

A PHILOSOPHY OF PATTERN:
ZHŪ XĪ (朱熹) AND COMPLEXITY THEORY
COMPLETION OF WISDOM
THROUGH FATHOMING ORGANIC PATTERN
(致知窮理; ZHÌ ZHÌ QIÓNG Lǐ):
Adventures of a Theonaut: Volume 1

by

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ABSTRACT

Ancient Chinese cosmogony is organismic. The basis of the cosmos consists entirely of natural organic patterns, known as *lǐ* (理). These natural organic patterns are found in Confucian text *The Great Learning* (or *Dà xué* 大學). Twelfth century Neo-Confucian Zhū Xī taught a method of study of ancient texts and meditation by which one could become at one with or transparent to natural organic patterns and thereby complete wisdom, beyond knowledge. The method allows dis-covery of natural organic patterns (*lǐ* 理) of the cosmos to be the same as those within oneself. Natural organic patterns of the cosmos are vibration, as evidenced by the use of resonance (*gǎn yīng* 感應) and harmony (*hé* 和). English translations of Chinese have obscured these enfolded meanings.

Modern Western cosmogony as based on Western philosophy and scientific method is reductionist and separates human beings from the cosmos. Through use of modern computers beginning in the 1960s, Western complexity science is able to model ubiquitous, self-organizing natural organic patterns of the cosmos. Western psychology is beginning to recognize the same self-organizing natural organic patterns in evidence in the cosmos are also in evidence within the psyche or self.

This book draws parallels between the fields of Chinese philosophy and complexity science; each field informs the other. This offers a valid and *additive* approach to involvement in a natural organismic cosmogony. The additive approach frees scholars from positivist and reductionist science as the only valid modality through which to study the cosmos. When one engages in concurrent and non-overlapping ways of cognitive and non-cognitive awareness beyond knowledge, in uncovering and inhabiting resonance and harmony with the self-organizing natural vibratory organic patterns of the cosmos, this is described by the ancient Chinese sages as the completion of wisdom.

Acknowledgments

A project of this size, complexity, and focus cannot be completed without the gracious assistance of many people in support of the author. I wish to thank Dr. Yi Wu, for his gentle and consistent offerings of a classical understanding of Chinese philosophy. I thank clinical psychologist Dr. Terry Marks-Tarlow, for her thoughtful and in-depth approach to psychology through the lenses of complexity science, play, and intuition. Last I thank Dr. James Ryan, for his insistence on clarity and unambiguous argument in this book.

I am eternally thankful for the warm support and friendship of medical anthropologist Dr. Margaret Mackenzie, who continues to firmly champion my tentative explorations and maturation into new territories of experience and application of ideas I have wrestled with in this book.

I am deeply appreciative for the friendship and counsel of musicologist, musician, psychologist, and mathematician Dr. Gareth Loy, for the support offered in our mutual conversations and my initial forays into what I had called “people-tuning,” since 2003.

I have come to know how to write in the peculiar scholarly style through effort and guidance from the following editors. To my dear friend, acupuncturist, and technical editor Jodi Weitz, L.Ac., I am thankful for the years of creative talks about writing and on the topics of this book. I thank Jodi Weitz for her penetrating professional management of my *qi* (氣) field through the various stages and stressors of writing this book. Zen practitioner and principal Anna Fitzpatrick Doherty and technical editor Laura Neil, of Together Editing, Inc., have been of

immense assistance in this project, for the numerous personal and group sessions which provided the structural basis from which this book was written. In the initial stages of this project, Katherine H. Lee lent an understanding ear, keen eyes, and definition to the writing experience that had seemed to at first be rather murky and viscous in implementation. She continued to be of significant support through the end of this project. And last but certainly not least, I am thankful for the crisp, thoughtful, and playful Matthew Bronson, who saw my capability for clear scholarly writing a long time before I did. It is Matthew who really held the space for me to come to know myself as a doctoral-level scholar.

I thank Alan Watts, Henry (Sandy) Jacobs, and Mark Watts, for the ideas in the Alan Watts lectures and community radio station KWMR, 90.5 FM in Point Reyes station for the opportunity to broadcast the Alan Watts talks weekly to the West Marin county audience for more than eight and a half years. Without these people, the ideas in this book would not have emerged the way they have.

I thank my son, Henry Cooper Wright, and friends Wendy McLaughlin and Laurie Goren for their patience, understanding, and support through this time of transition in my life.

Dedication

I dedicate this book to philosopher-entertainer Alan W. Watts, and to community radio station KWMR, 90.5 FM, in Point Reyes Station, California. It was through the recorded talks of Alan Watts that I began to have a deep appreciation for Asian philosophy and religion. In 1998, during a break between tuning pianos in Sunnyvale, California I happened to turn on the truck radio and tuned in to community radio station KKUP in nearby Cupertino. While there are numerous radio stations that broadcast a Christian message, I had inadvertently tuned in to this guy who was speaking about Buddhism! At first I didn't get his name but fortunately I was able in another broadcast to learn that it was Alan Watts. I contacted Henry (Sandy) Jacobs, of Inverness, California, who I had learned was the archivist of the Alan Watts talks, and purchased tapes of as many Watts talks as I could afford.

In 2003 I had moved to Bolinas, California, and learned that there was a community radio station for West Marin county in Point Reyes Station that used community volunteers as programmers. I thought I would approach the station to propose a show. I wanted to do an astrology show, but when I approached KWMR program director Lyons Filmer with the proposal, she asked "what do you *really* want (to broadcast)?" Without hesitation I answered "the talks of Alan Watts." I was given the "Spirit and Mind" show, weekly on Tuesday afternoons, between 1 and 2 PM, and began to broadcast the Alan Watts talks in August of 2003.

In 2004, I was offered the opportunity to begin a personal interview show on KWMR, which I called “Attunement: A Guide to Mystical Experience.” The show was to air twice a month on Thursday afternoons at noon. In 2006, CIIS professor Richard Tarnas had come out with a book called *Cosmos and Psyche*. KWMR had received a review copy from the publisher, and as Western astrology has long been a topic of interest to me, I thought I would contact CIIS president Joe Subbiondo for permission to interview not only Richard Tarnas but other notable CIIS faculty such as psychiatrist Stanislav Grof. I came to visit CIIS in the summer of 2006 to interview Tarnas and Grof, and ended up with a doctoral degree in Philosophy and Religion in 2014.

Without Alan Watts and KWMR, these events would not have occurred.

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Chapter 1: Introduction

In this first chapter, I describe my personal connection to the topics of the book. These are my involvement with organic patterns and the parallels I found between organic patterns as described in basic texts of Chinese philosophy and complexity science, and my personal experiences with what I came to call functional transparency with the cosmos. I describe how ubiquitous organic patterns are found both in Chinese philosophy and complexity science, and why this is important. I then describe the three themes of self, parallels, and resonance and harmony, and how they are woven through the six chapters of the book. The chapter concludes with a description and relevance of the hermeneutic method used in the book.

Personal Connection to the Topic

I open this book with three life-changing examples of personal experience of early childhood that eventually brought my focus to the topics of this project. They are exposure to the natural world, exposure to sound, and exposure to alternate paths of religion and spirituality.

Early one summer morning I stepped outside into a bright and vital landscape, when I was five years old, where the forest looked warm and inviting; I had the sense that the woods *loved* me. My father had rented a rural vacation cabin on the shores of the St. Croix River in the small, unincorporated area known as Franconia, on the Minnesota side of the Minnesota–Wisconsin state border. I sensed that this love of and by the woods, would be a life-long love, that would have none of the complexities of the less-than-secure attachment human family

environment in which I was growing up. Archetypally, one could say that I had met the forest Goddess Diana. This was my first exposure to the vital organic¹ patterns of the natural world.

In another pivotal experience of early childhood, I experienced the power of vibration and sound. On a wintry afternoon in early 1954, I was given a balloon at the Shrine Circus. I stood transfixed, holding this balloon, at an entrance to the vast space of the old Minneapolis Auditorium. Circuses in the early 1950s still had live brass bands that played the musical accompaniment for the circus acts. I noticed that the band was on the far side of this vast space, yet their music was causing the balloon to literally vibrate in my hands! I was stunned at the power of sound in that moment—how sound could invisibly fill such a vast space while being able to make the balloon vibrate at such a distance. This was a moment that eventually ushered in my lifetime’s work with a love of sound, resonance, and harmony.

Sundays were a day of exploration when I was growing up. I was raised in the Universalist church, which urged the children in its Sunday School classes to go out into the world and seek philosophies and spiritual paths that fit us as individuals, rather than our trying to fit within some proscribed religious dogma, unless that was what we found was satisfying. In my late teens and early twenties,

¹ The terms “organic” can be used refer to the cosmos as a whole, with inorganic matter in line with organic matter, and “organismic” can refer to human and/or animal consciousness or subjectivity. I use the terms interchangeably, implying a continuum between the living cosmos and individual organisms, suggested by the parallels Chinese philosophy and complexity science.

I became interested in Eastern philosophies, specifically Chinese philosophy, with the *Yi Jīng* (易經) and the *Daò de jīng* (道德經) as the vehicles². This current project is the blossoming of those early seeds. In the following sections, I make arguments for my somatic connection to organismic patterns of the natural world, my love of music that evolved into my professional career as a piano technician, and the development of my interest in Chinese philosophy.

On Connections with Organic Pattern

I have been an enthusiast of the work of philosopher-entertainer Alan Watts since 1968,³ who was in part responsible for establishing the forerunner institution to the California Institute of Integral Studies, the California Institute of Asian Studies. I have broadcast his work on my weekly radio show since 2004,⁴ and have been inspired by him to pursue the topics of Chinese philosophy and complexity science.

One of the main tenets A. Watts (e.g., Watts 2005; 2006, 118) discusses is the idea of the universality of pattern throughout the cosmos. The genesis of this

² Throughout this book, my default position for transliteration of Chinese characters is the pinyin method, but I also use the Wade-Giles method where other scholars have employed it in quotes and book titles. For example, The Book of Changes is: “*Yi Jīng* (易經)” (pinyin) and “*I Ching*” (Wade-Giles). The pinyin will be used first with the Chinese character to follow in parentheses.

³ My first exposure to Alan Watts came through his book, *The Joyous Cosmology* (1962).

⁴ The weekly program is known as *Spirit & Mind* on Community Radio Station KWMR, 90.5 FM in Point Reyes Station, California.

idea begins with the patterns inherent in the *Yì Jīng* (易經), and continues through the work of Zhū Xī, in the Chinese term *lǐ* (理).

Because Watts died in 1972, he was not exposed to the work begun by Lorenz and Mandelbrot on complexity science that was published after Watts's death (e.g., Mandelbrot 1977, 1983; Lorenz 1993). Watts is, however, quite articulate about describing patterns in the natural world in a way that is strikingly similar to what was later written about by complexity scientists (e.g., Bar-Yam 1997, 2-6). I cannot help but think that had Watts lived only a few more years, he would have embraced the tenets of complexity science whole-heartedly, as a Western mathematical and scientific way of approaching the organismic nature of the cosmos (Mote 1971, 19) the earliest Chinese philosophers had been talking about from the beginnings of Chinese philosophy. This is inclusive of the *Classic of Changes* or *Yì Jīng* (易經), and followed through to the work of Zhū Xī and his "School of Principle," *Lǐ Xué* (理學). As a part of the lexicon of the "School of Principle," *Lǐ Xué* (理學), Zhū Xī compiled the "Four Books" *Sì Shū* (四書) from the Confucian classic "Classic of Rites" *Lǐ Jì* (禮記). Civil service examinations were based on knowledge of these Confucian texts and Zhū Xī's commentaries on these texts for some eight hundred years until the final dissolution of the Chinese empire in 1907 CE (Gardner 2007, xxi).⁵

⁵ I explain the "School of Principle" and its longevity in depth in Chapter 2.

I began my study of *Yi Jīng* (易經) as a tool for divination of life experience in 1967, working to build an interpretive reference base of personal experience as related to and described by the texts of various hexagrams and lines, according to given situations across time. It continues to be my experience that the *Yi Jīng* (易經), when asked a well formulated question, continues to be uncannily accurate in describing a life situation. It offers additional viewpoints and contexts by which to integrate and proceed with given situations. When I began working with the *Yi Jīng* (易經), I recall wondering how it was possible that sixty-four⁶ chapters⁷ could possibly encompass what was to me, at age 17, the bewildering and seemingly infinite complexity of human experience.⁸ At age 63, I continue to study and be instructed by the offerings of the *Yi Jīng* (易經) on life experience.

It was very exciting for me to see the Cantor set in the book *Chaos: Making a New Science* (Gleick 1987, 93), as it initially looked like the “bi-grams”⁹ of the *Yi Jīng* (易經). I began to wonder if the *Yi Jīng* (易經) was

⁶ In my studies with Dr. Yi Wu, I have come to understand that an expanded practice is to consider the full 384 four lines that make up the 64 hexagrams.

⁷ I have come also to understand that these 64 chapters are “algorithms” of human experience.

⁸ Forty-five years later, I am pleased to report that my study with the *Yi Jīng* (易經) has continued to fascinate and inspire me, and actually formed the basis for my audacious venture into Chinese philosophy.

⁹ Bi-grams of the *Yi Jīng* (易經) are figures with two lines. See Chapter 6.

fractal,¹⁰ and my suspicions were confirmed by Walter (1996). At the same time I began to wonder, as the *Yi Jīng* (易經) was fractal, if *the situational patterns of life itself were fractal*. I hypothesized that if situational life patterns are fractal, there would be a way to continue to study and understand life itself at greater and greater depths—in an ever expanding context, with complexity science.

In the early 1980s the branches of science in biology, geology, physics, chemistry, and meteorology were beginning to find utility in the ubiquitous patterns of complexity science (Bar-Yam 1997, 1–2)—in the patterns and different modalities for studying structures and patterns in phenomena that had previously been inaccessible to Western science. When I discovered that psychologists had also begun to utilize complexity science to uncover and work with patterns of human behavior and mind (Marks-Tarlow 1999, 2004, 2008a, 2008b; Robertson and Combs 1995; Guastello, Koopmans, and Pincus 2009), I was doubly intrigued.

In my graduate studies, I developed a theory on the mechanism of the *Yi Jīng* (易經; see Wright 2007, “Fractal Calculator of Chaos”). Confucius’s contribution and commentary to the *Yi Jīng* (易經) states how the *Yi Jīng* (易經) works, in the section of the text called the “Ten Wings.”

¹⁰ By *fractal*, I mean “of fractional dimensionality” (see complexity science terms glossary).

