

## Lecture Series

**Chinese Medicine: A Cognitive and Epistemological Review\***

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In spite of the common belief that Chinese natural philosophy and medicine have a unique frame of reference completely foreign to the West, this article argues that they in fact have significant cognitive and epistemic similarities with certain esoteric health beliefs of pre-Christian Europe. From the standpoint of Cognitive Science, Chinese Medicine appears as a proto-scientific system of health observances and practices based on a symptomological classification of disease using two elementary dynamical-processes pattern categorization schemas: a hierarchical and combinatorial inhibiting–activating model (Yin-Yang), and a non-hierarchical and associative five-parameter semantic network (5-Elements/Agents). The concept-map of the five-parameter model amounts to a pentagram, a commonly found geomantic and spell casting sigil in a number of pre-Christian health and safety beliefs in Europe, to include the Pythagorean cult of *Hygieia*, and the Old Religion of Northern Europe. This non-hierarchical pattern-recognition archetype/prototype was hypothetically added to the pre-existing hierarchical one to form a hybrid nosology that can accommodate for a change in disease perceptions. The selection of five parameters rather than another number might be due to a numerological association between the integer five, the golden ratio, the geometry of the pentagram and the belief in health and wholeness arising from cosmic or divine harmony. In any case, this body of purely empirical knowledge is nowadays widely flourishing in the US and in Europe as an alternative to Western Medicine and with the claim of being a unique, independent and comprehensive medical system, when in reality it is structurally—and perhaps historically—related to the health and safety beliefs of pre-Christian Europe; and without the prospect for an epistemological rupture, it will remain built upon rudimentary cognitive modalities, ancient metaphysics, and a symptomological view of disease.

**Keywords:** 5-elements theory – empirical medicine – proto-science – sacred geometry – semantic networks – traditional chinese medicine

*‘The world is built upon the power of numbers.’*  
Pythagoras

**Introduction**

A certain type of empirical medicine called ‘Traditional Chinese Medicine’ or ‘Oriental Medicine’ is widely flourishing in the US and in Europe with the claim that

it presents a frame of reference ‘completely foreign to the West’ (Kaptchuk) (1). And for its exotic terminology, its peculiar diagnosis and its unconventional treatment modalities, Chinese Medicine is being perceived as such by the Western health-consumer. A cognitive-epistemic review, however, does not support this claim of originality and points to remarkable infrastructural similarities between Chinese Medicine and the once-prevalent pagan (Latin, *Paganus*, ‘from the country’) beliefs of well-being and safety in pre-Christian Europe. This resemblance has actually been the subject of a variety of comparative studies, which range from the hypothesis of ‘convergence’ (Lloyd), to that of ‘transmission,’ as argued by Paul Unschuld who, based on phonetic resemblances, maintains that the elusive Qí Bó, the main

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interlocutor in the Yellow Emperor’s Canon of Internal Medicine, might have been Hippocrates (2–7).

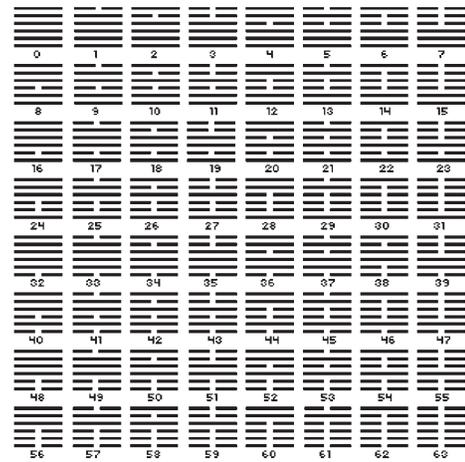
The intent of this article is to examine the fundamental archetypes/prototypes of pattern recognition and categorization in Chinese natural philosophy, and to point out that one of them is also found in the Pythagorean cult of *Hygieia* and in the health and safety beliefs of the Old Religion of Northern Europe. Common inheritance, convergence or transmission, this architectonic similarity—in any case—further supports Paul Unschuld’s view that ‘the notion of a vast dichotomy between Western and Chinese reactions to disease is completely unfounded’ (5).

