# Twenty Years of Nèijīng Research: What Has Been Learned? Part 1. Background and Principles

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# Abstract

By the 1980s, a majority of early Chinese texts had been placed on computer databases. This undertaking allowed new, potentially paradigm-shifting, approaches to classical text research. While the full potential of this research has yet to be realised, information discovered to date significantly alters our picture of the early practices and theories of Chinese medicine and presents a wide-ranging collection of new research and clinical opportunities to be explored. This information has the potential to change the way Chinese medicine is understood, taught and practised in significant ways. As such, it affirms the profession by providing new challenges and opportunities and at the same time presents unique challenges by requiring the reevaluation of core concepts. Part one of this article reviews work done over the past 20 years on the *Huángdì nèijīng* and presents some of the findings discovered using these research approaches. Part two will review the clinical methods that have been developed from this research.

# Keywords

Chinese medicine, classical, Huangdi neijing, acupuncture

# I. The Huángdì nèijīng text

The *Nèijing* text remains the undisputed source text for all Chinese medicine theories and practices and has held this position unchallenged for over two thousand years.<sup>1</sup> Simply stated, if a clinical practice can trace its theories and practices back to the central ideas found within the *Nèijīng*, it is a practice that exists within the tradition of Chinese medicine. Conversely, if it cannot do this, it does not exist within this tradition.<sup>2</sup> Most importantly, these early writings provide detailed descriptions of the practices of Chinese medicine as they were originally envisioned and carried out by the creators of this tradition. Despite the

critical role of these texts over the centuries, the writings of the *Nèijīng* are difficult to understand and put into clinical practice. Consequently - and particularly in the West - our understandings of the principles and practices of the *Nèijīng* have remain limited.

The *Nèijīng* itself is not a typical medical textbook in a contemporary sense—attempts to read it as such usually bring limited results. Rather, it is better viewed as an ancient text-container that preserves a collection of traditional medical writings that were derived from a variety of sources. An analogy can be made to an ancient wooden box that

contains various writings from different writers and times. Until a definitive edition was published in the Northern *Sòng* dynasty (960–1127 CE), the various writings in this container underwent a process of continual rearrangement, refinement and editing, although their key contents were likely largely conserved.<sup>3</sup> For these reasons, the *Nèijīng* is best studied not as a typical medical textbook - read from beginning to end - but rather approached using a variety of formal research methods that allow for in-depth analysis of its key terms and principles.

# I. Huángdì nèijīng research: the text-based archeological site

As noted above, the action of placing the *Nèijīng* and other early Chinese writings on databases has allowed for new ways of researching and interpreting these texts. Specifically, it has enabled early Chinese texts to be approached as text-based archeological sites. In the methodology of text-based archeology, characters and text passages become discovered relics that are carefully excavated and examined using a variety of research techniques. This approach differs in significant ways from traditional lineagebased systems, in which knowledge is passed down in a continuous transmission from teacher to student and in which the preservation of orthodox viewpoints is often

prioritised. While both approaches have unique value and complement one another, approaching this material as a textbased archeological site allows for new ways of understanding these ideas, and reveals important and previously unknown aspects of the original practices and theories of Chinese medicine.<sup>4</sup>

These concepts represented a radical departure from the consensus of the times, in which deities and supernatural forces played a primary causative role in the workings of the world.

# III. Huángdì nèijīng Text Research: The Research Method

Over the past twenty years, a formal approach to text-based archeology has been developed. This approach starts with the identification and analysis of specific key terms and progresses to a deeper understanding, using a process of circular assessment and refinement. To begin, a key research term is identified within the source texts. Next, all passages containing the research term are identified and undergo a series of first-pass translations. From these initial translations, a preliminary working definition for the term is constructed. The initial working definition is then refined through a process of ongoing text analysis and research. After an initial working definition for a term is established, this definition is then used to retranslate other passages within the source text. These steps are repeated through ongoing research and refinement (figure 1). As part of this process, definitions undergo a series of formal checks and validations (figure 2). A primary focus of this research lies in identifying holographic translation viewpoints that can be used to reinterpret and unlock deeper meanings of the text.5 While this approach has hitherto been used primarily to study the Nèijing, it can also be used to study other early Chinese texts. To date, this research methodology has yielded surprising and potentially paradigm-shifting results with regard to the original practices and theories of Chinese medicine. A few examples of these research findings are discussed below.

# IV. Huángdì nèijīng text research: some current findings

### A. The principle theories and writings of the Nèijīng likely originated during the Warring States Period

The development of the *Nèijīng text* is complex and poorly understood, and many questions as to its origins remain

unanswered. According to much present-day scholarship, the primary development of the *Nèijīng* took place sometime during or after the *Hàn* dynasty (206 BCE–220 CE), with significant editorial changes occurring up until the *Táng* dynasty (618–907 CE). This view is supported by archeological

findings, which have failed to contain references to the *Nèijīng* text prior to the *Hàn* dynasty.<sup>6</sup> However, new research suggests that the seminal writings and theories of the *Nèijīng* may have emerged earlier, during China's Warring States period (475–221 BCE), amidst the intellectual flowering of the Hundred Schools of Philosophy.<sup>7</sup> Particularly influential in the *Nèijīng*'s formation were the teachings from early secular Daoism and the *Yīn-Yáng* School of nature-based philosophy, the latter typified by the teachings of the natural scientist-philosopher *Zōuyǎn* and the scholars of the *Jìxià Gate Academy*.<sup>8</sup> Collectively, these ideas led to revolutionary new ways of interpreting the natural order of the universe by using scientific observations of the natural world to deduce theories and principles regarding the basic



#### Figure 1. Nèijīng text archeology - the research method

Over the past 20 years, a formal approach to Nèijīng text research has been developed. In this method, key research terms are identified that then go through a process of circular refinement and analysis to establish working definitions. These definitions are then used to reexamine key terms and retranslate the source text. A fundamental aspect of this process is the need to approach the material with an open mind, leaving behind as much as possible any preconceived notions.

nature of the cosmos. In the *Nèijīng*, these ideas were then used to establish a comprehensive practice of medicine. These concepts represented a radical departure from the consensus of the times, in which deities and supernatural forces played a primary causative role in the workings of the world.<sup>9</sup> For over two-thousand years, the ideas and theories of the *Nèijīng* have stood the test of time and to this day they represent one of the most profound and deeply influential scientific revolutions in human history.