Chapter 4, Verse 4: In (*Yi Jīng* 易經, The Book of Changes) are included the transformation of¹¹ and the scope of everything in the heavens and on earth, so that it doesn't go too far. Indirectly bent toward earth, trees, and grasses—so nothing can be abandoned or nothing is missed. Therefore by means of it we can penetrate the Tao of day and night, and so understand it. Therefore the spirit is bound to no one place, or the Book of Changes to any one form. (Wilhelm and Baynes 1967, 296)

Chapter 4, Verse 1: The Book of Changes is vast and great. When one speaks of what is far, it has no limit. When one speaks of what is near, it is still and right. When one speaks of the space between heaven and earth, it embraces everything. (Wilhelm and Baynes 1967, 301)

Confucius states here that the *Yi Jīng* (易經) has the capability to assess the organismic patterns of the cosmos, and I hypothesize that the *Yi Jīng* (易經) does this by reflecting and resonating¹² the self-similar organic patterns of the cosmos to the student through its lines and algorithms (Walter 1995, 1996; Wu, conversation with author, July 6, 2013, San Bruno, CA).

My mentor, Dr. Yi Wu has said that “though we cannot *know* the *daò* (道), we can know the *function* of the *daò* (道). The function of the *daò* (道) is to make space for things [to iterate]” (“Ten Wings” lecture, Fall 2009b, San Francisco, CA). Since behaviors of complex systems could be embraced by fractal geometry, I hypothesized that the *Yi Jīng* (易經) could, as a human/cosmos fractal interface, also penetrate or indicate the local fractal iteration of the complexity of the non-

¹¹ Underlined passages are corrected versions of the Wilhelm/Baynes translation of the *Yi Jīng* (易經), according to understandings provided by Dr. Yi Wu (2008, 2009b) in his courses on the *Yi Jīng* (易經).

¹² See Chapter 7 on the term “resonance,” or *gǎn yìng* (感應). Dr. Yi Wu has confirmed this hypothesis when he said, “[Without] *gǎn yìng* (感應) [resonance], [there can be] no *Yi Jīng* (易經)” (Wu, Divination/Wisdom, Fall semester, 2013).

local cosmos by what is known as the collapse of the quantum wave function (Ψ ; see Bohm 1992, 128–29; Wolf 1981, 1984).^{13,14} This occurs in the moment the oracle is consulted¹⁵ by a person. The *Yì Jīng* (易經) would then indicate, by one of its 64 algorithms or hexagrams (figures made of six lines) and 384 lines, the example of organic pattern of what the cosmos was doing at the focal point of consciousness, of the person that cast the hexagram in that moment. The *Yì Jīng* (易經) thus fulfills its teaching function, in training the person who uses it to become aware, by a *shift in personal metaphysics*, of the self-similar patterns of fractal iteration of the cosmos in the present moment, through personal observation through casting a hexagram.

Alan Watts (Jacobs 1973) has called the *Yì Jīng* (易經) a sort of “Rorschach test”¹⁶ in its divinatory capacity, yet I have come to the conclusion

¹³ In the Copenhagen interpretation of quantum mechanics, the quantum wave function is addressed by Schrödinger’s wave equation. This interpretation suggests that, prior to measurement, subatomic particles exist in a state of “super-position,” prior to observation. That is, that the subatomic particles exist in a nonlocal “cloud” of probabilities and possibilities as to location and velocity, only one of which value is “collapsed,” by the activity of observation and measurement (theoretical physicist J. Halliwell, personal conversation with author, September 10 and 14, 2013).

¹⁴ Ψ : Also known popularly known through physicist Fred Alan Wolf as “popping a quiff” (Wolf 1981, 169-75; 1984, 178, 180, 182-83, 240).

¹⁵ Through coins, yarrow stalks, or colored tokens.

¹⁶ The Rorschach test was developed as a projective psychological test in 1921 by Hermann Rorschach. The Rorschach test invites participants to find meaningful patterns in the structures of random inkblots. These meaningful patterns projected onto “neutral” (and *fractal!*) inkblots by participants are then interpreted by psychologists as a way to come to understand latent configurations of meaning in the unconscious mind (e.g., Carson and Butcher 1992; 585, 594)

that the *Classic of Changes* is more than a receiver of human projections, having survived through five thousand years of civilization.

Dr. Yi Wu (2009b, 2009c) suggests that it was Confucius that developed the *Classic of Changes* into the basis of Chinese philosophy by the addition of the Confucian appendices known as the “Ten Wings,” (e.g., Wilhelm and Baynes 1967). Confucius’s contribution to the *Yi Jīng* (易經) opens a way to understand the profound influence the *Yi Jīng* (易經) has had as a basis for Chinese philosophy.¹⁷

The idea of iteration of fractal pattern was a key inspiration to my bringing the topics of complexity science and Chinese philosophy together, as well as how the algorithms of the *Yi Jīng* (易經) could so succinctly offer a meta-perspective on life situations. This understanding of the *Yi Jīng* (易經), along with the lectures of Alan Watts on Asian philosophy (particularly with his references to the character *lǐ* 理 and organic pattern; A. Watts 2006, 118), led me to grasp the importance of the parallels between complexity science and fractal geometry on the one hand, and Chinese philosophy on the other. In particular, I became interested in how each could serve to illuminate previously difficult to understand ideas of the other.

¹⁷ When I initially considered a doctoral degree in Chinese philosophy, I was daunted by the thought of study of such a complex topic. Dr. Yi Wu said that the *Yi Jīng* (易經) was about 40% of the basis of all Chinese philosophy (Wu, 2007a, 2007b, 2008b, 2009a). Being that I had studied the *Yi Jīng* (易經) from 1967, hearing this from Dr. Yi Wu was heartening in that I had not realized how much of Chinese philosophy I had already become familiar with.

In one of the Alan Watts' taped lectures from the late 1960s, in his book *Eastern Wisdom, Modern Life: Collected Talks, 1960–1969*, Watts speaks about the word *lǐ* (理) as meaning “the markings in jade, the grain in wood, or the fiber in muscle” (A. Watts 2006, 118), that was a next clue for me in the parallels between Chinese philosophy and complexity science. Watts suggested that one would find this translation of *lǐ* (理) in the work of Sinologist Joseph Needham.

I made a connection with patterns in jade as “frozen turbulence,” and thence I was drawn to complexity science and the studies of Lorenz (1963), who was studying the mathematics of turbulence. This led to the finding of parallels between complexity science and Chinese philosophy. The *Yi Jīng* (易經) has also been found to be fractal, one of the ways of looking at organic patterns in the natural world (Walter 1996).

In the scholarly work of Joseph Needham and his book *Science and Civilisation in China, Volume 2: History of Scientific Thought*, Needham defines *lǐ* (理) as Watts does above:

The word *Lǐ* (K978)(理), in its most ancient meaning, signified the pattern in things, the markings in jade or fibres in muscle; as a verb it meant to cut things according to their natural grain or divisions. Thence it acquired the common dictionary meaning “principle.” *It undoubtedly always conserved the undertone of “pattern,”* and Zhū Xī himself confirms this. (Italics mine; Needham 1956, 558)

Needham's work provides a scholarly basis for this project, and confirms the alternate translation¹⁸ of the term *lǐ* (理) as “organic pattern” as well as the more

¹⁸ See the introduction of Chapter 6 for my comments and position on translation theory.

conventional¹⁹ Western, left-hemisphere²⁰ oriented translation of *lǐ* (理) as “principle.”

On Functional Transparency: Forgetting the Self

I have been a piano technician for forty-three years as of July 2013, and among other roles have worked for the Steinway Concert-Artist program. Pianos in a concert-artist program are groomed for a number of hours per week²¹ to keep them in peak condition for visiting concert artists to select for performance in large cities around the world. When performing a tuning on a concert-artist piano, several hours before a performance, one takes extra time to stabilize the piano so that the instrument is working at its best for the upcoming concert.

On May 18, 1993, at 3:30 p.m., I finished tuning a Steinway Model L grand piano²² after ninety minutes of work, and upon testing the tuning, discovered the piano had disappeared! What I mean is that the piano had become *functionally transparent*; that is, the piano was at such a peak of adjustment that

¹⁹ I have come to understand the word “conventional,” as how a group will “convene” or come together to agree (tacitly or otherwise) upon a particular way of understanding meaning. To state that Needham’s and my translations are “unconventional” is to say that my translations are suggesting access to layers of meaning not available in the conventional English translations. I am less interested in “precision” than I am in inviting the reader to discover embedded meanings outside the conventional. I feel that this nonconventional approach strengthens rather than weakens the reader’s understanding, in that such nonconventionality is flexible and pliable, rather than precise and rigid.

²⁰ See Appendix A on brain-hemisphericity.

²¹ In contrast, pianos in normal home use may get an hour of maintenance on a yearly basis.

²² The Steinway Model L grand piano measures 5 feet, 10 inches in length, and is considered a smaller concert instrument for intimate performance halls.

there was virtually no impediment for the performer and the production of music on the instrument. I could simply feel an emotion and hear it expressed as music, and not notice the piano²³ at all. Later that afternoon I went to a friend's coffee shop and thought to myself, if a piano can be attuned in such a way, to a peak capability, perhaps a human being could also become functionally transparent through personal attunement. That is, that a human being could function in the world without the person's thinking or ego getting in the way.

At that same time I had been a visitor at the Minnesota Zen Center, in Minneapolis, and would go to sit *zazen*²⁴ with the Abbot, Dainin Katagiri Roshi, prior to his lectures on Wednesday nights. One Wednesday night I was in the group sitting *zazen* with Katagiri Roshi, and noticed his contemplative, calm affect during the meditation period. The meditation period ended, and he began his lecture. I was intrigued to notice that his affect had not changed. Then the lecture ended, and he began to greet the people in attendance to the lecture—again, even though his physical activity was different, I noticed his affect hadn't changed! It was then I realized that he was still in a meditative state, and that this state carried through his various activities. I got a sense that this was the functional transparency I had been seeking.

Only upon study of the work of Zhuangzi with Dr. Yi Wu at the California Institute for Integral Studies (Wu, 2008a), did I come to know the actual lineage

²³ Nor did I notice myself, seated at the piano, playing it.

²⁴ *Zazen* is the term for Zen Buddhist-style sitting meditation.

for what Katagiri Roshi was doing. In Watson's (1968, 57–58) translation of *The Complete Works of Chuang Tzu*, Zhuangzi speaks of “fasting the mind.”²⁵ The “fasting of the mind” is the source of what both the founder of Ch’an Buddhism, Hui Neng, and later the patriarch Dōgen Zenji,²⁶ who brought Ch’an from China to Japan (where it is known as Zen), called “forgetting the self” (Tanahashi 1985, 70).²⁷ This state of non-being is functional transparency, a “forgetting of the self,” that Zhū Xī talks about in his way (slightly earlier than Dōgen) when quoting his teacher Chéng Yí (de Bary 1985, 338); discussed in Chapter 6).

The reason for this book

This book investigates the potential of parallels among certain ideas in Chinese philosophy (e.g., Chan 1973, 1986; Chu 1990; de Bary 1985, 1991; Gardner 2007; Jones 2008; Legge 1893; Needham 1956; Wilhelm and Baynes 1967) on the one hand and selected concepts from complexity science and the subfield of fractal geometry on the other (e.g., Mandelbrot 1963, 1982; Cantor 1883; Julia 1918; Lorenz 1963; Gleick 1987; Marks-Tarlow 2008b, 2012). As I argue, both fields support the development of human self-understanding and understanding of aspects of the natural world, specifically through perceiving and interacting with patterns and principles of the natural world. Because of these

²⁵ See Chapter 7, “Cultivating Personal Resonance,” for the specific Zhuangzi quote regarding “fasting the mind” (Watson 1968, 57–58).

²⁶ See Chapter 7, “Cultivating Personal Resonance,” for Dōgen’s 1233 CE treatise, *Actualizing the Fundamental Point* (also known as the *Genjō Kōan*; Tanahashi 1999, 70).

²⁷ It was particularly striking to me that Dr. Yi Wu (2008a) was able to show a direct lineage from Zhuangzi to Dōgen Zenji.

parallels, each field can potentially inform the other, which suggests there may be an opportunity to cultivate deeper human understanding of the natural world and ourselves by integrating tenets from these different ways of knowing.

In this part of the introduction, I first briefly define the particular elements and aspects of Chinese philosophy, complexity science, and fractal geometry used in this study (each is, of course, discussed in much greater detail in the chapters to follow). With that understanding established, I close with a discussion of the need for the book.

Elements of Chinese Philosophy Utilized in This Book

This book focuses on the work of Neo-Confucian scholar and philosophical synthesist Zhū Xī (朱熹), which offers one example of the metaphoric ways of perceiving and interacting with the natural world found in Chinese philosophy. In the Song Dynasty (Sòng Cháo, 宋朝) of twelfth-century China, Zhū Xī developed what is conventionally translated as the “School of Principle” or *Lǐ Xué* (理學; Bruce 1922, xv, 16; Chan 1967, xvii; Gardner 1990, xii n. 2, 5; Wittenborn 1991, 9; Cua 2003, 944), which brought focus to specific Confucian texts known as the “Four Books” (e.g., de Bary and Bloom 1999, 1:668, 721; Hon 2003, 135; Gardner 1986, 3–4, 13, 15; Gardner 2003, 49, 153; Gardner 2007). The first of these “books,” the *Great Learning* or *Dà Xué* (大學; Gardner 2007, xxv), held a pivotal position in the lexicon of Neo-Confucianism, and all four of the books were key reference texts for the governing of China for nearly 800 years (e.g., Gardner 2003, 2007); therefore, it is not surprising that a long-standing controversy among scholars concerns what Confucius actually

meant by the directives in the *Great Learning*. In particular, these controversies focus on the ontological and epistemological implications of Confucius's directive to “extend knowledge and investigate things” (Gardner 2007, 5; also see de Bary and Bloom 1999, 880–84 for further discussion of these directives and their translations into English).

In the *Great Learning* are instructions on how to “make the world Peaceful” (Gardner 2007, 5), which Chéng Yí and Zhū Xī suggested might partially be addressed through Neo-Confucian meditative practice. One example of this practice is known as *jìng zuò* (靜坐) or “quiet-sitting” (de Bary 1985, 338–39; de Bary 1975, 15, 17–18, 19, 23–28; de Bary and Bloom, 1979, 22, 26–27; Gardner 1990, 177; R. Taylor 1988). This Neo-Confucian meditation practice focuses not only on one's interior state, but also on the cosmos at large, where after some effort, an integrated awareness of the unity of self and cosmos may be realized. Through quiet-sitting or *jìng zuò* (靜坐), the self and the cosmos can more easily be seen to be part of the same infinite organic pattern (de Bary 1985, 338–39; R. Taylor 1988)—in Chinese philosophy, this meditative practice is called, in conventional English translation, “the completion of knowledge through plumbing pattern [*zhì zhī qióng lǐ*, 知至窮理]” (de Bary and Bloom 1979, 12).

