, it seems to me that, intellectually speaking, Galen's conception on this topic in particular, and his medical system in general, are a better foundation for the discovery of the circulation of blood than *Neijing*. The intellectual connections between Galen and Harvey cannot be explored in details here, but it is important to point out that Harvey's discovery started from Galen's medical achievements.²² First, Galen discovered some fundamental facts on the movement of blood, such as that there was blood in arteries and that the blood in arteries and the blood in veins was different. Second, Galen's model on the blood's movement, though wrong in the general sense, provided an object for later physicians to criticize and correct. Third, some experiments Galen conducted (e.g. on how the valves of the heart determined the direction of the blood's motion) prepared the path for discovering the circulation of blood. Fourth, and most significant, Galen established the foundation of the experimental methods of modern Western medicine, experimental physiology in particular. As George Sarton summarized, Galen not only 'understood the need for experiments' but also 'justified it in saying that the experimental path is long and arduous but leads to the truth, which the short and easy way (uncontrollable assertion) leads away from it.'²³ As Charles Singer concluded, 'Harvey took up his theme practically where Galen had left it.'²⁴ Without Galen's heritage, it would have been difficult, if not impossible, for Harvey to develop his theory on the movement of blood.

²⁰ Fielding H. Garrison, *An Introduction to the History of Medicine*, Fourth Edition, Philadelphia and London: W.B. Saunders Company, 1929, p. 247.

²¹ Erwin H. Ackerknecht, *A Short History of Medicine*, Revised Edition, Baltimore and London: The Johns Hopkins University Press, 1982, p. 113.

²² Jing-Bao Nie, 'Galen and Modern Western Medicine,' *Zhonghua Yishi Zhazi* (Chinese Journal of Medical History) 19 (4): 30-33, 1989.

²³ George Sarton, *Galen of Pergamon*, Lawrence, Kansas: University of Kansas Press, 1954, p. 48.

²⁴ Charles Singer, *A Short History of Anatomy and Physiology from Greek to Harvey*. New York, 1957, p. 175.

Much contemporary research on Chinese medicine, as developed from *Neijing*, has led to the conclusion that it is markedly different from Western medicine, as it developed from the work of Galen, Vesalius and Harvey. This has led to the conclusion that the two medical systems should be seen as fundamentally different, as representing two ways of seeing and thinking.²⁵ The fundamental methodology of *Neijing* and Chinese medicine has been articulated as a 'system of correspondence' or a 'holistic methodology.' The physiological doctrines in *Neijing* have an incompatible or incommensurable nature in comparison with the physiological theories and approaches of Galen and Harvey. The medical works of the two great second-century physicians, Zhang Zhongjing 張仲景 and Galen, display this fundamental difference vividly and powerfully.²⁶ In other words, the analytic and experimental medical tradition, if existing at all, has been very weak in Chinese history.

In conclusion, not only did *Neijing* not describe the circulation of blood, according to the historical logic of Chinese medical and scientific traditions, it was also not possible for the authors of *Neijing* to make such a discovery.

A CRITIQUE OF SCIENTISM IN THE TWENTIETH-CENTURY HISTORIOGRAPHY OF CHINESE MEDICINE

The above presentation, I believe, has proven that interpreting the relevant statements and passages in *Neijing* as descriptions of the circulation of blood is unfounded. The speciousness of the claim is so obvious that one cannot help wondering why so many scholars have advocated it and why it has been accepted so widely. Undoubtedly, there are technical or scholarly reasons for this. Technically speaking, the mistake results from the habit of garbling a statement or passage from the historical literature to understand and interpret it out of context. This tendency is one of the ever-lasting problems in studying and writing history. In Chinese there is a special phrase to describe this problem: *duanzhang quyì* 斷章取意 (garble a statement or quote out of context). In the footnote to his refutation to the Lu and Needham's claim that the heart was understood as a bellow in the *Neijing*, Paul Unschuld has pointed out that the argumentation represents

an example of the approach not unfrequently employed by these authors when they cut out short statements with a particular meaning from longer passages conveying, as a whole, a rather

²⁵ Manfred Porket, *The Theoretical Foundation of Chinese Medicine: Systems of Correspondence*. Cambridge and London: The MIT Press, 1974; Liu Changling, *The Philosophy of Neijing and the Methods of Chinese Medicine*. Beijing: Science Press, 1982; Ted J. Kaptchuk, *The Web That Has No Weaver: Understanding Chinese Medicine*. New York: Congdon & Weed, 1983.