The conclusion that the primary writings and theories of the *Nèijīng* may have an earlier Warring States origin is based on five primary research findings: (1) the sophistication and complexity of its technical descriptions; (2) the widespread prevalence of written documentation; (3) the poor condition of the post-*Hàn* dynasty text; (4) a lack of documentation of *Nèijīng* practices following the *Hàn* dynasty; and (5) marked disparities and apparent disruptions between the methods and theories presented in the *Nèijīng* and subsequent patterns of clinical practice.

As noted above, the *Nèijīng* is best thought of as an ancient text container that preserves a compilation of early texts written by various unknown authors who likely practised in different regions and groups.<sup>10</sup> The sophistication and complexity of these descriptions suggest that at the time of their documentation these practices were well-established and had been in use for some time. In particular, descriptions of human anatomy and physiology are highly detailed and, in many cases, more advanced than descriptions currently found in Chinese medicine.<sup>11</sup> Based on the amount and complexity of medical information found in the *Nèijīng*, it appears evident that it was compiled at a time when written documentation was widely practised. Yet, despite important advances in writing and wood-block printing that were made during the *Hàn* dynasty, virtually no written records of physicians practising complex *Nèijīng* methods during or following the *Hàn* dynasty have been found. If these clinical practices had originated in the *Hàn* dynasty, it seems likely that some written records would still exist to document these widespread practices.<sup>12</sup> The early practice of acupuncture described in the *Nèijīng* was based on ecological models of vascular rivers and hydrology. After the *Hàn* dynasty, acupuncture deviated to become a system based on channels and point actions, akin to what is practised today. Virtually all of the post-*Hàn* dynasty editors



#### Figure 2. Nèijīng text archeology - validation steps

As initial working definitions are established, they undergo a series of formal validation steps. In addition to being consistent with their uses in the Nèijīng text, working definitions should also be consistent with the general culture, history, and language of early China, be consistent with recognized patterns of nature, and demonstrate relevance and efficacy in clinical practice.

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Figure 3. Schematic of Nèijīng text development (a revised model)

In a revised model, the primary theories and writings of the Nèijīng were likely established during China's Warring States period (475–221 BCE). Early in its development, the Nèijīng experienced a critical disruption in text transmission. Following its discovery in the Hàn dynasty, different editors undertook to repair, correct, and clarify the text. This culminated in the currently recognized text produced by the Northern Sòng Imperial Editing Office in 1057 CE. The Needling Classic (針經 Zhēnjīng), now known as the Divine Pivot (靈樞 Língshū), likely diverged early on from the Yellow Emperor's Plain Questions (黃帝內經素問 Huángdì nèijīng sùwèn) and was later combined with the Sùwèn by Wáng Bīng in the Táng dynasty (6th century CE). Particularly in relation to the practice of acupuncture, critical early disruptions in text transmission make it likely that early theories and practices differed significantly from those established after the Hàn dynasty that have persisted up to the current day.

of the *Nèijīng* text describe finding a text that was in disarray and in poor repair, containing concepts and terms that were difficult to comprehend. If these texts had originated during the *Hàn* dynasty, it seems likely that these practices and concepts would have been understood more clearly.

Taken as a whole, these findings suggest that sometime early in its development, the N i j j n g text likely suffered a critical disruption in transmission, and furthermore that this disruption occurred sometime prior to the H andynasty. In fact, this type of literary disruption was the general rule rather than the exception for many Warring States philosophical and scientific texts, which fell victim to the literary and scholarly purges of the authoritarian Qin dynasty (221–206 BCE).<sup>13</sup> A critical implication of this disruption in transmission for the practice of Chinese medicine is that the initial theories and clinical practices envisioned and set forth by the creators of the profession likely differed in significant ways from the theories and practices that developed after the *Hàn* dynasty and continue up to the current day. Furthermore, attempts to interpret and understand the early practices of Chinese medicine from the perspective of current practices and viewpoints are likely to bring limited results.

From these findings, a newly revised model of the *Nèijīng*'s development can be established. According to this model, the primary writings and practices of the *Nèijīng* 

were likely set down sometime during the intellectual flowering of the Warring States period (475–221 BCE), during a time of intense warfare and medical innovation.<sup>14</sup> When the *Qín* dynasty finally prevailed in the Warring States conflict in 221 BCE, the newly established dynasty would have likely assimilated texts from various conquered states into its imperial library system. While ensconced in the *Qín* imperial library, these texts likely suffered a

similar fate to other texts of the time, with many of their key principles and practices becoming obscured and lost, only to be rediscovered at a later date.

When the *Hàn* conquered the *Qín* in 206 BCE, the *Hàn* rulers would have also likely

incorporated the texts of the Qin imperial library into their own library system. These texts may have then lain dormant in the Hàn imperial library until their subsequent discovery during the library's official 21-year inventory that was carried out between 26-5 BCE.15 Based on a revised historical model, the reason that the Nèijing text is not currently represented in archeological findings prior to the Hàn dynasty is that the writings lay dormant in the Qín and Hàn imperial libraries until their discovery during this official inventory. Later, when these texts eventually did come to light in the Hàn dynasty, as with other Warring States texts, they were fragmented, in poor repair and contained language and concepts that were difficult to understand and put into practice. During the period from the Hàn dynasty to the establishment of the currentlyaccepted official edition of the Nèijing in the Northern Sòng dynasty, the contents of the Nèijing went through a phase of continual editing, refining and amending to produce

the contemporary text we recognise today (figure 3).

# B. Issues of basic terminology

For students and practitioners of Chinese medicine, Chinese medicine terminology

can often be confusing and difficult to understand. In this regard, it is useful to remember that at the time of their original creation, the basic terms of Chinese medicine likely had widely accepted uses and clearly understood meanings. Later confusion regarding issues of language and terminology likely developed as a consequence of the critical disruptions in text transmission that occurred prior to the *Hàn* dynasty, as discussed above.

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In the *Nèijīng* and other early Chinese texts, terminology has an established hierarchy of meaning that begins with primary definitions and progresses to secondary manifestations. Primary definitions of key terms define fundamental aspects of cosmology and space-time motion upon which the universe is created. Secondary manifestations of terms describe how these primary principles manifest in the everyday world.<sup>16</sup> An important

clinical note is that in the *Nèijīng*, higher-level practice was seen to be based on a thorough understanding of the primary meanings of key terms, while lowerlevel clinical practice was believed to be based

on understanding only secondary meanings and outward physical manifestations.