In the present book I bring forward alternate interpretations of several terms specific to Confucius's directive in the *Great Learning*. Based on the alternate meanings proposed for those terms, I further explore practices of Neo-Confucian meditation (inclusive of quiet-sitting or *jìng zuò* 靜坐) through the parallels offered by complexity science and its subfield fractal geometry, which

also support the realization of the unity of self and cosmos (Marks-Tarlow 1999, 341; 2004, 61; 2008b, 294–95; 2010, 53–56; 2011, 125). The next section describes the specific elements of those fields relevant to this discussion.

Aspects of Complexity Science and Fractal Geometry Utilized in This Book

Western mathematicians have long sought to understand and metaphorically model the natural world using numbers (e.g., Lakoff and Nùñez 2000; Loy 2006, 2007). In Western mathematics, the discovery and development of complexity theory and the subfield of fractal geometry offer striking new possibilities for humans to understand both the natural world and ourselves.

Complexity science describes how increasingly complex systems²⁸ self-organize in nature, out of simple elements in far-from-equilibrium conditions (sometimes called non-equilibrium conditions) (e.g., Nicolis and Prigogine 1977, Prigogine 1971, 1977; Prigogine and Stengers 1984) A simple example of a complex self-organizing system in far-from-equilibrium conditions is the downhill flow of water in a river that self-organizes in turbulence and eddies as it flows.

In the context of this book, the term *fractal geometry* is used to define a subfield of complexity science. Fractal geometry often represents the *end patterns of complex systems*; in addition, the term describes multidimensional objects that show self-similar details on multiple scales, where the pattern of the whole is

²⁸ A *complex system* is differentiated from a simple system by the amount of information needed to describe the system; see Chapter 4 for an in-depth, comprehensive definition and discussion of complex systems.

reflected in the pattern of the parts, whether in space or time (e.g., Briggs and Peat 1989, 14, 1999, 23–30; Mandelbrot 1983, 5; Schroeder 1990, 218; Vrobel, Rössler, and Marks-Tarlow 2008b, 21, 23, 27). *Fractal geometry* refers to a term first coined by mathematician Benoît Mandelbrot (1977, 5) as a shortening of the term *fractional geometry*, which involves fractions of dimensions between the Euclidian dimensions represented by integers. If a straight line has one dimension (length) and a plane has two dimensions (length and width), as an example, a personal signature written on a piece of paper has a dimension somewhere between one and two dimensions, as it is more than a straight line and less than the plane (piece of paper) on which it is written. A simple example of self-similar details where the pattern of the whole is reflected in its parts in biology is the leaf of a fern. The basic shape of the fern is an isosceles triangle. The leaf of a fern is what is called a compound leaf, meaning that the leaf grows with many parts. If one looks at these smaller parts, the leaflets of the large leaf are also shaped as isosceles triangles. And these leaflets themselves have leaflets, which are also shaped as isosceles triangles.

Using fractal geometry, one can focus on a part of the larger pattern of one of the examples above, and find smaller patterns similar to the large pattern within the larger pattern. Of fractal patterns that are the end patterns of complex systems of meteorology, geology, and botany, mathematician Benoît Mandelbrot (1983, 1) says “Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightening travel in a straight line.” Each pattern has detail at all scales, and each scale reflects the same fractal dimension. For

example, in meteorology one can focus on the pattern of a lightning bolt, and then on the successively and similar smaller branchings of that lightning bolt, that have themselves similar smaller branchings. In geology one can focus on the features of a mountain and pattern of a river basin and see those features reflected at smaller scales. In botany one can see the trunk of a tree and its roots and branches, all having similar patterns within the larger pattern. For a more humorous example, in entomology:

“So, naturalists observe, a flea
Has smaller fleas that on him prey;
And these have smaller still to bite ’em;
And so proceed *ad infinitum*.” (Swift 1733, 20)

Of particular interest to this book, complexity theory and fractal geometry allow an almost infinite degree of modeling the self²⁹ (e.g., Bütz 1992; Cabral 1997; Delignières, Fortes, and Ninot 2004; Finke and Bettle 1996; Guastello, Koopmans, and Pincus 2009; Hogan and Thomas 2001; Marks-Tarlow 1999, 2004, 2008a, 2008b, 2010, 2011, 2012; Pincus 2001; Robertson and Combs 1995; Senior 1987; Sulis and Combs 1996; see Chapter 6 for detailed discussion), as well as modeling the natural world (e.g., Barnsley 1988; Bak 1996; Lewin 1992; Lorenz 1993; Mandelbrot 1977; Schroeder 1990).

Expanded capabilities for mathematical modeling have only become possible since the development of the enhanced computational power of electronic computers in the modern digital age, and have been well documented (e.g., Barnesley 1988; Mandelbrot 1977; Schroeder 1990). This enhanced

²⁹ See the theme of the “self” in Chapter 4.

computational power of computers offers new capabilities for mathematical modeling, far beyond the more familiar, reductionist models of Western science (e.g., Bak 1996, 60; Kauffman 2008). Perhaps the most striking of the displays of mathematical models offered by complexity science and fractal geometry are the visual patterns produced on digital computers, allowing non-mathematicians ways of seeing and understanding organic patterns in the natural world that were previously unavailable (e.g., Stewart, Clarke, and Lesoir-Gordon, 2004). The primary mathematical model is what has come to be known as the “Mandelbrot Set,” which as been said to be “the most complex mathematical object known to humankind” (Marks-Tarlow 2002, “Fractal Dimensionality,” para. 1). When “zooming in” on the features at the edges of the Mandelbrot set, an infinity of remarkable, self-similar patterns may be seen.

Need for the Book

Numerous writers have shown that the basic tenets of complexity science (to include a subset of complexity science, fractal geometry), are readily accessible for those who are non-mathematicians (e.g., R. Abraham and Shaw 1982; F. Abraham, Abraham, and Shaw 1990; Bak 1996; Briggs and Peat 1989, 1999; Stewart, Clarke, and Lesoir-Gordon 2004; Gleik 1987). In this book, basic tenets of complexity science and fractal geometry are compared in parallel with particular aspects or tenets of Chinese philosophy, with more depth and detailed attention paid to specific, relevant, original Chinese texts and unconventional yet valid translations of those texts. David Jones (2008, 21–24; Jones and Culliney 1998, 1999) is one of the first to draw parallels between tenets of Chinese

(specifically Confucian) philosophy and chaos theory (which evolved alongside complexity theory and fractal geometry). The present book builds upon Jones and Culliney's (1998, 1999) work and the work of Senior (1987), Condé (2001), and Marks-Tarlow (1999, 2004, 2008a, 2008b, 2010, 2011, 2012). As humans find the same contours of organic patterns of the cosmos to be operational within human-kind, people can also come to know themselves as being at one with the cosmos (Kauffman 2008, 287).

Complexity science and a subfield, fractal geometry on the one hand and Confucian and Neo-Confucian views on the other, when examined closely support each other in mapping organic patterns of psychological and cosmic (natural) phenomena, as shown by the work of Jones and Culliney (1998, 1999) and Jones (2008). The present book deepens this paralleling of views, potentially offering an expansion of understanding in both areas.

Important in this investigation are the alternate, unconventional, yet valid translations of some key Chinese terms and texts.³⁰ The reason alternate and unconventional translations are important is that when the alternate and unconventional translations are used, the parallels between complexity science and Chinese philosophy are more easily seen.

As examples of translations that show these parallels, I begin with two Chinese terms: *lǐ* (理) and *gè* (格). When restricted to [Western, logical] definitions of *lǐ* (理) as “principle,” and *gè* (格) as “investigate,” parallels of

³⁰ Please see the introduction to Chapter 6 for my thoughts on translation theory and brain hemisphericity.

Chinese philosophy with organic patterns of complexity science and the subfield fractal geometry are more difficult to see. The term *lǐ* (理) has been conventionally translated into English as “principle,” and is used in English translations as the name of Zhū Xī’s school of thought, known as *Lǐ Xué* (理學): the “School of Principle” (e.g., Chan 1973, 573; Fung 1973, 500). The term *gè* (格) is conventionally translated as “investigate,” and is used in a key phrase at the center of Confucius’s *Great Learning*: “extension of knowledge lay in the investigation of things” (*Zhì zhī zài gè wù*, 致知在格物: e.g., Gardner 2007, 7; Legge 1893, 358).

When *lǐ* (理) and *gè* (格) are both alternately translated as “organic pattern” (e.g., Needham 1956, 558; Senior 1987, 32; A. Watts 2006, 118) the parallels between complexity science and Chinese philosophy are more easily seen. Zhū Xī’s *Lǐ Xue* (理學) is translated as the “School of Organic Pattern.” The sentence in the *Great Learning*, (*Zhì zhī zài gè wù*, 致知在格物), becomes “[completion of wisdom] lay in the patterning of things.” Detailed arguments regarding these alternate translations are provided in Chapters 2, 3, 6, and 7.

A small number of studies (Senior 1987; Jones 2008; Jones and Culliney 1998, 1999) have touched on the parallels between complexity theory and the subfield fractal geometry on the one hand, and Neo-Confucian or Chinese philosophical notions on the other—but there has been no in-depth attempt to trace the parallels between Chinese philosophy and complexity science by examining several crucial Confucian terms, such as *lǐ* (理) and *gè* (格), with a

view to a more in-depth use in translation to illuminate potential parallels. This investigation may therefore help to advance understanding along the scientific, psychological, and philosophical axes.

Thesis Statement, Basic Chinese Terminology, and Structure

In this part of the introduction, I present the thesis statement, provide an introduction to the use of Chinese terminology, and describe the structure of the book. These statements clarify the focus of the book.

Thesis Statement

In this book, I argue that a change in the conventional translation and use of the term *lǐ* (理), from “principle” to “pattern,” serves to illuminate Confucius’s, Chéng Yí’s, and Zhū Xī’s multiply implied meanings of the words *gè wú* (格物) and *lǐ* (理). This alternate translation provides a foundation for a dialogue between the teachings of these Chinese philosophers on the one hand, and complexity theory and fractal geometry on the other. Based on the additional understanding of Zhū Xī’s *Sentences and Phrases of the Great Learning* or *Dà-Xué Zhāng-Jù* (大學章句), and *Questions and Answers Concerning the Great Learning* or *Dà-Xué Huò-Wèn* (大學或問; Munro 1985, 338–39) reached from this alternate translation, complexity theory, fractal geometry, and Neo-Confucian meditation (of which *Jìng Zuò*, 靜坐, or “quiet-sitting” is an example) all serve to offer insights through the fathoming of patterns (*qióng lǐ*, 窮理) of the cosmos, the psyche, and the self, for the completion of wisdom (*zhì zhī*, 知至).

Fundamental to this thesis is the concept of *natural organic pattern*: “All of nature is made up of self-organizing vibratory pattern,” to quote Rupert Sheldrake (conversation with author, September 2, 2012). Patterns of one kind or another seem to be ubiquitous in the cosmos (e.g., Bak 1996; Barnsley 1988; Bar-Yam 1997; Needham 1956; Jacobs 1973). Human beings have been engaged with attending to patterns for a very long time. We look at patterns of the stars, the natural world, of life experience, and of social and internal experience. Biological predisposition plus cultural background frames how human beings initially attend to these patterns (e.g., Tu and Tucker 2003, 39–55). In the West, in one way or another, humans have tried to understand patterns by separating the one who studies from that which was studied, as a more or less reductionistic method. In Chinese philosophy, farmers, scholars, and sages were attending to how human beings are an integral and essential part of the holistic organic patterning that is the cosmos (e.g., Mote 1971, 17–19; Needham 1956; Tu and Tucker 2003, 4; Tu 1985, 35).

The genuine Chinese cosmogony is that of organismic process, meaning that all of the parts of the entire cosmos belong to one organic whole and that they all interact as participants in one spontaneously self-generating life process. (Mote 1971, 19)

Here Princeton Sinologist and Fullbright Scholar (Stevens 2005) Frederick W. Mote succinctly captures the participatory and organismic basis of Chinese philosophy.

Pythagoras was one of the first in the West to begin to develop the idea that the patterns of the cosmos could be understood as number, through the science of mathematics. (e.g., Burkert 1972). In Chinese philosophy, one of the

oldest texts that begins to work with the patterns of life experience is the *Yi Jīng* (易經) or *Classic of Changes* (e.g., Blofeld 1965; Jou 1984; Karcher 1995; Legge 1899, 1963; Sung 1935; Wilhelm and Baynes 1967; Wing 1979; J.-N.Wu 1991; Y. Wu 1998, 2012). The binary mathematics that Western philosopher Leibniz developed were the necessary precursor of the development of modern computers. There are alternative theories about the basis for Leibniz’s development of binary mathematics. In one theory, Mungello (1977) and Cook and Rosemont (1994) posit that Leibniz developed binary mathematics from his study of the *Yi Jīng* (易經); Mungello 1977, 15, 36, 43, 44, 51, 60, 67–68, 70, 116, 140, 148, 159, 163; Cook and Rosemont 1994, 6, 8–9, 16–17, 22, 73–74, 132–38). In another theory Eglash (1999, 95, 98, 100–1) suggests that Leibniz developed binary mathematics from African tribal sources. “While there were many other influences in the [life] of...Leibniz, it is not far-fetched to see a historical path for base-2 calculation that begins with African divination” (101). In *both* of these theories, Leibniz developed binary mathematics from the inherent *natural organic patterns* referenced by either and perhaps both Chinese and African cultures.

Though there were predecessors in the study of complexity science, whose work I detail in Chapter 6 (e.g., Cantor 1883; von Koch 2004; Julia 1918; Poincaré 1890; Sierpiński and Krieger 1934), through the aid of modern computers, Lorenz (1963) and Mandelbrot (1963) began to unfold the work of their predecessors in ways that mathematically illustrate, in great detail, the organic natural patterns discussed in the earliest written texts of Chinese philosophy. Most notably these were the *Yi Jīng* (易經) or *Classic of Changes*,

and the *Dà Xué* (大學) or *Great Learning*, which were both of the so-called “organic model” of philosophy.

In this book, I explore parallels between Chinese philosophy and complexity science, with two main intentions.³¹ First, I investigate how the insights and understandings available from Chinese philosophy can begin to illuminate the enigmas of complexity science (for the non-mathematician, at least). Second, I consider how ideas and structures of complexity science that are well within the grasp of the non-mathematician can illuminate the enigmas of certain aspects of Chinese philosophy,³² to the benefit of both fields.

Translation and Use of Chinese Terms

When discussing, using, and translating Chinese terms,³³ I consistently provide the pinyin romanization of the character with appropriate tonal markings, and then the traditional form of the character. I prefer the traditional character versus the “simplified” version of Chinese characters for several reasons. The texts and characters under consideration in this book were primarily written in the traditional form. A secondary and less important consideration is that even though the time taken to write simplified Chinese characters is shorter than traditional characters (for the reduction in the numbers of strokes), the traditional form of

³¹ The term *complexity science* is inclusive of the terms *chaos theory* and *fractional dimensionality*, as explained in depth in Chapter 6.

³² I refer to elements that can be enigmas even for native Chinese speakers (see Chapter 2).