**Conceptual Approaches**

This essay uses concepts from Cognitive Science, Continental Philosophy and Epistemology, and Discrete and Dynamical Systems Mathematics to deconstruct the infrastructure of Chinese medical thought, and to reveal its cognitive map and epistemic architecture. Historical suggestions that follow have the sole purpose of providing a stimulus for further discussion and research. The historical and philosophical sources are the English secondary literature by prominent Western sinologists. All Chinese terms are written in Pinyin and only Anglicized names of Chinese Classics are utilized. Romanized and Anglicized Greek words and Latin terms are in italics.

**The Chinese Models of Disease**

From the standpoint of knowledge architecture and representation, the core cognitive frame of reference in Chinese medical discourse is a combination of two key dynamical-processes pattern categorization schemas that seem to have been grafted together to form a hybrid system of thought. One emanates from ancient Chinese metaphysics that views ontogenesis (in the philosophical sense of the term) as the product of a wavering between an inhibiting and an activating force, called Yin and Yang, and symbolized by a broken (- -) and a solid (—) line, respectively. In this model, spatiotemporal events are assessed based on their dynamic state called ‘Qi’ (pronounced Ch’i), and plotted against a hierarchical and tree-like system similar to what is known as a ‘period-doubling bifurcation’ in Dynamical Systems Mathematics. For instance, at a second level of bifurcation, there are four possible qualitative outcomes in a dynamic event, such as in the course of a disease: Yang-Yang, Yang-Yin, Yin-Yang and Yin-Yin periods (8). According to the English secondary literature, one of the earliest references to this model is found in the I-Ching translated as the ‘Book of Changes’ or the ‘Classic of Changes,’ in which 2<sup>6</sup>, or 64, topologies/combinatorics of Yin and Yang called ‘Hexagrams’



**Figure 1.** The I-Ching itemizes 64 combinatorics of Yin and Yang. Source: [www.theory.org/~strthrwr/retired/iching.html](http://www.theory.org/~strthrwr/retired/iching.html).

(Fig. 1) are itemized and described, seemingly for the purpose of cleromancy and divination.

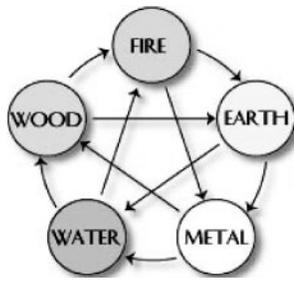
As for the epistemological merits of using a hierarchical inhibiting-activating model to conceptualize biological processes, Weiss, Qu and Garfinkel of University of California point out that it can only constitute a ‘minimal model,’ with limited abilities to directly relate its predictions to nature’s dynamical and emergent behavior, and that often biological events do not have explicit counterparts in it. Although their general assessment is not based on Chinese thought but on Alan Turing’s purely mathematical model as described in his 1952 article ‘The Chemical Basis of Morphogenesis,’ it could nonetheless be applied to the Yin-Yang model, given that these empirical notions appear as being analogous to Turing’s ‘short-range activating’ and ‘long-range inhibiting’ forces, and that within their contexts, both binary models seem to have the same epistemological limitations for their use of the minimum number of parameters needed to represent the dynamical nature of biological events (9).

The other key categorization schema, also known as the 5-Elements/Agents or 5-Phases/Stages theory, is a non-linear syntactic (or structural) pattern recognition construct, which is known in Cognitive Science as an ‘associative multiparameter’ or a ‘Hopfield-style’ network. This type of cognitive organization consists of a set of essential parameters (variables/nodes) and a lattice of dependency-relationships (vector/arcs) that fully inter-link them. This architecture seems to mirror the neural correlates of Hebbian learning. In the context of Chinese ancient metaphysics, the parameters are established by a ‘five-fold’ (Unschuld) discretization of all possibilities in every ontological domain into five mutually-exclusive variables, or paradigms, traditionally called Water, Wood, Fire, Earth and Metal (Table 1). Each parameter is attributed a finite number of potential states ranging from ‘deficiency’ to ‘excess,’ where events could be

**Table 1.** The Chinese five-fold discretization and dependency-relationships

Element	Water	Wood	Fire	Earth	Metal
Direction	North	East	South	Centre	West
Planet	Mercury	Jupiter	Mars	Saturn	Venus
Seasons	Winter	Spring	Summer	Late Summer	Autumn
Color	Black	Green	Red	Yellow	White
Tastes	Salty	Sour	Bitter	Sweet	Acrid
Emotion	Fear	Anger	Joy	Pensive	Grief
Yang Organ	Urinary Bladder	Gallbladder	Small intestine	Stomach	Large intestine
Yin Organ	Kidney	Liver	Heart	Spleen	Lung
Sensory Organs	Ears	Eyes	Tongue	Mouth	Nose

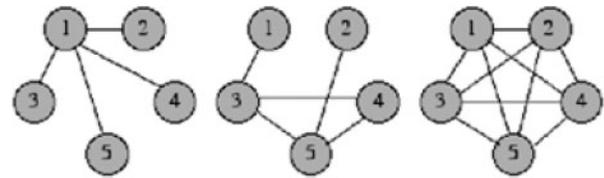
Sources: Hicks A *et al.* and Maciocia G. (17,18).