Basic confusions regarding issues of terminology continue to pose significant challenges for the Chinese medical profession today. Lacking clear and mutually agreed definitions of basic terms, the ability to teach, conduct meaningful research and innovate are all significantly compromised. For these reasons, the investigation of the original meanings of basic terminology and principles remains a critical priority for the profession.

### C. The original meaning of shén

In Chinese medicine, the term 神 *shén* plays a critical role in theories of human health and illness, but as with other important terms, there is little agreement as to its actual definition. In current practice, the concept of *shén* is often associated with the idea of the human spirit—another concept that is difficult to define. In the *Nèijīng, shén* is

> one of the four primary forces of the universe that create and organise the cosmos. In this role, *shén* is described as a transcendent dimension of space-time in which the normal measurable rules of *yīn-yáng* motion do not

apply. *Shén* transforms from a hidden aspect of space-time into a special state of transcendent illumination in specific states where the *yīn* and *yáng* aspects of breath motion exist in a stable dynamic balance. In its illuminated state, *shén* manifests as *shén* illumination (神明 *shénmíng*). *Shén* and *shén* illumination are seen to be transcendent forces around which the natural world is organised and maintains its coherence. Accordingly, these forces are the basis for

In accordance with this interpretation, the anatomical spleen would have originally been considered a second, left-sided liver organ ...



The right-sided 肝 (gān) organ corresponds to the Western anatomical liver. It expresses the yīn aspect of the organ system.

The central axis 脾 (pí) organ corresponds to the Western anatomical pancreas (not to the spleen) The left-sided 肝 (*gān*) organ corresponds to the Western anatomical spleen. It expresses the *yáng* aspect of the organ system.

#### Figure 4. Nèijīng Text Archeology - The Liver and Spleen Organs

In a revised model of the internal zàng organ system, the  $FF(g\bar{a}n)$  organ (now the Chinese medicine liver) was likely originally a bilateral organ structure with both left- and right-sided organs, similar to the paired lungs and kidneys. In this revised context, the right-sided  $FF(g\bar{a}n)$  organ originally described a right-sided 'liver' organ, while the left sided  $FF(g\bar{a}n)$  organ (now the Chinese medicine spleen) originally described a second left-sided 'liver' organ. Furthermore, it is now believed that the PP(pi) organ (now the Chinese medicine spleen) originally referred to the anatomical pancreas, not the spleen.

all transcendent, spiritual and religious experiences in human life. In *Nèijīng* descriptions, *shén* illumination is seen to emerge spontaneously within the human heart and circulates through the body's three-dimensional vascular river system.<sup>17</sup> As originally described, *Nèijīng* acupuncture is a traditional form of surgery that reinstates the normal flow of *shén* illumination by restoring proper circulation to the body's three-dimensional vascular rivers. This restored circulation reestablishes the body's biological coherence and allows illnesses and symptoms to resolve naturally. For these reasons, in *Nèijīng* descriptions, *shén* and *shén* illumination are the critical forces that underlie all clinical therapeutics.

### D. The original meaning of wǔxíng

The concept of the five circulations (五行 wǔxíng) is important to many theories of Chinese medicine, although as with other important terms, definitions as to its actual meaning vary.<sup>18</sup> In Nèijing descriptions of the space-time order of the universe, the primary motive force of the cosmos resides in an inherent tendency for the universe to expand and contract continually, or, stated simply, to 'breathe.' In the Nèijing, the term for the expanding breath of the universe is yáng(陽), while the term for the reverting breath of the universe is yīn (陰). In these cosmic motions, the breath of the universe passes through different states of dimensional order that the Nèijing categorises by the use of numbers.<sup>19</sup> In this schema, the number five, as well as its auxiliary number four, are used to describe the dimensional order of the circular motions of the celestial heavens as they circumnavigate the northern pole star.<sup>20</sup> Other terms used to describe these turnings of the celestial heavens include: 五音 (wùyīn; the five celestial tones), 五氣

( $w\check{u}qi$ ; the five celestial qi), 五位 ( $w\check{u}w\check{e}i$ ; the five celestial positions) and 五運 ( $w\check{u}y\check{u}n$ ; the five celestial rotations).<sup>21</sup> As a primary definition, the term five circulations (五 行  $w\check{u}xing$ ) originally referred to the governing forces of the celestial heavens that descend to earth to guide the cycles of the seasonal patterns of nature. In regard to its secondary manifestations, the term  $w\check{u}xing$  then became associated with the earth-based patterns of motion seen in the physical expressions of nature in the images of growing wood (ascending and expanding), fire (terminal ascent and expansion), earth (central pivoting), metal (descending and contraction).

# E. The original meaning of the liver and spleen organs

In Chinese medicine, correlations between traditional descriptions of anatomy and physiology and more contemporary descriptions are commonly made. In this regard, it is important to note that while early Chinese physicians and their later Western counterparts observed the same anatomical features, the ways in which these observations were understood and organised were typically quite different. For example, while both early Chinese physicians and their later Western counterparts observed the anatomical heart, their understandings as to the nature and function of this organ differ widely. In the Nèijing, the heart organ is seen to be the anatomical and functional home of the southern directional aspects of the body, as well as the imperial ruler, conveying biological coherence through the timing of the heart rhythm and the circulation of shén illumination through the three-dimensional vascular system.<sup>22</sup> In contrast, Western physicians view the heart primarily as a mechanical pump that functions solely to circulate the blood.23

Current Chinese medicine texts typically favour modern descriptions of anatomy and physiology over the descriptions found in original texts. An example can be seen in the descriptions of the liver and spleen organs. In contemporary Chinese medicine, the organ signified by the character (*gān* - now the Chinese medicine liver) correlates closely with Western descriptions of the anatomical liver, while the organ signified by the character 脾 (pi - now the Chinese medicine spleen) correlates closely with Western descriptions of the anatomical spleen. However, Nèijing text research suggests that the original descriptions of the liver and spleen organs likely differed from current understandings in important ways. Specifically, that the character  $\mathbb{H}(g\bar{a}n)$  originally described a bilateral organ system with both left- and right-sided organs, and that the character 脾 (pi) originally referred to the anatomical pancreas and not to the spleen. In accordance with this interpretation, the anatomical spleen would have originally been considered a second, left-sided liver organ (figure 4). These research conclusions are based on eight principle findings: (1) the nature of classical Chinese grammar; (2) *Nèijīng* models of anatomical symmetry; (3) the bilateral trajectories of vascular rivers and channel graining patterns; (4) the described anatomical orientation of the body; (5) traditional concepts of the meaning of the centre direction; (6) descriptions of the back *shū* regions; (7) specificity of organ differentiation; and (8) specific anatomical and physiological text descriptions.