³³ See introduction of Chapter 6 for my thoughts on translation theory and brain hemisphericity.

character has a kind of resonance to it that is less present in the simplified form. The traditional form of Chinese character also requires a more meditative state to write consistently.

My translation of Chinese terms in this book is legitimate, though somewhat unconventional in the usual Western sense. In my opinion, many Chinese terms are translated into English with Western philosophical presuppositional biases regarding the separation of human beings from the rest of the cosmos, versus the organic model of Chinese philosophy, an argument which I discuss in depth in Chapter 6.

Because of the differences of English/Western grammatical conventions and Chinese grammar, my translations of Chinese will not adhere to standard English grammatical translations. In addition, Chinese language has within it an ambiguity which implies a potentiality of multiple and enfolded meanings, which I wish to illuminate in this book. I ask my Western readers for patience in reading translations that seem grammatically “out of whack,” so they may find the enfolded meanings that are latent within translation that does not follow conventions of English grammar.

Even in Chinese philosophy, words take on a bias of meaning depending on which philosophical school a scholar is affiliated with. I suggest several examples here, though it is not my intention to venture into an exhaustive examination of the biases of linguistic meanings. As an example, in the Chinese philosophical school of Legalism (which was the basis for Chinese law), the basis of human action is considered to arise from selfish and negative motives. Humans

thus need legal governance from an external social governing body—from this perspective, the character *lǐ* (理), has the meaning of “principle, or law” (Bruce 1922, 3). On the other hand, Mencius, (who was a follower of Confucius, and whose writings consist one of the “Four Books” of Zhū Xī), considers the basis of human action to arise from positive motives, internally generated from an inherent sense of morality. Human beings who are self-governing through internal morality need no external governance. This approach comes from a view of the organismic model of Chinese philosophy, and the character *lǐ* (理) in this context has the meaning of “organic pattern” (see Chapter 3).

Relevant to these translation examples (and of particular importance to this book) is the idea of multiple layers of meaning enfolded in Chinese characters, called “paranomasia” by Roger Ames (2008, 37–48). Ames argues that as a reader gains greater understanding of a text, the initial *surface* meanings of characters *deepen*, yielding these enfolded meanings through repeated exposure to context, and perhaps discussion with others. As discussed in this chapter in the methods section, this idea is the very essence of the hermeneutic method.

One pivotal sentence from Confucius’s text, the *Great Learning* or *Dà Xué* (大學) serves as an additional example used throughout the book. From verse 2, the sentence reads: *Zhì zhī zài gé wù* (致知在格物). This sentence was first translated into English by James Legge (1893, 358) as, “Such extension of knowledge lay in the investigation of things.” My own experimental yet legitimate translation is perhaps more consonant with the integrative, organismic, interpretive model of Chinese philosophy suggested above by Needham (1956),

Tucker (Tu and Tucker 2003, 4), Tu Wei-Ming (1985, 35), and F. W. Mote (1971, 17–19). I render this same sentence as, “The completion of wisdom [is vitalized through] the patterning of being” (see Chapters 3 and 6 for detailed discussion and Appendix B for alternate translations of these characters). I base this re-translation on the extended contextualization offered by complexity science.

Where appropriate (particularly in Chapter 6), I provide contrasting translations of the same passage, first the conventional English translation and then my own re-translation, to help readers further gather the sense that I wish to bring to these translations. Appendix B also provides a Chinese glossary.

Focal Passage: Zhū Xī Quote

The quote by Zhū Xī as explored in Chapter 6 is a focus of this book and directly informs the title. In a way, it epitomizes the focus of Neo-Confucianism and Zhū Xī’s “School of Organic Pattern,” *Lǐ Xué* (理學), also known in conventional translation as the “School of Principle.” I make specific changes in Dr. de Bary’s translation, which, in my opinion, allow the content to be more accessible. I invite the reader to keep in mind that the meaning of the quote is hopefully transformed by the content of the book.

Terms in the Title of the Book

The title of this book, *The Completion of Wisdom through Probing/Fathoming Pattern* (*Zhì zhī qióng lǐ* 知致窮理) comes from this focal quote from Zhū Xī as explored in Chapter 6. In this section of the introduction, I briefly unpack each of the terms in this title; each translation is discussed in detail later in the book.

Wisdom (zhī 知).

As a window into the Western perspective on wisdom, the *Oxford English Dictionary* (OED; see *Oxford English Dictionary* [OED] Online 2013i, def. 1a, 1c, 2a, 4) defines *wisdom* as a “capacity to judge rightly...one of the manifestations of divine nature...knowledge...sanity (or) reason” (for discussion of the difference between wisdom and knowledge, see Chapter 4).

In a Confucian context, some say wisdom is based on knowledge (Yao 2006, 56, 87), while others say wisdom is a “way of life” (Yao 2006, 56–58). Yao (2006, 87, 173) states,

in the communal respect, wisdom becomes a particular way of life through dealing with a variety of interpersonal relationships...a way of dynamic living...to run a successful course of personal life.

The ultimate development of wisdom in a Confucian context is to become a “sage.” According to Gardner’s (1990) translation of Zhū Xī, because everyone is born with the same lǐ (理, pattern/principle), everyone has the capability to become a sage. This wisdom is considered *a priori*, that is, already existent (Yao 2006).

In this book, I argue that through wisdom,³⁴ human beings open to perceiving, understanding, and embodying the patterns of the cosmos. This approach considers wisdom as something other than thought, and rather as a participation and an experience in the world of which humans are an integral part.

³⁴ It’s important to be aware that *wisdom* is an anthropomorphic term, the actual experience of which is beyond the sharp focus of left hemisphere attention. This is discussed further in Chapters 4 and 6, and in Appendix A on brain hemisphericity.

To complete wisdom is to inhabit this state fully and spontaneously—to become attuned in resonance and harmony with all that is (see Chapters 2, 3, 6 and 7 for a detailed discussion).

Completion (zhì 致).

As discussed in Chapter 6, I argue that when fully uncovered, *completion* is the process of fully inhabiting (Welwood 2008a, 2008b, 2008c)³⁵ the resonant organic patterns, spontaneously, in the moment (de Bary and Bloom 1979, 12; de Bary in Munro 1985, 338–39).³⁶ Zhuangzi (Dōgen Zenji) talked about this process as “forgetting the self” (Tanahashi 1985, 70; Watson 1968, 57–58, 370; see Chapter 7: Resonance) while Csikszentmihalyi (1990, 3) describes the process as “optimal experience.” Quiet-sitting (jìng zuò 靜坐), which is a style of meditation³⁷ in Neo-Confucianism, is a method for completing the connection with imperturbable tranquility, from which complementarity and pattern can be engaged (R. Taylor 1988).

Two quotes from Zhū Xī relate to this understanding of completion:³⁸

³⁵ This term *inhabiting* is directly from the work of transpersonal psychologist John Welwood, who suggests that humans can learn how to “inhabit” the body as a “field of presence” (Welwood 2008a, 2008b, 2008c).

³⁶ Spontaneity is known by the Chinese term *zì rán* (自然), or “of itself-so.”

³⁷ The Neo-Confucian style of meditation, *jìng zuò* (靜坐) or “quiet-sitting” is discussed at length in Chapter 6: Quiet-Sitting (*Jing Zuò* 靜坐) and Cultivation of the Self.

³⁸ my alternate translations appear in brackets.

Wishing to extend one's knowledge [complete wisdom], one must fathom principles [probe patterns] in each being, thing, or affair that presents itself to us...to fathom [probe] things to their utmost limit.

To fathom [probe] things to their utmost limit. After exerting himself for a long time, he will experience a breakthrough to integral comprehension...and having come to understand all things in their undifferentiated unity, in the end there is no distinctions of internal or external, fine or coarse, to speak of. (deBary 1985, 338–39)

How do humans “probe things [pattern] to their utmost limit” in this way? In this book, I argue that it can be done through sound, complexity science, depth psychology, and the Chinese philosophy of Confucius and Zhū Xī. These topics will be covered in Chapters 3, 6, and 7.

The purpose, method, and result of this probing of organic patterns to their utmost limit is explicitly described by Neo-Confucian Ch'eng Hao, in a letter on “Calming Human Nature“:

Everyone's nature is obscured in some way, and as a consequence, he cannot follow the [*dào* 道]. In general, the trouble lies in resorting to selfishness and the exercise of cunning.

Instead of looking upon the internal as right and the external as wrong, *forget the distinction*. When such a distinction is forgotten, the state of quietness and peace is attained. Peace leads to calmness, and calmness leads to enlightenment. When one is enlightened [functionally transparent],³⁹ how can the response to things become an impediment?

The sage is joyous because according to the nature of things before him he should be joyous, and he is angry because according to the nature of things before him he should be angry. Thus the sage does not depend on his own heart-mind [*xīn* 心] but on things [*wu* 物].

Does not the sage in this way respond to things? Why should it be regarded as wrong to follow external things and right to seek what is within?

Compare the joy and anger of the selfish and cunning man to the joy and anger of the sage. What is the difference? Among human emotions the easiest to arouse but the most difficult to control is anger. But if in time of anger, one can immediately forget his anger and look at the right

³⁹ Functional transparency is my term.

and wrong of the matter according to patterns [lǐ 理], he will see that external temptations need not be hated, and he has gone more than halfway toward the [dào 道]. (Chan 1973, 525–26)

Chou Dunyi, another Neo-Confucian scholar who was earlier in the Neo-Confucian lineage than Ch'eng Yi (see Chapter 2), supports these premises. Chou Dunyi said: “Having no desire, there will therefore be tranquility” (Chan 1973, 463).

Thus, these Neo-Confucian scholars are explicit in purpose, method, and result of this process of probing organic patterns to their utmost limit. Such probing means forgetting distinctions, not depending on one's heart-mind, and forgetting intense emotions. With forgetting distinctions and emotions, while attending to and uncovering of the innate internal and external organic patterns at depth, the result is tranquility. This tranquility affords the functional transparency previously described in “forgetting the self.”

Pattern/Principle (lǐ 理).

The ancient Chinese studied the organic patterns of the natural world from a different perspective than in the West. For the most part, Western philosophers have separated human beings from the divine,⁴⁰ and beginning in the seventeenth century have also separated them from nature. Ancient Chinese philosophers saw the cosmos as an organic whole, of which human beings could find harmony as a part of the whole. (e.g., Mote 1971, 19; Tu and Tucker 2003, 46). The discovery of harmony with the cosmos was done by the study of organic patterns in the

⁴⁰ But there are exceptions, like Plotinus and others.

natural world, which began with the study of the *Classic of Changes*, known as the *Yi Jīng* (易經), and popularly known in the West as the Wilhelm/Baynes edition *I Ching* with a foreword by C. G. Jung (Wilhelm and Baynes 1967).

The legendary Fú Xī (伏羲) in 3000 BCE, developed what are called “trigrams,” eight figures of combinations of three broken and solid lines that were representative of archetypes of the natural world. King Wen, the Duke of Zhou, and Confucius combined the eight archetypes into sixty-four hexagrams with changing and non-changing lines, (e.g., Legge 1893, 1963; Sung 1935, Wilhelm and Baynes 1967; Wu, 2007a, 2007b). Eventually, these hexagrams led philosopher Gottfried Leibniz to the development of the binary mathematics now used in all modern computers (Mungello 1977, 15, 21).

Everything in the cosmos has patterns (indeed, patterns within patterns within patterns), and the simplest meta-pattern is self-similarity (e.g., Bar-Yam, 1997). Self-similarity declares that the features seen in a larger pattern will be found in smaller and smaller sections of the larger pattern. In Chinese philosophy, the *tài-jī-tú* (太極圖) or “map of the Great Ultimate,” otherwise known in the West as the “Yin-Yang symbol” (Figure 1), is such a pattern (Marks-Tarlow 2012, 225, fig. 8.5).



Figure 1. *Tài-jí-tú* (太極圖; Klem 2007). Public Domain image retrieved from Wikimedia Commons.

In the natural world, a simple example of self similarity is a fern (Gleick 1987, 198, 238). In complexity science, a simple example is the Cantor set shown in Figure 2 (Gleick 1987, 93), which looks very much like the broken and solid lines of the *Yi Jing* (易經; see Figure 3). See complexity science glossary for further discussion on self-similarity.



Figure 2. “Cantor Set in Seven Iterations” (2007). Public Domain image retrieved from Wikimedia Commons.

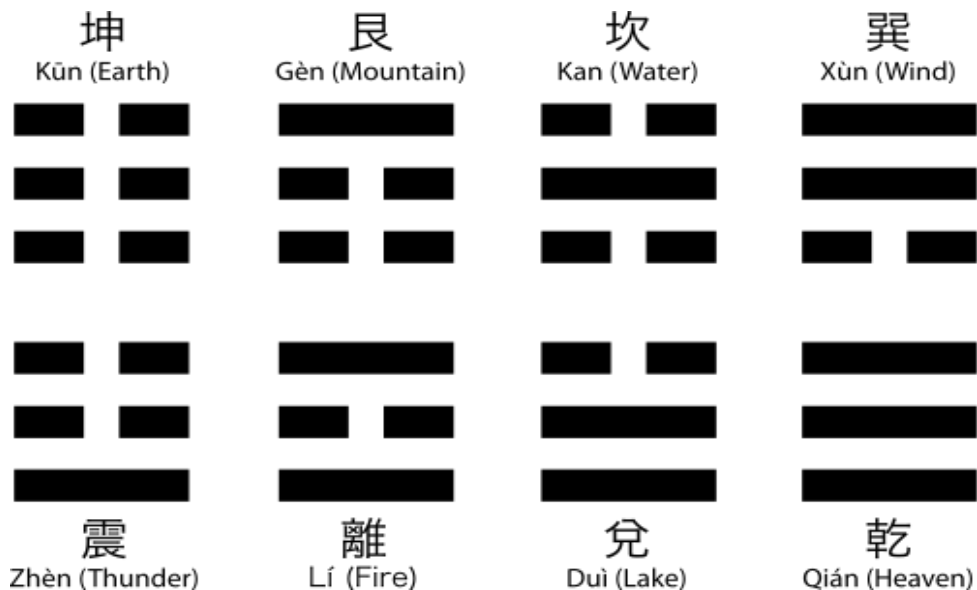


Figure 3. *Yi Jing* (易經) trigrams (Frater5 2007). Public Domain image retrieved from Wikimedia Commons.

Fathoming or Probing (qióng 窮).

The Chinese character *qióng* (窮) literally means “to dig out.” Zhū Xī referred to the Cheng brothers in saying that access to the larger organic pattern was a matter of simply *uncovering* (or digging out) the already existing internal patterns within one’s self; these internal patterns were found, by resonance, to be the same as the organic patterns of the cosmos. This uncovering could be done, according to Zhū Xī, by study of texts for half the day and by quiet-sitting (*jìng zuò* 靜坐) half the day, observing the patterns of the cosmos and of the self. Through this study and sitting regimen, after a while one would see how the patterns inside and patterns outside were the same (Ching 1986, 282–84).