²⁶ Jing-Bao Nie, 'Comparative Studies on Zhang Zhongjing and Galen,' Master's Degree Thesis, Changsha: Hunan College of Chinese Medicine, 1986; see also Jing-Bao Nie, 'Zhang Zhongjing and Galen: The Beginning of the Differences of Chinese and Western Medicine,' *Zhongyiyao Xuebao* (Acta of Chinese Medicine and Pharmacology) (1): 2-7, 1990.

different meaning, and also when they confuse the ideas conveyed by commentaries added many centuries later with the concepts conveyed by an original source.²⁷

Of course, distorting the meanings of historical texts cannot always be easily distinguished from imaginatively and creatively interpreting these texts. The latter is an essential element of any good historical study.

Nevertheless, the specious claim that Chinese discovered the circulation of blood does not represent simply a technical mistake in the modern historiography of Chinese medicine and science. As a matter of fact, the origin, spread and wide acceptance of the specious claim in the historiography of Chinese medicine constitutes a glaring example on how strongly what people want to see influences and even determines what they actually see in their historical studies. Socio-cultural discourse can often define or influence our perceptions of the past. For example, socio-politically and culturally speaking, the popularity of the historical claim in China relating to the discovery of the circulation of blood is closely related to the prevalence of nationalism in the social and academic life of twentieth-century China. In other words, many Chinese scholars and lay-people, proceeding from a sense of pride in China and its cultural heritage, want almost by “instinct” to believe the truthfulness and validity of the historical claim. Patriotism has had a powerful influence over the study of the history of Chinese science and medicine. Ironically, in acting this way, people are actually using modern Western medicine and sciences as the standard by which to measure, understand, and interpret achievements in Chinese medical traditions.

Scientism and its Limits

In this section I would like to argue that, if nationalism is the most significant political factor for the popularity of the unfounded historical claim in China, scientism is the most significant epistemological reason for the obvious historical mistake over the discovery of the circulation of blood. Scientism has been, and remains, the dominant intellectual discourse in twentieth-century historiography of Chinese medicine and science, and serves as the only standard of truth. It provides the foundation for the evaluation of all the other systems of knowledge, including traditional Chinese systems.

The definition of the term scientism is elusive. First of all, scientism can be conceived as a conscious and identifiable philosophy or philosophical assumption. According to John Wellmuth, “scientism” involves

the belief that science, in the modern sense of that term, and the scientific method as described by modern scientists, afford the only reliable means of acquiring such knowledge as may be available about what ever is real.²⁸

²⁷ Unschuld, *Medicine in China: A History of Ideas*, p. 371.

²⁸ John Wellmuth, *The Nature and Origins of Scientism*. Milwaukee: Marquette University Press, 1944, pp.1-2.

According to Jurgen Habermas, scientism is the basic orientation prevailing in analytic philosophy. He sees scientism as ‘science’s belief in itself,’ that is, ‘the conviction that we can no longer understand science as *one* form of possible knowledge, but rather must identify knowledge with science.’²⁹ Secondly, scientism is not only a general metaphysical scheme, but also a cultural phenomenon with the kind of emotional attributes of a substitute religion. R. G. Owen attacks scientism as a form of idolatry, which he terms ‘scientolatry’. As a result of this exalted status, science has, he remarks, ‘come to be worshipped as omniscient, omnipotent and the bearer of man’s [sic] salvation.’³⁰ For Owen, the result of this ‘scientolatry’ is the view that all problems can be solved scientifically, and that science can even examine questions of spirit, values, and freedom. D. W. Y. Kwok points out that the two characterizations of scientism, i.e. philosophical and cultural, complement one another. He considers scientism in general as ‘a form of belief arising from a tradition or heritage in which the limiting principles of science itself have found general application and have become the cultural assumptions and axioms of that culture.’³¹