In the classical Chinese grammar used in the  $N \dot{e} i j \bar{i} n g$ , characters such as  $\mathbb{H}(g \bar{a} n)$  and  $\mathbb{H}(p i)$  do not distinguish between singular and plural case or left- and right-sided orientation. Thus, the character  $\mathbb{H}(g \bar{a} n)$ , can be translated equally as 'one liver' (singular), 'many livers' (plural), a 'left-sided liver', a 'right-sided liver' or a 'bilateral pair of livers'. Language use alone does not differentiate between these meanings. Further, there are no text passages in the  $N \dot{e} i j \bar{i} n g$  that clarify these issues of terminology.

The Nèijing describes the human body in terms of a reflected symmetrical architecture, in which the left and right sides of the body mirror one another, as do the upper and lower regions. This model is consistent with traditional *yīn-yáng* theory, in which the concept of reflected symmetry plays a central role. Thus, by default, descriptions of organ topography in the *Nèijīng* would be expected to give descriptions of paired organs that are bilaterally symmetrical, as is the case with the kidney and lung organs. An exception to this rule is found in the two centrally located organs: the heart, which sits at the centre of the vascular system, and the pancreas (the organ indicated by the character 脾 *pí* in the *Nèijīng*), which resides at the digestive centre of the body. In Nèijing anatomical descriptions, the body's channels and vascular rivers also exhibit this bilateral symmetry. Thus, if the body's organs were located unilaterally, on either the left or right side of the body, the channels and vascular rivers would be required to deviate significantly across midline structures and violate this organisation.24

In the *Nèijīng*, the anatomical position of the human body is portrayed as facing south, with the arms stretched above the head.<sup>25</sup> In this position, the frontal plane of the

body aligns with the diurnal passage of the sun across the southern sky. The energies associated with the sun ascend in the morning on the left side of the body (the eastern direction) and descend in the evening on the right side (the western direction). In this model, the external anatomy of the left side of the body is associated with the younger yáng



Figure 5. Nèijīng Text Archeology - Level of Zàng Organ Differentiation

In the Nèijing, the anatomical position of the human body is described as facing south, with the frontal plane of the body aligning with the the diurnal passage of the sun across the sky. Nèijīng principles of space-time theory predict that initial patterns of movement and form are less numerically differentiated and well-formed than later more established patterns. This anatomical organization is seen in the lungs. The left lung, being smaller in size and and having only two lobes, represents the earlier or 'younger' lung organ that is associated with the rising yáng energies of the eastern sky. In contrast, the right lung, being larger in size and having three lobes, represents a later or 'older' lung organ associated with the descending yin energies of the western sky. Similarly, the left-sided 肝 (gān) organ (now the Chinese medicine spleen), which lacks any lobes and is smaller in size, represents an earlier or 'younger' left-sided liver organ, while the larger, three-lobed right-sided 肝 (gān) organ (now the Chinese medicine liver) represents a later or 'older' right-sided liver organ. [Source: <https:// www.bartleby.com/107/138.html>]

qualities of the early day, and the external anatomy of the right side is associated with the older  $y\bar{i}n$  qualities of the later day.<sup>26</sup> This pattern also follows the annual procession of the seasons, with the body's energies rising on the left side

# Xué ground caves are located above or adjacent to deeper vascular rivers that flow beneath them.

of the body in springtime and descending on the right side of the body in the autumn.<sup>27</sup> In the body, the morning and springtime rising patterns of the eastern sky are associated

with the  $\mathbb{H}(g\bar{a}n)$  liver organ network.<sup>28,29</sup> Thus, it would be expected that the rising energies of the eastern direction would be seen in the anatomy of the left side of the body in the form of a left-sided liver organ (the organ now described as the anatomical spleen).

Additionally, Nèijing space-time theory describes initial



Figure 6. Nèijīng Text Archeology - Graining Patterns

The human body is formed from the same intangible patterns of spacetime motion that create and govern the natural world. In both nature and the human body, the material aspects of form have spaces or grains that facilitate the flow of these patterns of motion. In the body, tissue graining patterns that run parallel to the axial center are called *jing* (經) channel patterns, while tissue graining patterns that pass perpendicularly between the axial center and the periphery are called *luò* (絡) collateral patterns. Similar to water that flows within graining patterns of the earth to form rivers, blood flowing within specific tissue-plane grains creates the body's blood rivers. In the Nè*jing* these blood rivers are called *mà* (脈). Nè*jjing* descriptions of the mài (脈) blood rivers are the original source of the acupuncture channel system. [Image from iStock images.]

patterns of movement and form as being less numerically differentiated than later, more established patterns.<sup>30</sup> This theoretical construct correlates with the anatomical description of the lungs: the left lung, which is smaller in size and and has two lobes, represents an earlier or 'younger' lung organ associated with the eastern rising *yáng* energies, while the right lung, which is larger in size and has three lobes, represents a later or 'older' lung organ associated with the western descending *yīn energies* (figure 5). Similarly, the anatomical spleen, lacking any lobes and being smaller in stature than the three-lobed anatomical liver, represents an early or 'younger' *yáng* liver organ, while the right-sided liver represents a later or 'older' *yīn* liver organ.<sup>31</sup>

In *Nèijīng* descriptions, the 脾 (pi) organ closely resembles the anatomical pancreas. This organ is described as occupying the anatomical and physiological centre of the body and is closely associated with the stomach organ and processes of digestion. In contrast, in current descriptions in Chinese medicine, the pi organ is associated with the spleen, an organ that is located unilaterally on the left side of the body and does not play a role in digestion in current understandings. In contrast, the anatomical spleen is a highly vascularised organ that closely resembles the structure of the liver organ, and in modern understandings,

similarly to the liver, is associated with the processes of blood metabolism.

In early Chinese texts, the centre direction is a critical axis around which the processes of life turn. Similar to the central opening that exists at the hub of a wheel, the centre is an implied direction that is created and maintained by the smooth circulations and rotations that surround it. Like the hub of a wheel, although small, this direction plays a critical role. For these reasons, in traditional descriptions, an organ associated with the centre direction should occupy the anatomical centre of the body and not be situated to one side. These criteria are met by the stomach and pancreas organs but not by the left-sided spleen organ. Additionally, the *Nèijīng* describes the stomach and 脾 (pi) organ as being separated by an anatomical membrane, a detail that correlates with the retroperitoneal position of the pancreas, but not to the spleen.<sup>32</sup> In descriptions of the specialised back shū areas that overlie and communicate with the internal organs, the back  $sh\bar{u}$  area associated of the back, while the back  $sh\bar{u}$  area associated with the 脾 (pi) organ is located on the opposite right side of the back, a position that corresponds closely to the location of the head of the pancreas.<sup>33</sup> Taken as a whole, these findings suggest that the (*gān*) liver organ system was originally seen to be a bilateral organ system comprised of two organs that currently correspond to the anatomical liver and spleen; furthermore, that the 脾 (pi) organ originally referred to the anatomical pancreas and not to the spleen, the organ currently associated this term. Based on these findings, it is suggested that Chinese medical terminology should be updated to reflect these observations.