Through complexity science and the use of modern computers, it is now possible to graphically attend to the infinite details of the natural organic patterns of nature, self, and cosmos (see Chapter 6 for further discussion). This is the basis of drawing the parallels I have drawn in this book.

Structure: Three Themes through Six Chapters

In keeping with the topics of this book, I allowed the structure—that is, the pattern—of this writing to coalesce and evolve organically. As the writing unfolded, three themes emerged that are presented through six chapters following the introductory chapter. Each theme is grounded (and therefore discussed in its full depth) in one particular chapter, but all themes appear in all chapters. In service of this structure, I make opening remarks on a variety of topics which are of an introductory nature, and serve to begin to acquaint the reader with a

particular topic. There is a sort of holographic sense of how many of these topics show up, each with their own potential and contribution to the whole of the book.

The three themes are Self, Parallels, and Resonance/Harmony, woven together in six chapters following the introductory chapters: Chapter 2, Zhū Xī and Neo-Confucianism; Chapter 3, Etymology of *Lǐ* (理; organic pattern); Chapter 4, Complexity Science and Fractals; Chapter 5, Parallels of Chinese Philosophy and Complexity Science; Chapter 6, Completion of Wisdom; and Chapter 7, Epilog: Harmony and Resonance. The theme of Self grounds in Chapter 6: Completion of Wisdom, the theme of Parallels grounds in Chapter 5: Parallels, and the theme of Resonance/Harmony grounds in Chapter 7: Epilog: Harmony and Resonance. While I make certain linkages between the points presented, it is hoped that the reader will be drawn to come to states of personal awareness that build upon those connections, and that are not explicitly detailed here.

The Theme of Self

While the psyche or self has been widely discussed as a philosophical concept in the West, complexity theory and fractal geometry can be useful in metaphorically modeling emergent, patterned attributes of the self. Fractal geometric patterns have been shown “for all practical purposes to be infinite” (Mandelbrot 1983, 1), and therefore modeling of the psyche or self through fractal geometry may also be infinite in possibility. Clinical psychologist Dr. Terry Marks-Tarlow (1999) discusses the dimensions of the self in a complexity context:

If psychological health rests at the edge of chaos, then our infinitely deep fractal edges may be...a source of renewal, inspiration, and creativity.... Processes of self-exploration and meditation are potentially endless, recursive endeavors....The common character, indeed wonder, of fractal boundaries may be best reflected in the belief, common among transpersonal psychologists, that the true Self contains worlds within worlds that reflect the equally-expansive landscapes of outer worlds. (341)

Marks-Tarlow opens exciting possibilities for understanding psychological health and the structure of the psyche or self, through fractal geometry.

It is important to note that the approach of human beings to understanding the cosmos is basically anthropocentric, as it must be by our very nature as human beings (see Chapters 2 and 6 for more discussion on this topic). I have found the theme of “self” to be curiously resistant to concise description.

Chinese cosmogony is organismic, meaning that “all parts of the entire cosmos belong to one organic whole and that they all interact as participants in one spontaneously self-generating process” (Mote 1971, 19). Therefore, the idea of a “self” in Chinese philosophy is very different from that of the individual human being in the West. For example, when I first began to explore the Chinese idea of the “self,” I found that the basic social unit in China is the family, rather than the (Western) individual.

In my research, I came across numerous titles of books and articles in English attempting to grapple with this difference between the Chinese and the Western understanding of “self.” Ames, Dissanayake, and Kasulis (1993) declare,

the Chinese perception of physicality can be shown to be so far removed from our own (Western) assumptions that an exploration of the differences can be an occasion to appreciate the degree to which the Chinese are a truly different order of humanity. (149)

A few of the authors and titles I found most useful are Ames, Dissanyake, and Kasulis's (1993) *Self as Body in Asian Theory and Practice* and *Self as Person in Asian Theory and Practice* (1994); Ames, Kasulis, and Dissanayake's (1998) book *Self as Image in Asian Theory and Practice*; Harvard sinologist Tu Wei-Ming's (1985) *Confucian Thought: Selfhood as Creative Transformation*; Munro's (1985) *Individualism and Holism*; deBary's (1991) *Learning for One's Self*; and the work of my dissertation chair, Dr. Yi Wu (2012), *Self and Mind: Integral Life Psychology*.

As the topic of "the self" is so vast, I restrict my focus here to the self as expressed in the Confucian ideas of the "Four Books," primarily *The Great Learning* and *The Doctrine of the Mean*. In these texts, Confucius addressed the problem of "the self" not so much as a descriptor of an individual social unit, but as actions (by individuals, family and social groups, communities, and nations) to be taken in context with the cosmos. I contend that *The Great Learning* is an exercise in developing flexibility of awareness across multiple scales of being that is the cosmos.

Through modern computer mathematics and modeling, infinite organic patterns are now being shown as present not only in the physical world (Lorenz 1963; Mandelbrot 1983), but also in the self in psychology (Robertson and Combs 1995; Gustatello, Koopmans and Pincus 2009) and Western philosophy (Heylighen 2006). Paradoxically, then, another reading on Pythagoras' basic ideas of the cosmos as number (e.g., Wertheim 1995) is becoming available in the West

with the advent of complexity science and its dis-covery⁴¹ of infinite organic patterns. One can attend to mathematics as but one mode of attending to the infinite organic patterns that are the cosmos. What is mathematics but an anthropomorphic study of patterns (e.g., Boyer 1991 2; Lakoff and Núñez 2000, 2–4, 15; Mandelbrot 1983)?

In my training as a psychologist and hypnotherapist, my understanding of the terrain of the self is through the depth psychology of French psychologists Janet (1925), Bernheim (1964), Charcot (see Owen 1971), and later Freud (1955) and Jung (1953–1967). Yet, I was entirely captivated by the work of Terry Marks-Tarlow (1999) and her article *The Self as a Dynamical System*, where she declares,

Sciences of chaos and complexity theory reveal new universalities in nature applicable to psychology. This article proposes that the psychic structure long known as the “self” is best conceptualized as an open, complex, dynamical system. (311)

In Chapter 5, I show how this and other work on complexity science, particularly in psychology, parallels the work of Confucius.

The Theme of Parallels

In this book I argue that there are insights to be gained in Chinese philosophy and complexity science, from each reflectively observing parallels in the other, to illuminate what were previously enigmatic patterns in both. Though complexity science is a mathematical field, I find there are patterns that are easily available and comprehensible to the layperson, without training in advanced

⁴¹ By “dis-covery,” I refer to uncovering.

mathematics (see Chapter 6). In complexity science, I look to Mandelbrot's (1977, 1) work with "roughness" as well as Conforti (2003) and Mandelbrot (1983), and find parallels in what Confucius, Cheng Yi, Cheng Hao, and Zhū Xī did with self and organic pattern (e.g., Munro 1985; see also Chapter 6). Needham (1956) also makes the link with translating 理 as "organic pattern," as discussed above.

The Theme of Resonance and Harmony

To discuss resonance and harmony, I use the analogy of music, as have scholars of both Western science and Chinese philosophy. Resonances are the notes, and harmonies are the context and relationships in which the notes are sounded. How are resonance and harmony relevant to natural organic pattern and parallels between ancient Chinese philosophy and complexity science? *Harmony* is the context and relationship found within natural organic pattern, and *resonances* are the inseparable self-similar parts within that context.⁴²

As shown in Chapter 7, resonance and harmony serve the process of the completion of wisdom—of cultivating the self in an attuned and resonant state of non-cognitive transparency in context with the cosmos. These functions serve to bridge many of the found parallels in Chinese philosophy and complexity science, and bring these topics to somatic and vital, vibrant, relational, and contextual dimensionality within the whole.

⁴² Examples of resonance are offered in Chapter 7.

Accessibility

In the conversion of a doctoral dissertation into a book, one can only begin to touch briefly on parallels and resonances between complexity science and Chinese philosophy; each of these themes and chapter topics deserve a much broader exploration that is beyond the scope of this book. While my understanding of advanced mathematics continues to develop, along with my understanding of Chinese language, I believe that the ideas here are accessible and have relevance to readers of this material who may have interest, yet be uninformed, in these topic areas—without the need for advanced mathematics or fluency in Chinese.

Methodology

This book uses an interpretive, hermeneutic methodology (e.g., Messer, Sass, and Woolfolk 1988) to examine both primary and secondary sources on relevant aspects of Chinese philosophy; as many works on complexity theory and fractal geometry were written recently in English, those sources are primary. Specifically, I utilize a limited number of primary Chinese texts, making my own translations and interpretations of certain characters and phrases in order to unpack, illustrate, and explore the embedded and implicit meanings of various tenets of Chinese philosophy.⁴³ Secondary English translations of source material

⁴³ See introduction of Chapter 6 for my ideas about translation theory.

are also used. This first chapter presents the methodology for this book and the limitations and delimitations of this work.

The Hermeneutic Circle

As a methodology, I used the *hermeneutic circle*, which is a movement between the parts and the whole of a text as a way to interpret the text and find meaning (Ramberg and Gjesdal 2005);⁴⁴ this hermeneutic circle is also constructed of my own synthesis. The ontological hermeneutics of Heidegger and Gadamer (as cited by Ramberg and Gjesdal 2005)⁴⁵ are foundational to this book, and semiotics (Korta and Perry 2011; Marks-Tarlow 2004)⁴⁶ also play a role.

As I have been a piano technician, hypnotherapist, Western astrologer, and student of the *I-Ching* for more than forty years, and a community and post-divorce mediator for more than twenty years, I bring to this project numerous tools of analysis with which to address patterns in philosophical texts and ideas. The approach I bring aligns with Wendy Doniger O’Flaherty’s (1980) metaphor of a pluralistic and eclectic methodological toolbox. Tuning and maintaining

⁴⁴ From the *Stanford Encyclopedia of Philosophy* on Hermeneutics:

There is an analogy, Spinoza claims, between our understanding of nature and our understanding of the (Christian) Scriptures...Our understanding of the parts hinges on our understanding of a larger whole, which, again, can only be understood on the basis of the parts. (Ramberg and Gjesdal 2005, “The Beginnings of Hermeneutics,” para. 6)

⁴⁵ Ontological hermeneutics is a way of perceiving and interacting with openly, through dialog, to various positions on meaning, rather than insisting on the sole validity of one’s own position, which allows new truths to emerge in a dynamic way (Ibid.).

⁴⁶ Semiotics relates language to other sign systems, both human and nonhuman, in a cyclic fashion. This makes one metaphoric system accessible to another (Korta and Perry, 2011).

pianos and their owners,⁴⁷ working with clients to develop self-hypnotic states, assessing planetary patterns and the relationships of those patterns to archetypal and psychological states, and acting as a mediator by bringing salient points to the surface in many kinds of disputes (business, personal, interpersonal, family, and community) that all parties can acknowledge—all this has supported my development of significant skill as a troubleshooter in assessing patterns of harmony and disharmony within a situation, client, or instrument. In addition, this toolbox extends to how exactly to act to re-potentiate an interplay of those patterns for optimum functioning in a setting, situation, client, instrument, or reader; as Wendy Doniger O’Flaherty (1980) says, it is important to know which is the right tool or combination of tools for the job.

In addition to my life experience, my cognitive preferences also support my choice of topic and methodology. According to the expanded 32-pole model of Walter Lowen (Lowen and Miike 1982), developed from Jung’s quaternio of personality types, my native personality type is a “theoretician,” one who attempts to “strategize the pattern” (Lowen and Miike 1982, 109). This strategizing involves exploring and developing organic patterns from the infinite—which both Chinese philosophy and complexity theory (which includes fractal geometry) do in their own way.

⁴⁷ Yes, I do attune and maintain the owners of pianos as well as their instruments, through psychological support of the client’s perception and interaction with their piano as well as my technical skill of working with the piano itself.

In my application of this methodology, the intention is for the reader to embark upon a deepening understanding of the organic patterns of the cosmos, and thus of self and harmony of one's-self in the cosmos. It is my hope that the resulting understanding will extend far beyond the introduction of this material through this book.

It is as if the reader is handed a small corner or piece of a hologram. Spread across the entire piece of hologram film is all of the information about the entire hologram. With just a small corner, all of the information about the hologram is present, yet the picture is fuzzy and indistinct. As one adds further pieces, the hologram remains the same, yet the quality of focus, sharpness, and depth increases markedly.

The following quote from the *Analects of Confucius*, Chapter 7, Verse 8, speaks to the point of engaging with material in this way:

The Master said, "I do not open up the truth to one who is not eager to get knowledge, nor help out any one who is not anxious to explain himself. When I have presented one corner of a subject to any one, and he cannot from it learn the other three, I do not repeat my lesson." (Legge, 1893, 197)⁴⁸

Confucius's words suggest that the meaning of the whole is available in its parts (i.e., "one corner of a subject"), and that those who have sufficient interest will be

⁴⁸ I present the Chinese text for explicit linguistic reference of this verse, so the meanings are not lost in translation to English: 子曰：不憤不啟，不悱不發，舉一隅不以三隅反，則不復也。 Literally: "Master said: Not resent not open, not speak not say, recommend one corner not use three corner (to) reason (by analogy), lesson not return also" ("Confucianism: The Analects; Shu Er, Verse 8" 2013).

able to find the meaning of the whole from “one corner.” In the hermeneutic method, the more a researcher delves into a topic, the more is understood, and greater focus and depth become available on the topic (e.g., Gilhus 2011, 276).

Another layer that changes and deepens over time with this method is the presuppositions that the researcher brings to the topic. Careful researchers attempt to become as aware as possible of their presuppositions, cultural habits, and filters about a topic, before engaging with it. It is also important to be aware of the ways the presuppositions of the researcher will change with engaging the topic. Researchers will also find presuppositions in the literature, and have a critical assessment of the validity and reliability of all presuppositions, as much as is possible. Many personal and cultural presuppositions are unconscious, and only come to light when contrasted with the offerings of others, in a critical assessment (e.g., Gilhus 2011, 278).

Piano Tuning as Hermeneutic Method

I find a useful analogy, with regard to the Hermeneutic method, in how I approach a piano to tune it. I start with an idea in my mind about what I think the ideal piano sound should be, what to do with that particular piano (Teki et al. 2012)⁴⁹ to bring it to an optimum condition and functionality in its environment, and what the piano owner wants. However, as the piano and I interact with each other, I have to learn what the piano “wants,” along with what I think it should be doing, and to understand the difference.

⁴⁹ By “what to do,” I mean how interact with the piano, in relationship to what it is doing and what I think I want.