Nevertheless, no matter how difficult it is to give a definition of scientism, it is certain that it was one of the most influential modes of thought throughout the world during the twentieth century. It has been strongly held in social sciences (taking the form of positivism) and throughout almost every aspect of social life of the Western world (taking the form of science and technology worship). Along with the global movement of industrialization and modernization, beliefs in science and the worship of modern technology have also been transported to and taken root in non-Western societies, including China. Scientism exists both within and outside philosophy. Tom Sorell has offered a systematical analysis on scientism in Western philosophy. Although he does not deny that scientific ways of thinking can be found elsewhere, Sorell is much less keen to criticize scientism outside philosophy than scientism within philosophy, because he holds that ‘outside philosophy, scientism sometimes has the useful effect of bolstering up an appreciation of, and respect for, science in the face of anti-scientific and pseudo-scientific ideas.’³² While I can see his point that scientism outside philosophy can reduce the influence of anti-science or pseudo-science, it can also inhibit genuine understanding, as is the case with assessments of Chinese medicine.

Here it is necessary to emphasize that I believe scientism is a kind of misunderstanding or misinterpretation of the social and cultural functions of modern sciences and methods. Therefore, to criticize scientism does not mean to attack modern science and its methods, but rather to question the attitude which places too high a value on science in comparison with other branches of learning or culture, to the extent of even seeing scientific truth as the only reliable truth. In his *Knowledge and Human Interests*, Habermas has made it very clear that a critique of scientism is not an attack on science but an attack

²⁹ Jurgen Habermas, trans. by Jeremy J. Shapiro, *Knowledge and Human Interests*. London: Heinemann, 1972, p. 4.

³⁰ R. G. Owen, *Scientism, Man, and Religion*. Philadelphia, 1952, p. 20.

³¹ D. W. Y. Kwok, *Scientism in Chinese Thought 1900-1950*. New Haven and London: Yale University Press, 1965, p. 21.

³² Tom Sorell, *Scientism: Philosophy and the Infatuation with Science*. London and New York: Routledge, 1991, p. 2.

rather upon an arrogant and mistaken understanding of science that reduces all knowledge to some expression of a natural science.

In the social and cultural life of twentieth-century China, science replaced Confucianism and became the highest standard of value. Traditional Chinese medicine also succumbed to the disease of scientism. As a dominant discourse, scientism permeated almost all modern studies of Chinese medicine. Modern science and “scientific” philosophies, like dialectical materialism, were adopted to interpret traditional Chinese medicine and the Chinese medical system. Scientism was so pervasive that the statement ‘Chinese medicine is a science’ has been accepted as a kind of truism in contemporary China.³³ What is really interesting is that, even though conservatives and the iconoclasts had attitudes to traditional medicine that were as different from one another as black from white, they defended or rejected traditional medicine in name of the same values -- science and progress. On the one hand, medical traditionalists have been at pains to prove that China not only already had a completely scientific medicine, but that this was even more scientific than Western medicine. On the other hand, the modern Chinese medical iconoclasts’ attacks on traditional medicine derive from a deep respect for modern biomedicine as representing the values of science, the enlightenment and modernity, coupled with the belief that traditional medicine is non-modern, non-scientific and even anti-scientific.³⁴

Due to the influence of scientism, Chinese medicine is seen either as un-scientific (even anti-scientific) or as a proto-scientific (and pre-scientific). In the former case, the differences between Chinese medicine and sciences have been exaggerated to the extent that Chinese healing is seen as mere hocus-pocus. In the latter case, concepts, theories, methods and procedures from modern sciences have been applied to study Chinese medicine and great effort has been made to discover the consistence and convergence between the two systems. It is emphasized that Chinese medicine is fundamentally compatible with modern sciences and, moreover, that its holistic orientation provides a sort of spiritual guide for biomedicine. As a result, the great differences and incompatibilities between the two systems have been minimized.

In the twentieth-century historiography of Chinese medicine, the two most important questions were: how many scientific achievements were anticipated in Chinese medicine and why did the scientific and medical revolutions not occur in China? However, the crucial question should be:

How and why is it possible for traditional Chinese medicine to remain effective in practice and challenging in theory even though it possessed no knowledge of the circulation of the blood nor of modern anatomy and scientific physiology?

³³ Jing-Bao Nie, ‘Scientism and Traditional Chinese Medicine in 20th-Century China,’ *Yixue yu Zhexue* (Medicine and Philosophy) 16(2): 62-66.

³⁴ Ralph C. Croizier, *Traditional Medicine in Modern China*. Cambridge: Harvard University Press, 1968.