# F. The original meaning of the acupuncture channel system

In the *Nèijīng*, the human body is described as a complex ecological system that is created from the same principles and patterns that create and organise the natural world. This natural ecology is described in terms of a hydrological system that is organised around a complex network of vascular rivers and waterways.<sup>34</sup> In this model, the blood vessels of the body are seen as rivers that carry blood—which itself is seen as a specialised form of 'red water'.<sup>35</sup> The body's vascular rivers flow along axial and radial tissue graining patterns that arise from intangible aspects of space-time motion present in the environment at the time of the body's initial conception and creation. Tissue-graining patterns that run parallel to the axial centre of the body are termed *jīng* (經) channel patterns, while tissue-graining patterns that pass perpendicularly



Figure 7. Nèijīng Text Archeology - Anatomical correlations of the Three Burners (三焦(sānjiāo)

In the Nèijīng, the three burners ( $\equiv \pm s\bar{a}nji\bar{a}o$ ) are anatomical structures that join the digestive tract and structures associated with the metabolic processes of digestion to the primary vascular rivers ( $\pm m\dot{a}i$ ) and water pathways ( $\times \pm shu\bar{a}d\dot{a}o$ ) of the body. By absorbing the fermenting products of digestion, the three burners are the primary source of warmth for the body. At their origins at the digestive tract, the three burners ( $\pm s\bar{a}nji\bar{a}o$ ) bear a close resemblance to the primary embryological and anatomical vascular structures of the abdomen: the celiac, superior, and inferior mesenteric arteries. [Source: <a href="https://www.bartleby.com/107/illus985.html">https://www.bartleby.com/107/illus985.html</a>]

between the axial centre and the periphery are called *luò* (絡) collateral patterns.<sup>36</sup> Tissue-graining patterns that surround the body's blood rivers are called *mài* (脈) (figure 6).<sup>37</sup> The original *Nèijīng* description of the body's three-dimensional *mài* river circulation later became the basis of the current acupuncture channel system.

The topography of the body's tissue graining patterns and vascular rivers are organised around six primary axial watershed regions, with each watershed having an upper and lower course. Thus, there are twelve watersheds in total.<sup>38</sup> Each anatomical watershed is defined by the course of a primary axial mài river, and each of the twelve watersheds is correlated with an important watershed region of ancient China.<sup>39</sup> Nèijīng acupuncture is a form of traditional surgery that uses the ancient nine needles to regulate the body's rivers and waterways by resolving tissue-plane pathologies that impede circulation. For these reasons, the end goal of all Nèijing interventions is to normalise the flow of blood. Following the Hàn dynasty, the model of vascular rivers and channel graining patterns was replaced by practices that emphasise acupuncture point action, describing acupuncture channels more as topographical lines on which acupuncture points are located.

### G. The original meaning of acupuncture points

Nèijing acupuncture focuses primarily on the proper flow of vascular rivers and not on specific acupuncture points. However, this does not mean that idea of acupuncture points was not important in Nèijing practice, but rather that they were conceptualised and used in different ways. In the *Nèijīng*, the term used to describe acupuncture points is 穴 (xué). This character translates literally as 'ground cave'. In the Nèijing descriptions of hydrological ecology, ground caves are important features of the body's landscape. In the body, xué ground caves are located above or adjacent to deeper vascular rivers that flow beneath them. By forming subterranean passageways down to the rivers below, these caves create surface depressions and potential spaces beneath the skin.<sup>40</sup> In the Nèijīng, the primary clinical use of xué ground caves is to access the qi of the rivers that flow beneath them.<sup>41</sup> In the ecological paradigm of the Nèijing, most ground caves do not possess special actions apart from their functions as passageways; however, a subset of ground caves also possess the unique ability to exert special influence on regions or processes at a distance from the ground cave itself. These specialized xué are called shū (communicating) areas.<sup>42</sup> In the Nèijing, xué ground caves are named according to the regional features in which they are located.43 In Nèijing descriptions, neither generic xué ground caves nor secondary shū communicating regions are understood to be discrete acupuncture points, as described in Chinese medicine.

#### H. The original meaning of the běnshū areas

In the  $N\dot{e}ij\bar{n}g$ , a special collection of  $sh\bar{u}$  communicating areas is characterised by the term  $\Delta \hat{m}$  ( $b\check{e}nsh\bar{u}$ )—literally 'root  $sh\bar{u}$ '.<sup>44</sup> These  $sh\bar{u}$  areas are found on both the upper and lower extremities distal to the knees and elbows and have the important ability to influence the specific seasonal directional qualities of their internal  $z\grave{a}ng$  organs.<sup>45</sup> On each  $y\bar{i}n$  river watershed, there are five root  $sh\bar{u}$  areas, each corresponding to one aspect of the seasonal motion patterns within its respective organ. In  $y\acute{a}ng$  river watersheds, an extra sixth  $sh\bar{u}$  ground cave is added to correlate with basic  $N\dot{e}ij\bar{i}ng$  principles of space-time theory.<sup>46</sup>

In regard to the seasonal order of the *běnshū* regions, on both  $y\bar{i}n$  and  $y\acute{a}ng$  watersheds, the most distal  $sh\bar{u}$  areas correspond with the winter (i.e., northern) aspect of the associated internal organ. The next proximal  $sh\bar{u}$  area resonates with the springtime (i.e., eastern) aspect of the associated organ. The next proximal  $sh\bar{u}$  area resonates with the summer (i.e., southern) aspect of the associated internal organ and the most proximal  $sh\bar{u}$  area resonates with the autumn (i.e., western) aspect of the associated internal organ. Later texts that present a different sequence to this order, describing the order on  $y\bar{i}n$  watersheds as being a