When I set the twelve notes of the reference octave on the piano, from which all other notes on the piano are tuned, I start by tuning one note on the piano to a single pitch from a tuning fork, usually $A = 440$ Hz. I then begin to set and establish all other intervals in a specific pattern.⁵⁰ However, this pattern is only a theoretical idea of the spacing of—or intervals between—the notes. There is a difference between what I have in mind, what the designer had in mind when she or he drew the blueprints for the design of the piano, and what the actual execution of the piano is in physical reality (i.e., what the piano actually “wants”). Part of my job is to discover what the piano “wants” that is different, in subtle ways, from what the designer and I think “should” be the case for how the reference octave is established. When I find what spacing and balancing of intervals (through tests and checks of beat frequencies) the piano “wants,” and accommodate that to the theory of what I know, the sound of the piano seems to “open” to a balanced state.

When I do understand the difference, then I can more successfully and with much less effort guide the piano and allow myself to be guided *by* it. Eventually, the piano reaches *functional transparency*, where it doesn’t get in the way of music being played upon it. The expression of the player moves from body and hands, through the piano, as harmonious sound—that is the best that both of them can do, in the room that they are in. (I believe this kind of balancing

⁵⁰ I primarily use *Equal Temperament*, where each of the twelve half-step notes of the octave are spaced equally within the octave; each half step is 1/12th of the octave.

and functional transparency is available to human beings, and is described by Confucius in the *Doctrine of the Mean*, which I explore in Chapter 3.)

This method of establishing a pattern (of notes, intervals, in a balanced way) on a highly tensioned⁵¹ system is analagous to the hermeneutic method. In hermeneutics, one approaches a topic with certain ideas about what the topic “means,” and then through repeated rounds of exposure, contemplation, and work with the topic to come to know the “topography”⁵² of the topic, one’s understanding deepens and opens. The topic no longer holds the same meaning as it did when one initially entered with preconceived ideas. One has experienced a kind of dialectic with the topic that allows a subtle yet profound opening to occur (e.g., Gilhus 2011, 275–84; Messer, Sass, and Woolfolk 1988; Ramberg and Gjesdal 2005; Schmidt 2006; Vanhoozer, Smith, and Benson, 2006). The idea is for the researcher to become a participant in the extraction and formation of meanings of texts, in a circular fashion; similar to my work with the piano, meaning deepens and broadens in scope and depth.

Holographic Layers of Meaning

It is not my purpose in this section to offer a comprehensive history or a detailed analysis of the various and deep threads of modern Western hermeneutics that have developed in Western philosophy. My purpose is to introduce the reader

⁵¹ Each piano has 15-40 tons of tension from the strings, depending on the size of the piano.

⁵² See Chapter 3 on “topography.”

to the spirit of hermeneutics, which I am coming to understand is to always develop one's own model for assessing meaning.

The hermeneutic method is multifaceted, with the simplest idea of hermeneutics and exegesis being interpretation. What does the text *mean*? What are the meanings? Why do people need to transfer meanings, how is meaning embedded and carried by text, and what is the context of the text? In the fields of philosophy and religion, writers attempt to convey information that is beyond cognition, beyond rationality; I propose and speculate that such information is holographically embedded into texts (e.g., Gilhus 2011, 280).

Even in the first approach to a text, one will have certain conscious and unconscious presuppositions, habits, and biases, and a mirroring effect occurs as one interacts and attempts to interpret a text. There are myriad ways to convey meaning, and the structure and context of a particular language facilitate the conveyance of information and meaning. It is important to say here that the assignment of meaning is entirely arbitrary. The arbitrary assignment of qualities and cognitive structures is dependent upon the conscious and unconscious personal and cultural prejudices of the interpreter (e.g., Gilhus 2011, 280).

Chinese has a curious and notorious quality of contextuality and multiply embedded meanings. As a modern reader, one is unable to completely grasp the intended and enfolded meaning of ancient texts, as one does not live in those times or in that culture and language. However, I propose that there are global and

ecological⁵³ states of being that have a universal quality. In the time of the so-called axial-age (800 to 200 BCE⁵⁴), a number of notable people (e.g., Confucius, the Buddha, and Lao-Tzu) had a remarkable access to these states and encoded their experiences in teachings and texts. I argue that such states are as available to present-day people as to those who lived thousands of years ago.

As a modern reader, one can only discover (and resonate to) what these texts mean in the present time. When opening a Chinese text, one can begin to understand it as a cloud of arbitrary meaning and attend to the problem of holographic encoding through an exploration of what I have come to call “mystical presuppositions,” which serve as references to illuminate deeply embedded and multilayered meanings (see Chapter 6 for further discussion).

While some authors are concerned about the “misunderstanding” of a text in favor of a “correct” understanding, I am more interested that readers find their own understanding. My hope is for readers to not only discover that the linguistic structures of both Chinese philosophical texts and complexity science offer illumination, but also find personal participation with the non-cognitive ideas and possibilities that are *pointed to* by any textual, metaphoric, or visual representation.

⁵³ By *ecological*, I refer to how people blend with their particular environment and context.

⁵⁴ The term *axial age* to refer to the time period of 800–200 BCE for remarkable world figures, such as the Buddha, Confucius, Lao Tzu, and Zarathustra, was first suggested by philosopher Karl Jaspers (Jaspers 1953, 8).

Hermeneutics thus is a task for the reader as well as the scholar–writer. If readers avail themselves (as much as possible) of a willing suspension of conscious and unconscious presuppositions and judgments, along with a suspension of dis-belief, I suggest that they will find a personal, non-cognitive, fractal, semiotic topography unfolding in their understanding—an awareness that neither reader nor writer had any idea was the case before having begun their participation in the work.

Limitations and Delimitations

A primary limitation of this work is that I am not a mathematician. To ensure that my understanding of the mathematical tenets I explore was reviewed by an expert, I chose Dr. Terry Marks-Tarlow, who has published extensively in her field (see Marks-Tarlow 1999, 2004, 2008a, 2008b, 2010, 2011, 2012).

Two main delimitations apply to this book. First, I do not discuss the self as a philosophical construct, nor do I attempt to include all of complexity theory, fractal geometry, or Chinese philosophy. Second, I limit myself to basic tenets of complexity theory and fractal geometry, and to basic tenets of Chinese philosophy, along with specific concepts from the *Great Learning* as explored by particular Neo-Confucian scholars, as stated above.

Chapter 2: Neo-Confucianism

For an appropriate context in which to discuss Neo-Confucianism it will be necessary to give a clear picture of the philosophy of Confucius. First I discuss Confucius and Confucianism as originally developed by Confucius, during the “Warring States” period in fifth-century BCE China. Confucius’s original teachings were known as the *Rú Jiā* (儒家), or “School of the Scholar” (e.g., Yao 2000, 7). Following Confucius’s death in 479 BCE, Confucianism continued to develop—and has had significant influence throughout East Asia to this day. Dr. Yi Wu’s (2009b) comments on Confucianism allows scholars and students to make their own personal connection with Confucius’s teachings and scholarship. Such a personal connection with the deep tenets of Confucius renders a deeper dimensional understanding of the work of Confucius. I look at the lineage of Confucianism with Mencius or *Mèng Zǐ* (孟子) and *Xún Zǐ* (荀子), who play significant roles in the development of Neo-Confucianism. I then look at selected Neo-Confucian Masters, and talk about their contributions to Neo-Confucianism, all of which went to support the developments of the scholar Zhū Xī, who is a focus of this book.

Confucius

The name Confucius is a Europeanized version of the name *Kǒng Fūzǐ* (孔夫子) or “Master Kong,” which was changed to “Confucius” by the Jesuit

Fathers⁵⁵ who first came to China in the late 1500s and studied the texts of Chinese philosophy (Yao 2000, 1). As the name “Confucius” is so well known, I use this name throughout this book.

Confucius was born in 551 BCE in or near the city of *Qūfū* (曲阜), in the state of *Lǔ* (魯), in what is now *Shāndōng* (山東) (literally “East Mountain”) province. According to some (Lin 1938; Riegel 2006), his ancestors were of the Royal State of Song. His warrior father died when Confucius was three years old, and his family was impoverished. He “was forced...to take petty jobs (such as accounting and caring for livestock” (Riegel 2006, para. 4). He married at nineteen, and at twenty-five he began a school for boys. (Day 1962, 29). When Confucius was fifty, he was appointed a Minister of Public Works and then Minister of Crime, but was soon thereafter forced to leave his posts from political jealousy and had to leave *Lǔ* (魯) State as well. He traveled to a number of other states trying to find a ruler who would hire him, and was unsuccessful. Confucius returned to *Lǔ* (魯) State in 484 BCE, to again begin teaching (Riegel 2006).

Confucius spoke of his own developmental process as a philosopher in the *Analects*, which is a record of conversations between Confucius and his students.

At fifteen, I set my mind to learning. At thirty I could stand [on my own two feet]. At forty, I was beyond doubt. At fifty, I knew what Heaven’s destiny held for me. At sixty, I listened undisturbed. At seventy, I could do whatever pleased me without fear of impropriety. (Li 1999, 20)

⁵⁵ Matteo Ricci (1552–1610) and fellow missionaries, who upon their arrival in China in the late 1500s followed Buddhism, but then found Confucian scholars were most respected by the social elite in Chinese society, and began to emulate the Confucians (Yao 2000, 1).

Confucius continued developing the “spirit of Chinese philosophy” that had been in place before him—known as the School of Rú (*Rú Jiā* 儒家). The above selection from the *Analects* not only describes Confucius’s developmental stages as he progressed in the path of “becoming a sage,”⁵⁶ but is a guide to self-development for students of Confucius. To go into a detailed discussion of this passage of the *Analects* is beyond the scope of this project.

(Confucianism and the) School of Rú (儒家)

Yao (2000) reports that *Rú Jiā* (儒家)⁵⁷ means “the doctrine, or tradition, of scholars,” and that Liu Xin of the Han dynasty suggests *rú* (儒, scholarship) was first engaged in as a way of life in the Zhou Dynasty (e.g., Yao 2000, 7, 17, 29, 30). *Rú Jiā* (儒家) focused upon the “Six Classics,”⁵⁸ and on *rén* (仁, humanness), *yì* (义, righteousness), and following the ancient sage-kings.⁵⁹

According to Dr. Y. Wu (2009a), Confucius continued developing three

⁵⁶ Becoming a sage and embodying “the spirit of Chinese philosophy” were the goals of the practitioners of Chinese philosophy. Perhaps becoming “sage-like” is a more accurate description, as Chinese philosophy is rather other than goal-oriented as such (e.g., Gardner, 1990). A sage-like person is more and more someone who cultivates themselves (e.g., Ching 2003, 81; de Bary and Bloom 1999, 301) to be in harmony (see the discussion on harmony in Chapter 7) with the cosmos. The practice of being at harmony with the cosmos was thought to have begun with the Yellow Emperor, and the legendary sage-kings Yao and Shun, whom Confucius sought to emulate (e.g., Tu 1985, 119). See footnote 59 below.

⁵⁷ See Chinese Glossary for explanation characters of *Rú Jiā* (儒家).

⁵⁸ The Ancient “classics” of Chinese philosophy; *Classic of Odes*, *Classic of History*, *Classic of Changes*, *Classic of Rites*, *Spring and Autumn Annals*, *Classic of Music*.

⁵⁹ Fū Xí (伏羲), Emperor Yellow (黃帝), Emperor Yao (堯), Emperor Shun (舜).

characteristics of Chinese philosophy: happiness in mind, transmission of the *Daò* 道, and beauty of life. The facets of the spirit behind the three characteristics are concerned mind (*guān xīn* 關心), and righteousness (*yí* 义), daily renovation, and the cultivation of sincerity (*xiū chéng* 修誠).

Confucianism is the term used to describe the humanistic and ethical philosophical system or “school” developed from writings and teachings of Confucius. Several hundred years after Confucius’s death in 479 BCE, the difficult warring states period of the Zhou Dynasty, *Zhōu Cháo* (周朝) ended with the short-lived Qin Dynasty, *Qín Cháo* (秦朝) 221 BCE. The ruling style of the Qín dynasty was based on legalism, which was a system that followed the ideas of philosopher Xún Zǐ (荀子). One of the main tenets of Xún Zǐ’s philosophy was that people were basically evil, and could only be brought to moral order through laws and punishments.⁶⁰ After the Qin Dynasty fell in 206 BCE, Confucianism was adopted by the Han Dynasty or *Hàn Cháo* (漢朝) as a system of moral order, and had a significant role in Chinese governance and philosophy up to 1905 CE (e.g., Chan 1973, Tu and Tucker 2003, Yao 2000, Wu 2009b). Chan (1969) reports that “Confucianism became the state ideology in 136 BCE” (379). When the Han Dynasty dissolved in 220 CE, influences of Buddhism and Daoism became more prominent in China. A newly configured Confucianism re-emerged

⁶⁰ That human beings were basically evil and needed to be controlled by laws and regulations is in direct contrast to the Confucian disciple Mencius, who felt that human beings were basically good (e.g., Chan 1973, Tu and Tucker 2003, Yao 2000, Wu 2009b).

in the Táng (*Táng Cháo* 唐朝) and Sòng Dynasties (*Sòng Cháo* 宋朝) known as *Lǐ Xue* (理學), or the “School of Principle,” in China, (known as Neo-Confucianism to Westerners), that combined Confucianism with elements of Daoism and Buddhism. Zhū Xī derived *The Four Books* or *Sì Shū* (四書) from the *Classic of Rites* or *Lǐ Jì* (禮記) in 1170 CE. *The Four Books* (which included Zhū Xī’s commentaries on each of the Books) became the basis for imperial civil service examinations in China until 1905.

Prominent Neo-Confucianist (and immediate forerunner of Zhū Xī) Zhāng Zǎi (張載; 1020-1077) defines Confucianism with three meanings (Y. Wu 2009b, personal communication with author, July 6, 2013): it is “tender,” which means gentle action; it is “enriching,” in the sense of cultivating virtue,⁶¹ and it involves “waiting,” that is, waiting to teach (until asked). The “responsibilities of Confucianism” are to establish the heart-mind (*xīn* 心) for heaven (*tiān* 天) and earth (*dì* 地), thus allowing the heart-mind to communicate with heaven and earth, to purify the living space, to sublimate the spirit, and to serve as a root for morality. The principle of heaven and earth gives life to all beings, helps them to develop, and maintains life’s (heaven’s) destiny (*tiān mìng* 天命) for all people. Fulfilling these responsibilities allows people to establish a life of wisdom and

⁶¹ The character for virtue is *dé* (德). It is made up of several parts. The lines on the left of the character are a simplified version of *xíng* (行), which means “conduct.” The parts of the right side of the character are from top to bottom, *shí* (十) “ten,” *sí* (目) “eyes,” *yí* (一) “one,” and *xīn* (心) “heart.” Virtue is where one’s conduct is when the intention or “heart” of the conduct is the same as if people were watching one’s behavior. “Conduct: ten eyes, one heart.”

continue the subtle (or “lost”) teachings (*júe xué* 絕學). The purpose of these subtle teachings are to transmit the *Dào* (道), to comment on the classics, and to respect the teacher, and following them brings peace for ten thousand generations (Y. Wu 2009b).