**Figure 2.** The concept map of the healthy Sheng and Ke cycles. Lines in the opposite direction form the unhealthy Cheng and Wu cycles. Source: Al Stone, Lung Cancer and Five Elements. [www.acupuncture.com](http://www.acupuncture.com). Reprinted with permission.

instantiated to. A system of cyclic vectors interlinks all variables by four series of ‘parental’ influences. There are two healthy series: the Generating (Sheng) and the Controlling (Ke) vectors, and two unhealthy ones, the Overacting (Cheng) and the Insulting (Wu) ones (Fig. 2). The pictogram of this semantic network amounts to a digraph (directed graph) with five nodes and ten vectors—a shape alike to a pentagram.

The cognitive value of this fully-connected semantic network resides in the fact that with sufficient training it can facilitate the quasi-mechanical structural recognition, classification and generalization of complex patterns based on the aggregation of variable-weights and relationship-strengths alone (9,10). Similar cognitive constructs are still widely used to design algorithms for machine learning and automated pattern recognition (11). Due to its non-hierarchical structure, this model can be used as a global inference model in a variety of situations where detailed information about a phenomenon is incomplete, conflicting and vague, or where a phenomenon is culturally attributed to the occult and the supernatural. This conceptualization schema is also used in ‘holistic sciences,’ such as in Systems Biology and in Systemic Medicine for the overall representation of complex non-linear biological phenomena where the whole is more than the algebraic sum of the parts and where analytical approaches have failed to predict



**Figure 3.** Hopfield-style networks are used in the context of Systems Biology. Source: Institute for Systems Biology. [www.systemsbiology.org](http://www.systemsbiology.org). Reprinted with permission.

nature’s complex, adaptive, and emergent behavior (Fig. 3) (12–15).

In the context of Chinese natural philosophy, this model is also paired with the ‘magick’ (exclusively meaning ‘paranormal’) belief in the existence of a second set of dependency-relationships between domains, where, by analogical reasoning, the manipulation of a variable in one domain is believed to cause changes in a parallel one (Table 1) (16).

Hence, by means of a multiparameter pattern recognition model, and with sufficient ‘supervised learning,’ a skilled folk healer can intuitively recognize a disease-pattern based on the instantiation of variable-weights (temperature, pulse and tongue conditions, etc.) and relationship-strengths (more pain than distention, less sweating than fever, etc.), and without any real knowledge of anatomy and physiology, or despite a lack of specific concepts and words for such a pattern (19). Then, he or she can treat the disease with an empirically-established remedy with actions attributed to the magick correspondences between domains. As for the use of five parameters instead of another number, it might be due to numerology and geomancy, such as the practice of Feng Shui (20). One might speculate that the notions of health and good fortune through sacred geometry and the divine or celestial harmony in terms of astrology, directions, location, the elements and proportions have determined its selection. The selection of five and the pentagram might also be related to the mathematical fact that the ratios of the lengths of the

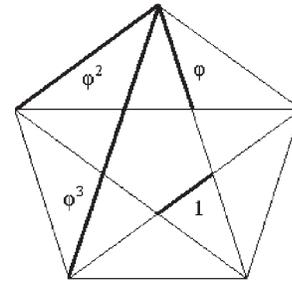
lines in a pentagram are all based on Phi ( $\Phi$ ), a ‘golden ratio’ close to 1.618, which also accounts for many ‘harmonious’ or ‘divine proportion’ found in nature (Fig. 4) (21,22).

Overall, it seems reasonable to relate Chinese natural philosophy and medicine to what Isaac Bonewits has termed ‘Meso-paganism,’ meaning a group of spiritual or sacred beliefs and practices of natural or polytheistic beliefs that have been significantly influenced by monotheistic, dualistic or non-theistic worldviews. This group includes a vast array of beliefs and practices ranging from the Native American and Australian Aborigine spiritualities to Freemasonry, Rosicrucianism and Theosophy (23,24).