Figure 8. Nèijīng Text Archeology - The Heart Collateral System

In the Nèijīng, the heart is warmed and nourished by a vascular system that correlates closely to current descriptions of the coronary arteries. A variety of terms are used to describe this system, including the heart-ruling (network) "心主" (xīnzhǐ), the heart-wrapper "心包" (xīnbāo), the heart-wrapping collateral "心包絡" (xīnbāoluò), and the mài river of the heart-wrapping collateral "心包絡之脈" (xīnbāoluòzhīmài). No evidence exists that relates these structures to the anatomical pericardium, and thus it is recommended that use of the term "pericardium" be discontinued and that the terms "心主" (xīnzhǐ), "心包" (xīnbāo), and "心包絡之脈" (xīnbāoluòzhīmài) be considered references to the heart collateral network. [Image from iStock images]

progression that begins distally with the wood (i.e., eastern) phase and on *yáng* watersheds as beginning distally with the metal (i.e., western) phase, now appear incorrect and are not supported by the original text descriptions found in the *Nèijīng* or *Nèijīng* theory.<sup>47,48</sup> It is therefore recommended that current terminology and practice be updated to reflect these changes.

### I. The original meaning of the sānjiāo system

As with other terms in Chinese medicine, the term 三焦 (sānjiāo) has developed a variety of meanings. However, in the Nèijing, the anatomy and physiology of this system are described in detail. In the original descriptions, the sānjiāo is an anatomical structure that joins the processes of digestion to the vascular rivers and water passageways of the body.<sup>49</sup> One of its primary functions is to aid in the separation and assimilation of food and liquids to warm and nourish the body.<sup>50</sup> The sānjiāo is comprised of definite anatomical features, with two upper-burner structures originating at the level of the stomach organ and a third lower-burner structure likely originating near the junction of the small intestine and ascending colon.51 These structures form a network that merges with the vascular rivers and pathways of the body to provide warmth and nutrients. The sānjiāo has an intimate relationship with the collateral system of the heart (see below) and has a special role in warming and nourishing the heart. The *sānjiāo* system therefore correlates closely to descriptions of the primary vascular features of the abdomen and digestive tract (figure 7).

# J. The original meaning of the heart collateral network

In *Nèijīng* descriptions, the heart organ is warmed and nourished through a collateral network that is closely associated with the digestive system through the *sānjiāo* system (see above). The heart collateral network is described using a variety of terms, including heart-ruling (system) (心主, *xīnzhǔ*), heart-wrapper (心包, *xīnbāo*), heart-wrapping collateral (心包絡, *xīnbāoluò*) and *mài* river of the heart-wrapping collateral (心包絡之脈, *xīnbāoluòzhīmài*).<sup>52</sup> Based on *Nèijīng* text descriptions, the heart collateral network correlates closely with current descriptions of the coronary arteries (figure 8). No *Nèijīng* text sources exist to support the idea that these terms refer to the anatomical pericardium; therefore, it is recommended that use of the term pericardium be discontinued in favour of the term 'heart collateral network'.<sup>53</sup>

# V. Summary

Over the past 20 years, new research techniques have been developed to analyse early Chinese medical texts. This research has uncovered many new ideas about the original theories and practices of Chinese medicine. These findings have the potential to change the practice of Chinese medicine in fundamental and paradigm-shifting ways, making our current time one of the most important and influential historical periods in the development of Chinese medicine. However, by their nature, these ideas are also inherently disruptive and will require a re-evaluation of many current practices and theories. Further research is likely to uncover even more new ideas and approaches that have the potential to invigorate and nourish the practice of Chinese medicine for years to come.

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#### Endnotes

- In its current form, the Nèijing consists of two basic texts, The Yellow Emperor's Inner Classic: Plain Questions (黃帝內經素 Huángdì nèijing sùwèn) and The Yellow Emperor's Inner Classic: Divine Pivot ( 黃帝內經靈樞 Huángdì nèijing língshū). In this article, these texts will be referred to collectively as the Nèijing.
- 2. Thus, it is not the use of acupuncture needles or Chinese herbs alone that defines a specific clinical practice as residing within the tradition of Chinese medicine; rather, it is the theoretical basis upon which these techniques are practised and understood that places them within this tradition.
- Important writings of early China such as the Way of Virtue (道德經 Dào dé jīng), the Confucian Analects (論語 Lùn y) and the Classic of Change (易經 Yì jīng) were believed to contain critical cultural and scientific knowledge. As such, while efforts were made to edit and clarify these texts, their key concepts and language were likely preserved.
- 4. Specifically, text-based archeology approaches text information with as few pre-existing assumptions as possible, letting the words and characters speak for themselves and define their own meaning. In this model, any conclusions may be questioned and refined at any time. In contrast, traditional lineage-based systems tend to preserve an orthodox point of view that is not typically subject to the same type of questioning.
- Holographic text translation refers to the process of identifying research definitions and points of view that remain valid and consistent across all instances within the source text.
- 6. For example, silk manuscripts discovered at the M wángduī archeological site dating from 168 BCE fail to mention the Nèijīng. While current archeological data supports the view that the Nèijīng was written after the Hàn dynasty, it is important to note that much archeological information still remains to be excavated and analysed. There is still much to be discovered.
- 7. The Hundred Schools of Philosophy (諸子白家 Zhūzǐ báijiā) refers to the core intellectual traditions and writings of Chinese culture that arose during the mid- and later Zhōu Dynasty (1046–256 BCE). During this time, thinkers such L ozǐ (老子; 6th century BCE), K ng Fūzī (Confucius) (孔夫子; 551-479 BCE), Mòzǐ (墨子; 470-391 BCE) and Zhuāngzǐ (莊子; 4th century BCE) all established their philosophical traditions.
- 8. The Jixià Gate Academy (稷下學宮 ji xià xué gōng) was founded in the later part of the 4th century BCE in the state of Qí as an attempt by its rulers to increase their political prestige and influence. During its time, various teachers and scholars taught and received imperial patronage. Zōuy n (鄒衍; 305–240 BCE) was the primary teacher of the Yīn-Yáng School of nature-based philosophy.
- 9. The Nèijing is a text based on scientific observations of the natural world. Conspicuously absent in its writings are references to deities, ancestral spirits or other supernatural forces. Thus it is recognised as one of the first extant texts on natural sciences in human history.
- 10. Evidence for this can be seen in the different writing styles and language used, as well as the different naming conventions employed to describe similar types of techniques and practices.
- 11. For example, many descriptions of complex vascular and musculoskeletal anatomy and function in the Nèijīng.
- 12. Descriptions of the Hàn dynasty physician Chúnyú yì (淳于意) do exist. However, these records describe a rudimentary understanding of anatomy and medical practice in comparison with descriptions given in the Nèijīng text. To the author's knowledge, following the Qín dynasty, no other texts survive that describe physicians practicing traditional acupuncture surgery with the Nine Needles, based on the model of vascular rivers.
- 13. See Neal, E. (2012). Introduction to Neijing Classical Acupuncture