Confucius is said to have compiled and edited the Six Classics, of which only five survived the “burning of the books” in the short-lived Qin dynasty in 213 BCE (Koeller 2003). These five classics are the *Classics of Rites, Changes, History, Odes, and Spring and Autumn Annals* (also a historical text); the lost text is the *Classic of Music*.

Two of the primary texts of ancient Chinese philosophy are the *Classic of Changes* (*Yi Jīng* 易經) and the *Classic of Rites* (*Lǐ Jì* 禮記). *The Classic of Changes* began as a book of divinity, and the 64 hexagrams of the *Yi Jīng* 易經 are said to have been written by King Wen (*Zhōu Wén Wáng* 周文王)⁶² from trigrams first developed by Fú Xī (伏羲). The Duke of Zhou (*Zhōu Gōngdàn* 周公旦) then wrote commentaries on each of the lines of the hexagrams. It was Confucius who developed the *Yi Jīng* 易經 into a book of philosophy, turning the “Way of Heaven” (*tiān dào* 天道) into the “way of humanity” (*rén dào* 仁道) by his commentaries known as the *Great Appendix* or *Ten Wings* (*shí yì* 十翼; e.g., Y. Wu 2009c).

⁶² Founder of the Zhōu Dynasty, 1099–1050 BCE.

The *Classic of Rites* (*Lǐ Jì* 禮記) is a collection of documents from the Zhou dynasty prescribing “rules for ceremonial etiquette on public and private occasions” (Day 1962, 29). Though concerned with rules for how to act, Behuniak (2008) finds that Confucius has little patience for those who engage in the rules *without* vitality, as was known by earlier, less formal people (*yě rén* 野人; see Behuniak 2008, 52).⁶³

Ritual serves to establish excellence by maintaining the forms and institutions that enable its development. Such forms are not coercive; rather, *they generate the positive freedom to achieve the cultivation of one’s unique abilities* [italics mine]....To understand the function of ritual form, this conceptual link to the aesthetics of harmony (*hé* 和) must be recovered....As Master You reminds us: “Achieving harmony (*hé* 和) is the most important function of ritual (*lǐ* 禮) (*Analects* of Confucius 1.12).” (Behuniak 2008, 52–54)

It is the *freedom* to act in ritual, that helps develop a fluid rather than static ritual *lǐ* (禮). Such vitality in ritual *lǐ* (禮) suggests a method by which one can engage and harmonize⁶⁴ with the present moment with a life-giving *vitality* of the natural world. Such ritual must be continually developed afresh, in alignment with circumstances and occurrences unfolding in the natural world in the present. Vital ritual is formal action designed to participate *in* the natural world, without rigidity or out-dated forms that amounts to dogma, in a way that harmonizes with expression of the cosmos. Rites and ritual practiced in this way provides the local

⁶³ This is referring to the *Analects* of Confucius, Chapter 11, verse 1.

⁶⁴ See the epilog for a discussion on harmony.

participant with the support of the entire cosmos, from that harmony with the cosmos.

The *Classic of Rites* or *Lǐ Jì* (禮記) is one of the “Five Classics” of ancient Chinese philosophy. In 1170 CE, Neo-Confucianist Zhū Xī compiled and commented upon selections from the *Classic of Rites* or *Lǐ Jì* (禮記). Zhū Xī’s compilations are known as the “Four Books” or *Sì Shū* (四書). The four books played a pivotal role in Chinese philosophy from the twelfth to the early twentieth century. The Four Books are *The Great Learning* (*Dà Xué* 大學), which is a document of political advice; *Mencius* (*Mèng Zǐ* 孟子), a treatise by a disciple of Confucius;⁶⁵ *The Analects* (*Lún Yǔ* 論語), conversations Confucius had with his students; and *The Doctrine of the Mean* (*Zhōng Yōng* 中庸), a psychological text (e.g., Gardner 2007). While I do look at selections and information from the other Four Books, a primary focus in this book is a key sentence in the *Great Learning* (or *Dà Xué* 大學).

A Lineage of Confucian Masters

Two important philosophers follow Confucius. These were Mencius⁶⁶ (*Mèng Zǐ* 孟子, 372–289 BCE) and Xún Zǐ (荀子; 312–230 BCE); these two were almost a counterbalance to each other. They lived during the Warring States

⁶⁵ One of Mencius’s important tenets was that human nature is basically good. *Mencius* 7A: 15 (Lau 2003, 291).

⁶⁶ This name has been Westernized by the Jesuits, in the same way as Confucius. Since Mencius is more familiar to English speakers, I use Mencius throughout.

period (*Zhànguó Shídài* 戰國時代, 475–221 BCE) and contributed to the “Hundred Schools” of Chinese philosophy (e.g., Chan 1973, 55).

Mencius (Mèng Zǐ 孟子)

Mencius was a primary interpreter of Confucianism, said to have been a student of Zisī (子思), Confucius’s grandson. In contrast to Xún Zǐ, Mencius felt that people are inherently good and that education is the key to bringing the natural goodness in people to an outward expression by individuals (e.g., de Bary and Bloom 1999, 115). Mencius emphasized the value of the common people—the lineage of Mencius’s teachings was adopted by the Neo-Confucians (e.g., Chan 1973, 49–51; de Bary and Bloom 1999, 116–58; Fung 1997, 8–9, 409–12; Lau 2003). *Mencius* was one of the “Four Books,” as compiled by Zhū Xī. (Gardner, 2007, 53–106).

Xún Zǐ 荀子

Xún Zǐ felt that human nature is inherently bad, and that moral training is needed to curb the evil in human nature and bend it to the good. Due to the inherently evil quality in human beings, moral training (emphasizing *lǐ* 禮: propriety or rites) was, to Xún Zǐ, the only way to prevent society from falling into chaos (e.g., Chan 1973, 232). His emphasis on preserving order extended to language itself, demonstrated by his work on the Rectification of Names (*Zhèng Míng* 正名; “correct naming”).

During the fifth to the third centuries BCE there was a proliferation of philosophical schools, known as the “Hundred Schools” of Chinese philosophical thought (Fung 1997, 30). Being that Chinese language is ideographic (picture

writing) and paranomasic or multilayered in meaning (Ames 2008, 37–48), without an appropriate context and spoken intonation, words can have different and sometimes obscured or strange meanings. (Fung 1952, 203, fn 206; Chan 1973, 124). In this section, words are spoken of as “names.”

In his treatise on the Rectification of Names, Xún Zǐ declares the importance of clarity of communication. The sage-kings were clear with their meanings of words, and so what they said to the people was understood and carried out. During the “Hundred Schools” period there were some philosophical practitioners of the “Hundred Schools” who sought to manipulate the populace through confusion and strange meanings of words (Chan 1973, 124). Thus the “rectification of names” or re-clarifying of words [names] and linguistic meaning⁶⁷ was considered critically important for good government and a stable populace, both by Confucius and later by Xún Zǐ. As will be seen, the exercise of clarifying of language was carried to an extreme by legalists, who sought to control the populace through “logical means” (Chan 1973, 251–52).

Confucius referred to correct naming in Chapter 12 verse 11 of the *Analects of Confucius*. In Chapter 12, verse 11, Confucius was asked about correct governance. Confucius said “When the sovereign is the sovereign, the minister is the minister, the father is the father, and the son is the son⁶⁸ [then the

⁶⁷ Clarifying of “names” is what Confucius is doing when he says “When the Son is the Son and the Father is the Father” (Li 1999, 143) combining words with concrete examples, rather than confusing abstractions.

⁶⁸ 君君，臣臣，父父，子子 (Li 1999, 143).

country would be correctly governed]” (Li 1999, 143). In Chapter 13 verse 3a of the *Analects of Confucius*, Confucius used a compound term known as *zhèng míng* (正名) which literally translated means “correct name.”⁶⁹

Zhèng míng (正名) is also close in meaning to “pattern[ing] of the people” in its usage, and refers to a political sensibility in Confucius’s statement about correct governance (Y. Wu . personal communication with author July, 2013) [When one’s position is “named” then one knows where to appropriately position oneself in the political pattern.] When in Chapter 13 verse 3a Confucius was asked what he would do if the King of Wei asked Confucius to take over the kingdom, Confucius said “ [I would] surely [use] correct naming [in the kingdom]”⁷⁰ (Li 1999, 150). Confucius continues in Chapter 13 verse 3c to clarify the importance of using correct-naming (*zhèng míng* 正名):

When a name cannot be justified [*míng bù zhèng* 名不正], words have no authority [*shùn* 順]. When words have no authority, missions cannot be accomplished. When missions are unaccomplished, Conduct [*lǐ* 禮] and music [*yué* 樂] cannot flourish.

When Conduct and music are not flourishing, penalties and punishments [*xíng* 刑 and *fá* 罰] cannot be on target [*bù zhōng* 不中]. When penalties and punishments are not on target, the populace are without anchors to guide themselves.

⁶⁹ See Chinese glossary (Appendix B) for an explanation of these two terms *zhèng-míng* (正名).

⁷⁰ *Bì yě zhèng míng hū !* (必也正名乎!) Literally, “Surely also correct name!”

Thus a gentleman's [*jūnzǐ* 君子]⁷¹ name [*míng* 名] must have authority; his words must be put into practice. A gentleman, in relation to his words, must always be vigilant. (Li 1999, 151)⁷²

Here Confucius makes very clear the importance of the linkage with correct-naming (*zhèng míng* 正名) and the weight of authority (*shùn* 順), that is, words people would *obey*. Without correct-naming there is no authority, and proper Conduct (propriety; *lǐ* 禮) and music (*yuè* 樂) do not flourish. Thus governance of people through [the instituting of] proper Conduct (propriety), harmony and resonance⁷³ (implied by the reference to music, *yuè* 樂), and the appropriate application of law (*fá* 罰)⁷⁴ can only occur when there is correct-naming (*zhèng míng* 正名). With correct-naming, people would know what to do to obey and

⁷¹ The term *jūnzǐ* (君子) or “superior man” is used quite often in the *Yì Jīng* (易經) or *Book of Changes* to denote a high state of personal development and conduct.

⁷² The Chinese text for the Confucian *Analects*, Chapter 13, verse 3c is:

名不正，則言不順；言不順，則事不成；事不成，則禮樂不興；禮樂不興，則刑罰不中；刑罰不中，則民無所措手足。故君子名之必可言也，言之必可行也。君子於其言，無所苟而已矣。(Li 1999, 151)

⁷³ I refer to the importance of harmony and resonance in Chinese philosophy in the epilog.

⁷⁴ Some scholars (e.g., Bruce 1922, 290) have attempted to conflate *lǐ* (理, pattern/principle) with *fá* (罰, punish) or *fǎ* (法, law), but others (e.g., Needham 1956) debunk this conflation.

Lǐ [理], then, is rather *the order and pattern in Nature*, not formulated law...it [*lǐ* 理] is a dynamic pattern as embodied in all living things, and in human relationships and in the highest human values. *Such dynamic pattern can only be expressed by the term “organism.”* (emphasis mine; Needham 1956, 558)

follow the directives of what was said by the gentleman (*jūnzǐ* 君子, person of virtue).

Xún Zǐ wrote an entire chapter on correct-naming (*zhèng míng* 正名, see Watson 1967, 139–56). Xún Zǐ states that the term *zhèng míng* (正名) has two functions (Y. Wu 1984, 214–17). Xún Zǐ criticized one of the Hundred Schools, known as the “School of Names” (*Míng Jiā* 名家), for the manipulation of language [naming] to the advantage of its followers and the resulting confusion that occurred from that manipulation. Xún Zǐ called for “the rectification of names” (*zhèng míng* 正名) so that the people would be able to be able to distinguish one thing from another (e.g., Chan 1973, 126). Xún Zǐ’s rectification of names was an attempt to clarify terminology in use of language—through the use of a [conventionally, or socially agreed upon] “correct” term (*zhèng míng* 正名; Chan 1973, 126). With use of correct names one is not confused about the actuality of the term one is referring to. An example of one of “The Three Fallacies” is

“A [white] horse is not a horse.” [This is an example] of the fallacy of so using names as to confuse actualities. Examine them by the convention of names and see how what they have rejected (a horse) contradicts what they have accepted (a white horse) and you will be able to stop the confusion....Only [with] [Xún Zǐ] did [the rectification of names] develop into some sort of logical theory. Where as in other schools the interest is chiefly social or moral, in [Xún Zǐ] it is predominantly logical....This is the nearest approach to logic in ancient Chinese philosophy. (Chan 1973, 127–28)

Xún Zǐ turned the “rectification of names” (*zhèng míng* 正名) into logic. Xún Zǐ’s other use of *zhèng míng* (正名) is to emphasize the connection of the

“rectification of names” with Confucius’s references to political/propriety (*lǐ* 禮) in the *Analects of Confucius* in Chapters 12 verse 11, and Chapter 13 verse 3a, as described above.

In one sense, the logical theory of Xún Zǐ’s use of “rectification of names” (*zhèng míng* 正名) began a kind of “rational organization of society” (de Bary and Bloom 1999, 190) that was carried forward by Xún Zǐ’s students, Lǐ Sī (李斯) and Hán Fēi Zǐ (韓非子).

In its earliest form, “Legalism” was probably the outgrowth of a need for more rational organization of society and resources so as to strengthen a state against its rivals. This was to be accomplished by concentrating power in the hands of a single ruler and by adopting governmental institutions that afforded greater centralized control. (de Bary and Bloom 1999, 190)

Under Hán Fēi Zǐ, legalism took the political/propriety meaning of *zhèng míng* (正名), and turned it into law. Legalism states that unless human beings and social culture are governed by laws, which laws state what moral conduct is and what it is not, both human beings and social culture would degenerate into chaos. This is the opposite of what Mencius thought. Hán Fēi Zǐ thought that the *Dào* (道) and the decrees of a natural ruler were natural law that people should not resist. As a student of Xún Zǐ, Hán Fēi Zǐ also felt that people were naturally evil and should be punished for their evil actions. Legalism, as implemented through laws of the Qín Dynasty (*Qín Cháo* 秦朝 221 BCE–206 BCE), was quite harsh. After the fall of the Qín Dynasty, legalism was rejected by the Han Dynasty (Hàn Chóu 漢朝, 206 BCE–220 CE; see de Bary and Bloom 1999, 227).

Neo-Confucianism

Neo-Confucianism is a term coined in the West to designate a number of closely related and similar schools in the Tang (618–906; de Bary and Bloom 1999, 984) and Song (960–1279; de Bary and Bloom 1999, 982) dynasties: the *Xìng-lǐ Xué* (性理學), or “School of Nature and Principle” (Chan 1973, 14), the *Lǐ Xué* (理學) or “School of Principle/Pattern,” the *Daò Xué* (道學), and the *Xīn Xué* (心學) or “School of Heart-Mind” (de Bary and Bloom 1999, 667). In this book my primary focus is to explore the *Lǐ Xué* (理學), or (as conventionally translated) “School of Principle” of Zhū Xī (朱熹). Zhū Xī was born in Youxi County, Fujian province, during the Sòng dynasty, on October 18, 1130. Historically, the *Lǐ Xué* (理學) actually began with Zhōu Dūnyí (周敦頤), who was born in 1017 in Yingdao County, Daozhou Prefecture in the southern region of Hunan province.