### The Origins of the Pentagram

Paul Unschuld points out that the Yin-Yang model seems to be a purely Chinese construct; and that a ‘five-fold categorization of all phenomena’ seems to have been adopted at a later period (5). Further, Maciocia relates that the dualistic model dates back to the Western Zhou Dynasty (c.1000–711 BC), while the first recorded reference to the pentic model dates only back to the Warring States Period (476–221 BC) (18). It therefore seems reasonable to hypothesize that this late addition might have been the result of a cross-cultural exchange with the Mesopotamian or Hellenistic cultures. This suggestion relies on the fact that representations of a 5-pointed shape as a divine symbol date back to ancient Mesopotamia, where according to de Vogel it symbolized a ‘heavenly body’ (c.3500 BC). The same 5-pointed shape is found on Proto-Elamite tablets of the Susiana plain and the Iranian highlands east of the Tigris–Euphrates region where the pictogram signified the five directions: forward, backward, left, right and above, corresponding to the planets Jupiter, Mercury, Mars, Saturn, and Venus (3000–2500 BC) (Fig. 5) (25,26). This semantic association is comparable to the Chinese correlation between directions and planets (Table 1).

The pictogram is also found in Greece among the Pythagoreans and in the context of the cult of Hygieia, (*ὑγιεία*, *Salus* in Latin) the Greek patron of well-being, sanitation and the prevention of disease. The words ‘hygiene,’ ‘salute’ and ‘salvation’ originate from her name. *Hygieia* was the daughter of *Aesculapius* (*Ἀσκληπιός*), the God of medicine and healing, and the son of *Apollo* (*Ἀπόλλων* or *Ἀπέλλων*), the God of life-giving Sun. Coincidentally or not, the letters *υ-γ-ι-ει-α* in her name also correspond to the initial letters of the five Pythagorean elements (Fig. 6): *Hydor* (*ὕδωρ*, Water), *Gaia* (*γαῖα*, Earth), *Idea* (*ἰδέα*, Idea), *Heile* (*εἰλή*, Heat or Fire), and *Aer* (*ἀήρ*, Air). The Pythagorean brotherhood which resembled a mystical circle for its ascetic living and its cultivation of health and ‘divine blessing,’ combined *catharsis* (Latin from the Greek



**Figure 4.** The golden ratio, or Phi ( $\Phi$ ) in the pentagram’s geometry. Image based on a drawing by Steve Edwards of SPSU Math Department available at: [www.spsu.edu/math/edwards/main.html](http://www.spsu.edu/math/edwards/main.html). Drawing used with permission.



**Figure 5.** The pentagram in Proto-cuneiform text from Jemdet Nasr (3000–2500 BC). Source: Englund RK *et al.* (27).

*Κάθαρσις*, purification), numerology and geometric symbolism, and similarly, to the Chinese, believed in the existence of magick correlations between numbers, virtues, tastes, colors and sounds (25,28,29).

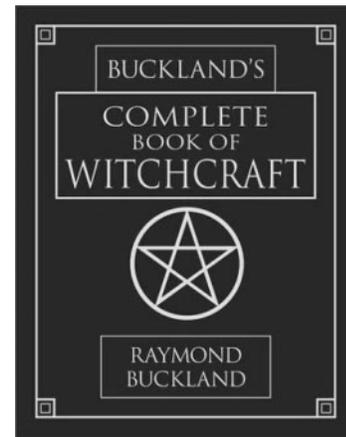


**Figure 6.** Pythagorean pentagram from Heinrich Cornelius Agrippa's 'Libri Tres de Occulta Philosophia' with the word *ὑγιεια* or *Hygieia*, Health, inscribed on its outer circle (30).

According to de Vogel, the pentagram was equally used as a talisman in the pre-Christian Northern Europe in the context of health, good fortune and the prevention of disease. Its use may have been associated with the Druids, but de Vogel does not attribute it to the Pythagorean influence. It rather seems to have been used in the context of spell casting, ritual magick and folk healing as a protection against evil and malevolence, and was sometimes worn as an amulet for happy homecoming (25). Today, a pentacle—a pentagram within a circle—remains a nostalgic symbol of Neo-pagan faiths such as the Reconstructionist and the Wiccan traditions. It is widely used in a number of rituals, and often worn as a symbol of recognition among the initiates of New Age witchcraft (Fig. 7). Even in urban shamanism, rave culture and other tribal/urban movements of the information age, the 'primitives' wear a pentacle talisman—possibly in defiance of Christianity—while they indulge in Chaos Magick and the sigil rituals of Pentagrammaton and Pentacle body-piercing (31,32).