Part I: History and Basic Principles, Journal of Chinese Medicine, (100), 5-14

- 14. Throughout human history, major medical advances have occurred during times of war. This was also likely the situation in the Warring States period.
- 15. In 26 BCE, the Hàn emperor Chéngdì commissioned an inventory of the imperial library. A catalog based on this inventory contains a section called the Seven Summaries (七略 qī lüè). This lists medical texts, including the first description of a document believed to be associated with the Nèijīng. For further reading, see Unschuld, P. (2003). Huang di nei jing su wen: nature, knowledge, imagery in an ancient Chinese medical text. University of California Press.
- 16. For example, the primary definition of the term yáng (陽) relates to its role as the expanding aspect of the breath of the cosmos. Secondary manifestations for this term then describe how this force manifests in the world as heat or masculine attributes.
- 17. Sùwèn 8: 心者君主之官也神明出焉 [The] heart is [the] sovereign [and] ruling official; shén illumination (shénmíng) emanates [here].
- 18. For example, this term is often incorrectly translated as the 'five elements' and is associated with the material forms of wood, fire, earth, metal and water.
- 19. In our research, the term that has been developed to describe this phenomena is 'directional shifting.'
- 20. The dimensional number five is used to describe the four directions of the constellations as they turn around the northern pole star, with the sky bisected into four quadrants with a pivoting axis at the center of rotation. At times, an auxiliary number four is also used to describe this motion—in these cases the center axis point is implied but omitted.
- 21. In the Nèijīng, the term five celestial tones (五音 w yīn) refers to the patterns of musical resonance created by the constellations, the term five celestial qì (五氣 w qì) refers to the type of qì created by the constellations, the term five celestial positions (五位 (w wèi) refers to the ruling positions of the constellations in the sky, and the term five celestial rotations (五運 w yùn) refers to the turnings of the constellations around the northern pole star.
- 22.The southern direction aspect of the body refers to the various anatomical and physiological features and processes that form around the terminal expanding phase of the *yīn-yáng* breath (e.g. the heart, small intestine, blood vessels, tongue).
- 23. In the Nèijīng, it is the lungs, not the heart, that are understood to be the primary mover of the blood; in contrast, the essential duty of the heart lies in its role as imperial ruler, governing the body through the processes of the heartbeat and shén illumination.
- 24. The vascular rivers and graining channels that form the basis of the acupuncture channel system form bilateral pathways that are reflected on both the left and right sides of the body. As a general rule, these pathways do not cross the midline to their opposite sides.
- 25. Sùwèn ó. 聖人南面而立前曰廣明後曰太衝 [The] sage stands facing [the] south; [in] front [of them is] called spreading illumination; behind [them is] called great rushing.
- 26. In accordance with basic yīn-yáng theory, this order is reversed in the deep interior kidney organs. Here, the right-sided kidney represents the yáng kidney while the left-sided kidney represents the yīn kidney.
- 27. LS78. 左足應立春其日戊寅己丑左脅應春分其日乙卯左手應 立夏其日戊辰己巳膺喉首頭應夏至其日丙午 右手應立秋 其日戊申己未 右脅應秋分其日辛酉 右足應立冬其日戊戌 己亥腰尻下竅應冬至其日壬子 [The] left foot corresponds [with the] beginning [of] spring; its days [are] wù yín, jĩ, [and] ch u. [The] left rib-side corresponds [with the] spring equinox; its days [are] yǐ [and] m o. [The] left hand corresponds [with the] beginning [of] summer; its days [are] wù, chén, jĩ, [and] sù. [The] breast, throat, head, [and] neck correspond [with the] summer solstice; their days [are] bǐng [and] w . [The] right hand corresponds [with the] beginning [of] autumn; its days [are] wù, shēn, jĩ, [and] wèi. [The] right rib-side corresponds [with the] autumn equinox; its days [are] xīn [and] y u. [The] right foot corresponds [with the] beginning [of] winter; its days [are] wù, xī, jĩ, [and] hài. [The] waist, buttocks, [and] lower openings correspond [with the] winter solstice; their days [are] rến [and] zĭ.
- 28.Sùwèn 4. 東方青色入通於肝開竅於目藏精於肝 [The] eastern

direction [corresponds with the] color blue-green (qīng). [lt] enters [to] communicate [with the] livers (gān). [lt] opens through [the] eyes]. [lt] stores [its] essence (jīng) within [the] liver.