Given this cluster of architectonic similarities, it is not inconceivable that pentic—or pentagrammic—thinking in ancient Chinese natural philosophy and medicine is also historically related to pre-Christian Europe, the Pythagoreans and the pentagram. A cultural syncretism between the Greek culture and those of Central Asia started when Alexander the Great conquered Asia Minor and Central Asia in 334 BC. This cultural exchange gave rise to the Greco-Buddhist art and developed over a period of approximately 800 years in Central Asia between the 4th century BC and the 5th century AD. One might argue that this long period of intellectual exchange could also account for the gradual spread of a pentic star-shaped Mesopotamian or Greek archetype of health and wholeness in Central Asia and subsequently in China.

The adoption and the addition of this pentic archetype/prototype to a pre-existing binary model might also be due to an epistemological need, given that the Yin-Yang topological construct is a simple, hierarchical, tree-like and minimum model that only allows for one parental



**Figure 7.** The pentacle as a ubiquitous symbol of Neo-paganism (33). Image used by permission of the publisher, Llewellyn Worldwide Ltd. [www.llewellyn.com](http://www.llewellyn.com). All rights reserved.

dependency-relationship per variable. It is therefore limited to the conceptualization of simple nonlinear structures and is ideal for binary taxonomies and ontologies (34,35). A non-hierarchical, multiparameter fully-connected semantic network, to the contrary, is an associative and 'rhizomal' model that allows for multiple dependency-relationships per variable, and is better suited to conceptualize dynamic systems where all components are inherently interlinked. In this model, discrete network-states can classify non-linear patterns based on the aggregation of parameter-weights and relationship-strengths alone (36,37). It would be interesting to see whether this epistemological shift from a purely tree-like model to a hybrid one, historically corresponds, or not, to a shift in perspectives from a purely 'ontological' view of disease as an external ancestral/demonological unifactorial phenomenon ('Evil Qi'), to a view that also embraces a 'functional-individualistic' (Unschuld) outlook, and equally perceives disease as a multifactorial loss of an internal elemental/organic harmony (4). If this were the case, such a paradigm drift would certainly require the adoption and the integration of an archetype/prototype of disease that would allow for multiple dependency-relationships per variable, and would also structurally reflect the link between health and wholeness and elemental/organic harmony. The selection of a pentagram would satisfy both requirements.

## Concluding Remarks

This cognitive and epistemological review points to remarkable infrastructural similarities between Chinese Medicine and certain esoteric beliefs of pre-Christian Europe. In both contexts, an associative five-parameter cognitive model paired with occultism, numerology, sacred geometry and magickal thinking underlies the belief system in health and the prevention of disease.

This architectonic similarity is consistent with Paul Unschuld's view that the alleged dichotomy between Western and Chinese notions of disease is completely unfounded.

Nonetheless, Chinese Medicine is widely flourishing in the US and in Europe with the claim of being a unique, independent and comprehensive medical system based on alleged cognitive modalities 'completely foreign to the West' (1,4). In the US alone, approximately 20,000 non-physician practitioners are licensed in over 40 states, and some deliver primary care, with insufficient training in modern health sciences, and with the reliance on ancient metaphysics, anachronous notions of health and disease, and a rudimentary and symptomological nosology (38).

As for the prospect of an epistemological rupture with elementary cognitive models, and a paradigm shift that would lead to a firm biological basis for the testable remedies in such empirical medicines (39,40), one shall recall the words of Thomas Kuhn in *Criticism and the Growth of Knowledge*:

'There are many fields — I shall call them proto-sciences — in which practice does generate testable conclusions but which nevertheless resemble philosophy and the arts rather than the established sciences in their developmental patterns. I think, for example, of fields like chemistry and electricity before the mid-eighteenth century, of the study of heredity and phylogeny before the mid-nineteenth, or of many of the social sciences today. In these fields, too, though they satisfy Sir Karl's demarcation criterion, incessant criticism and continual striving for a fresh start are primary forces, and need to be' (41).

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