- 29. Sùwèn 52. 肝生於左肺藏於右 [The] livers (gān) birth on [the] left, [the] lungs (fèi) store [on the] right.
- 30. In Nèijing space-time theory, the process of dimensional shifting progresses through unary (1), binary (2), tertiary (3), quaternary (4), quinary (5), and senary (6) dimension. In this framework, earlier patterns are less numerically differentiated, while later patterns have a higher-order numerical order.
- 31. The left 肝 (gān) organ (i.e., the anatomical spleen) is smaller in stature and less well-differentiated than the right-sided 肝 (gān) organ (i.e., the anatomical liver). On the left side of the body the rising function of the 肝 (gān) organs is assisted by the ascending energies of the eastern sky. In contrast, on the right side, the body has to counter the descending energies of the western sky. Thus, the right-sided liver organ is larger to compensate for these patterns.
- 32. Sùwèn 29. 脾與胃以膜相連耳而能為之行其津液何也歧 [The] pancreas (pí) [and] stomach [organs are] mutually joined [at their] sides [by a] membrane (mó). [Through this membrane, they are] able [to] merge [the] circulations [of their] thin [and] thick fluids.
- 33. Sùwèn 24. 復下一度左角肝之俞也右角脾之俞也 [Moving] down once again, [at the] left corner [of the back is the] gān shū [region]. [At the] right corner [of the back is the] pí shū [region]. In these descriptions, the left-sided gān shū region overlies the anatomical spleen and the right-sided pí shū region overlies the head of the pancreas.
- 34. This model is consistent with the critical role that rivers played in early China as well as early scientific observations of the circulatory patterns of nature, which were believed to be embodied by the circulatory patterns of water.
- 35. In the body, as in nature, many different types of water exist; each has different qualities and roles. In the Nèijīng descriptions, blood is a special form of water that is infused with the 'red' or southern direction aspects of ingested food and liquids.
- 36. In the Nèijīng, graining patterns are called 理 lī. These axial and radial patterns of tissue graining are the basis for the acupuncture channel system.
- 37. In the body, fluids circulate in both channel graining patterns and within recognized blood vessels. When they flow within recognized blood vessels, they are called blood rivers (脈 mài).
- 38. The body has six primary watersheds, each having an upper and lower course, thus creating twelve watersheds in total. These twelve watersheds are: the upper and lower greater yīn (太陰 tàiyīn) watersheds; the upper and lower yáng illumination (陽明 yángmíng) watersheds; the upper and lower lesser yīn (少陰 sh oyīn) watersheds; the upper and lower greater yáng (太陽 tàiyáng) watersheds; the upper and lower lesser yáng (少陽 sh oyáng) watersheds; and the upper and lower lesser yín (厥陰 juéyīn) watersheds.
- 39. For example, the upper greater yīn (太陰 tàiyīn) watershed is correlated with the Yellow River watershed, and the upper yáng illumination (陽明 yángmíng) watershed is correlated with the Yangzi River watershed.
- 40. Surface skin depressions are similar to geological areas found in nature where the soil has thinned away over an underlying river or body of water prior to the formation of a sinkhole.
- 41. This is reflected in the language used to describe the relation between ground caves and their underlying vascular rivers. For example: Sùwèn 59. 手陽明脈氣所發者二十二穴 [The] qì [of the] hand yáng illumination (yángmíng) blood river (mài) emerges from twenty ground caves (xué).
- 42.Ēxamples of specialized shū communicating areas include the root organ shū (本輸 běnshū) communicating regions, the back shū (背 輸 bèishū) communicating regions, the water shū (水輸 shuĭshū) communicating regions, and the heat shū (熱輸 rèshū) communicating regions.
- 43.For example, Yin Mound Spring (陰之陵泉 yinzhilíngquán) current name for SP-9; Front Valley (前谷 qiángǔ) - current name for SI-2; and Ravine Stream (俠谿 xiáxī) - current name for GB-43.

- 44. These regions are also known as the command, transport, or antique points.
- 45. In Nèijīng space-time theory, terrestrial motions are described using seasonal and directional terms. Seasonal and directional aspects of the internal zàng organs thus refer to different aspects of breath motion found within the organs. In this paradigm, winter and the northern direction refer to the terminal contracting aspects of breath motion, springtime and the eastern direction refer to the ascending and expanding aspects of breath motion, summer and the southern direction refer to the terminal expanding aspects of breath motion, summer and the southern direction refer to the terminal expanding aspects of breath motion, long-summer and the center direction refer to the central pivoting aspect of breath motion, and autumn and the western direction refer to the descending and contracting aspects of breath motion.
- 46. In Nèijing space-time theory, the inner (yin) layers of the body follow a fifth-level dimensional order, while the outer (yáng) follow a sixthlevel dimensional order. The běnshū regions are likewise organized to follow this order.
- 47.LS44. 黃帝曰以主五輸奈何藏主冬色主春春刺滎時主夏味 主秋秋刺合 [The] Yellow Emperor said, "How [do the] five [běn]shū [regions] govern [the five internal] zàng organs]?" [Qíbó replied,] "[The internal] zàng [organs] rule [the] winter; [in] winter, prick [the] jing [well regions]. Colors rule [the] springtime; [in] springtime, prick [the] yíng [stream regions]. Seasonal [expressions] rule [the] summer; [in] summertime, prick [the] shū[communicating regions]. Sounds rule [the] long-summer; [in] long-summer, prick [the] jing [channel regions]. Flavors rule the autumn; [in] autumn, prick [the] hé [merging regions].
- Specifically, these ideas appear to be built on mistaken descriptions within the Nánjing.
- 49.That the sānjiāo has at least a partially vascular structure can be inferred from its primary connections to other vascular rivers of the body.
- 50. In Nèijīng descriptions, ingested food and liquids are the primary source that provides warmth to the body.
- 51.LS18. 黃帝曰願聞三焦之所出歧伯荅曰上焦出于胃上口並 咽以上貫膈而布胸中 走腋循太陰之分而行還至陽明...黃帝 曰願聞中焦之所出歧伯荅曰中焦亦並胃中出上焦之後此所 受氣者泌糟粕蒸津液化其精微上注于肺脈乃化而為血以奉 生身...黃帝曰願聞下焦之所出歧伯荅曰下焦者別迴腸注于 膀胱而滲入焉 [The] Yellow Emperor said, "[I] wish [to] hear [from where the] three burners emerge." Qíbó answered, saying, "[The] upper burner emerges [at the] upper [level of the] stomach [near the stomach] mouth. [It then] joins [with the] esophagus to ascend through [the] diaphragm [and] spreads [through the] chest center. [It then] goes [to the] axilla [where it] follows [the] divisions [of the upper] tàiyīn [pathway and] circulates [to] return [and] arrive [at the upper] yángmíng [pathway]..." [The] Yellow Emperor said, "[I] wish [to] hear [from where the] middle burner emerges." Qíbó answered, saying, "[The] middle burner also emerges at [the level of the] stomach [near its] middle. Emerging behind [the] upper burner, [it] receives [the] qì. [It excretes the] fermented dregs [and] steams [the] thin [and] thick fluids [in order to] transform [their] subtle essence. Ascending, [it] pours into [the] lung mài [blood river] [and by these] transformations [creates the] blood [that] nourishes [the] body ... " [The] Yellow Emperor said, "[I] wish [to] hear [where the] lower burner emerges." Qíbó answered, saying, "[The] lower burner divides [where the] intestines turn back. [It] pours into [the] bladder and then seeps within."
- 52.The heart-ruling (network) "心主" (xīnzh) refers to the collateral network as a whole, the heart-wrapper "心包" (xīnbāo) refers to the collateral graining pattern in which the coronary arteries flow, and the mài of the heart-wrapping collateral "心包絡之脈" (xīnbāoluòzhīmài) refers to the associated mài river that joins to the collateral system surrounding the heart and flows down the arm into the palm.
- 53.Additionally, there are theoretical reasons why the term pericardium is inaccurate. Specifically, in the Nèijīng, the heart collateral network is an integral part of a larger vascular network. This finding excludes the anatomical pericardium, a structure that instead would more likely be understood to be a structural membrane (膜 mó) in early Chinese thinking.