Neo-Confucianism was a return to the ideas of Confucius as a response to the decline of the influence of Buddhism and Taoism at the end of the Tang Dynasty (*Táng Cháo* 唐朝, 618–907) and during the Song (*Sòng Cháo* 宋朝, 960–1279) and Ming (*Míng Cháo* 明朝, 1368–1644) dynasties. The Song dynasty is further divided into two separate timeframes, the Northern Song (*Běi Sòng* 北宋, 960–1127) and Southern Song (*Nán Sòng* 南宋, 1127–1279; e.g., Chan 1973 14). According to Huang (1999, xi), Confucianism was one of a hundred schools of philosophy during the Warring States period, while Neo-Confucianism became the main school.

Neo-Confucianism has been considered by some to be a Chinese renaissance, as it synthesized many existing philosophical schools. According to Huang (1999), Neo-Confucianism arose in response to political and military invasion, the perceived nihilism of Buddhism, and religious Dàoism which taught non-action, rather than the social action of Confucianism. In addition, Neo-Confucianism reflected the rise and reinstatement of the ideas of Confucius, which had come to be considered “empty” and “shallow” during the time period from the Han Dynasty (206 BCE–220 CE) through the Tang Dynasty (618–907; Huang 1999, 4–5).

There are two main ideas in Neo-Confucian metaphysics: the theory of *lǐ* (理), conventionally translated as “principle,” and the theory of *qì* (氣), conventionally translated as “life force.” Though Neo-Confucianism was a revival of and was focused upon the ideas and lineage of Confucius from the emphasis on the Four Books (*Sìshū* 四書), it was broadened in its synthesis of Confucian, Buddhist, and Daoist philosophies. Dr. Y. Wu (2009a, 2009b) reports that in Neo-Confucianism, principle (*lǐ* 理) was used to unify heaven (*tiān* 天) and humanity (*rén* 仁), the internal (*nèi bù* 內部) and external (*wài bù* 外部),⁷⁵ mind (*xīn* 心) and nature (*zì rán* 自然), and virtue (*dè* 德) and knowledge (*zhī* 知).⁷⁶ The terms

⁷⁵ This idea is discussed with the work of Chéng Hào and Chéng Yí, Chapters 2 and 7.

⁷⁶ The Chinese word *zhī* (知) can mean “knowledge” when used with first tone, and can mean “wisdom,” *zhì* (知), when used with fourth tone. This difference is critical when looking at the interpretation of the *Great Learning* (*Dà Xué* 大學).

lǐ (理) and *qì* (氣) have already been discussed in detail in Chapter 5, and are discussed further in conjunction with Zhū Xī, Chéng Yí, and Chéng Haò.

Neo-Confucian Masters

This section presents the Neo-Confucian masters relevant to this book, drawing on the lineages as represented by Y. Wu (2009) in Figure 4 and Huang (1999) in Figure 5.

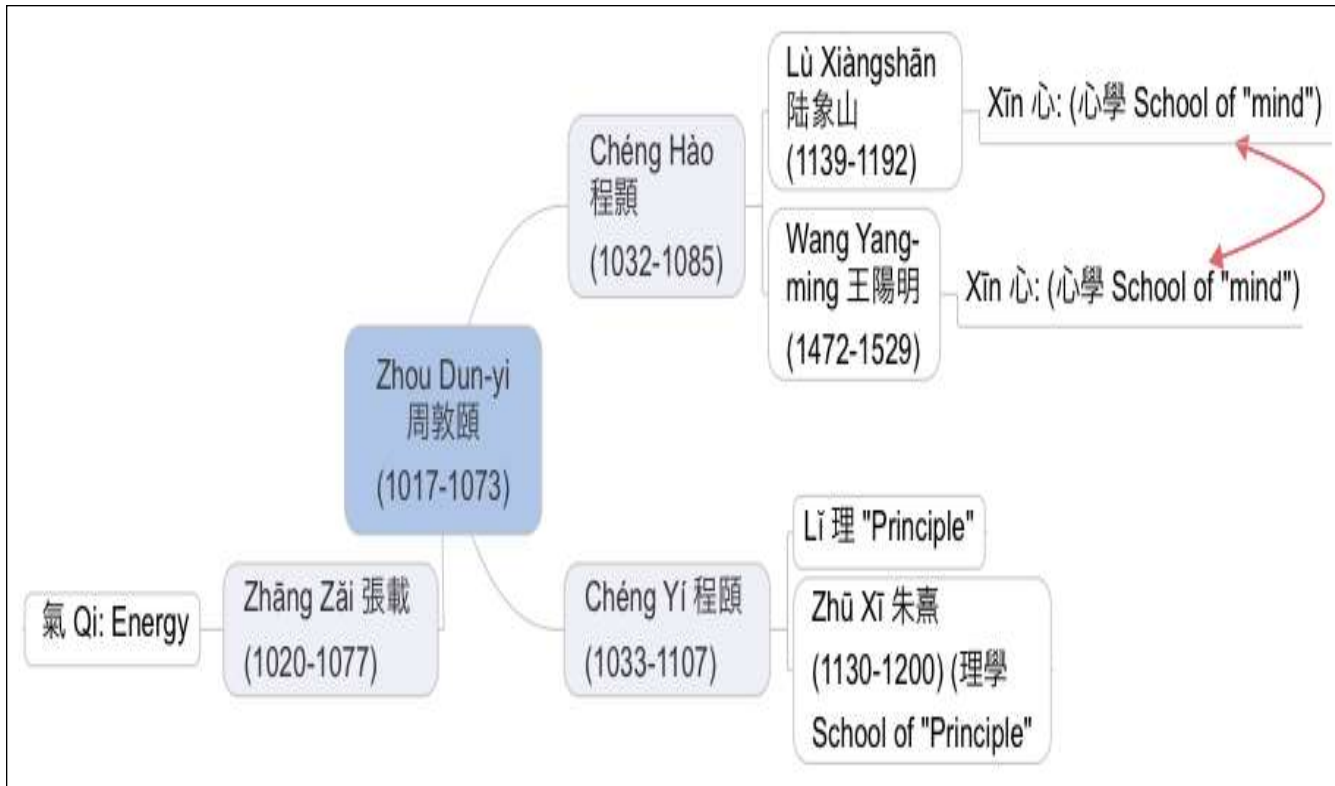


Figure 4. Lineage of Neo-Confucian masters. Data adapted from Y. Wu (2009b). Author's image.

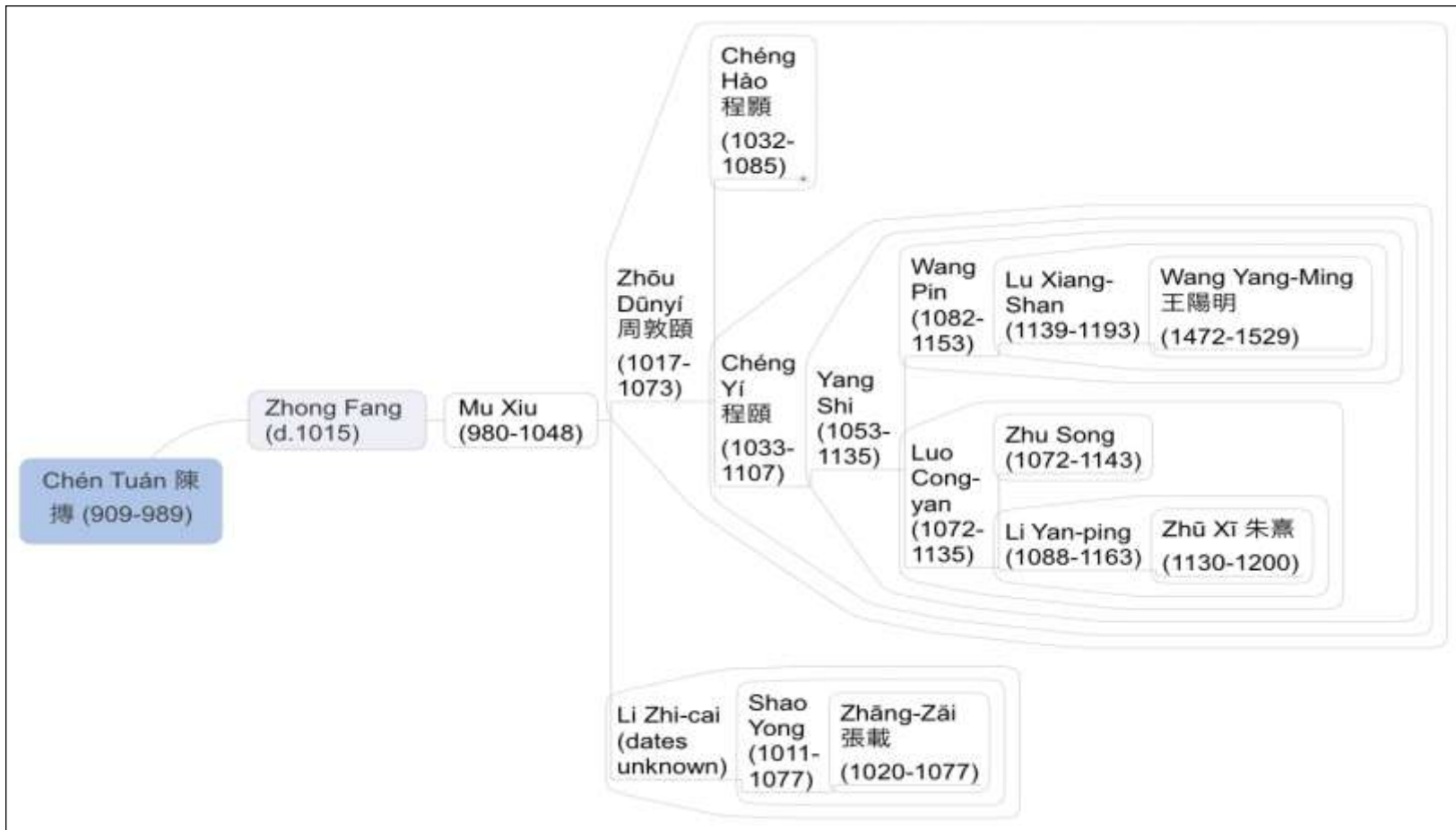


Figure 5. Lineage of Neo-Confucian masters. Data adapted from Huang Siu-chi (1999, 13). Author's image.

Zhōu Dūnyí 周敦頤.

Dr. Y. Wu's (2009b) lineage of the Neo-Confucian masters in Figure 4 starts with Zhōu Dūnyí (周敦頤), in 1017 CE, who developed the diagram of the “Great Ultimate” shown in Figure 6. Zhōu Dūnyí's primary contribution to Neo-Confucianism is this diagram.

At the top of the diagram is the Great Ultimate, *Tàijí* (太極), contrasted with Non-ultimate, *Wújí* (無極). Dr. Y. Wu (2009b) has said that there is no *Tàijí* without *Wújí*, and no *Wújí* without *Tàijí*. *Tàijí* and *Wújí* combine to produce *Yáng* (陽),⁷⁷ action, *yí* (易), and *Yīn* (陰),⁷⁸ quietude, *jìng* (靜). In the next circle of white and black portions of the diagram, *Yáng* and *Yīn* combine, in the next lower part of the diagram with five small circles, each marked with an element, to produce *Wǔ Xíng* (五行) or “Five elements” of Chinese medicine shown in Figure 7.

At the bottom of the *Wǔ Xíng* (五行) “Five Elements” portion of the *Tàijí* diagram is a sixth small circle that is the well known symbol of *Tàijítú* (太極圖), or what is known in the West is the “yin-yang” symbol, shown in Figure 8. This symbol incorporates the movement of the *Tàijí*.

⁷⁷ *Yáng* (陽), means “on the bright side of the mountain.”

⁷⁸ *Yīn* (陰), means “on the shadow side of the mountain.”

In Figure 7 below the *Wǔ Xíng* (五行) “Five Elements” portion of the *Tàijí* diagram is a larger circle that encompasses the masculine principle of *Qián* (乾), the Creative, and the feminine principle of *Kūn* (坤), the Receptive.

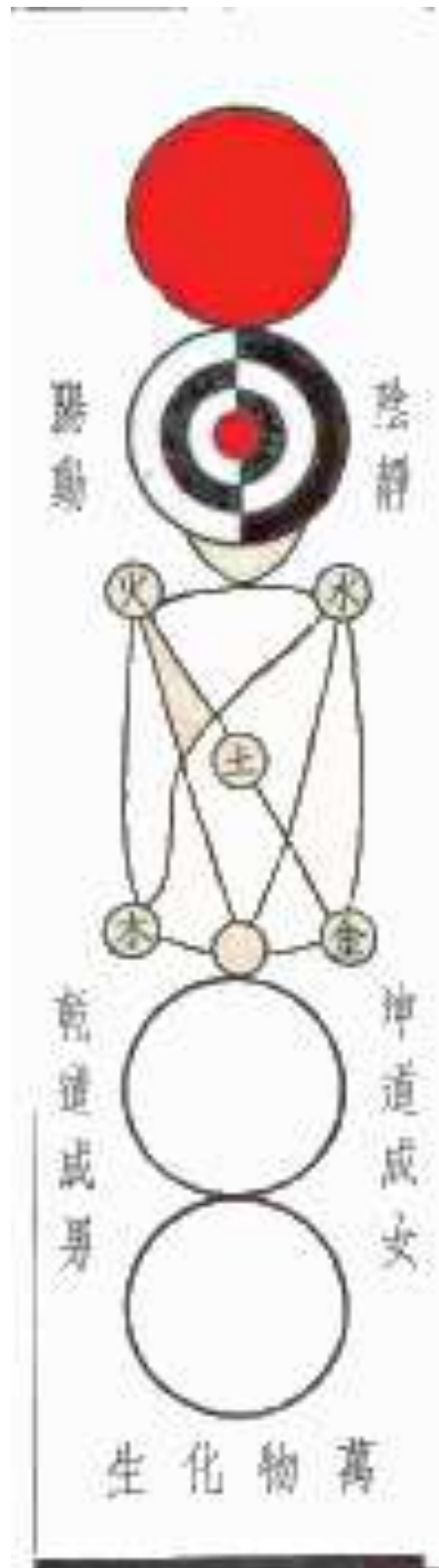


Figure 6. Diagram of the Great Ultimate. “Zhou Shi Tai Ji Tu” (2004). Public Domain image retrieved from Wikimedia Commons.

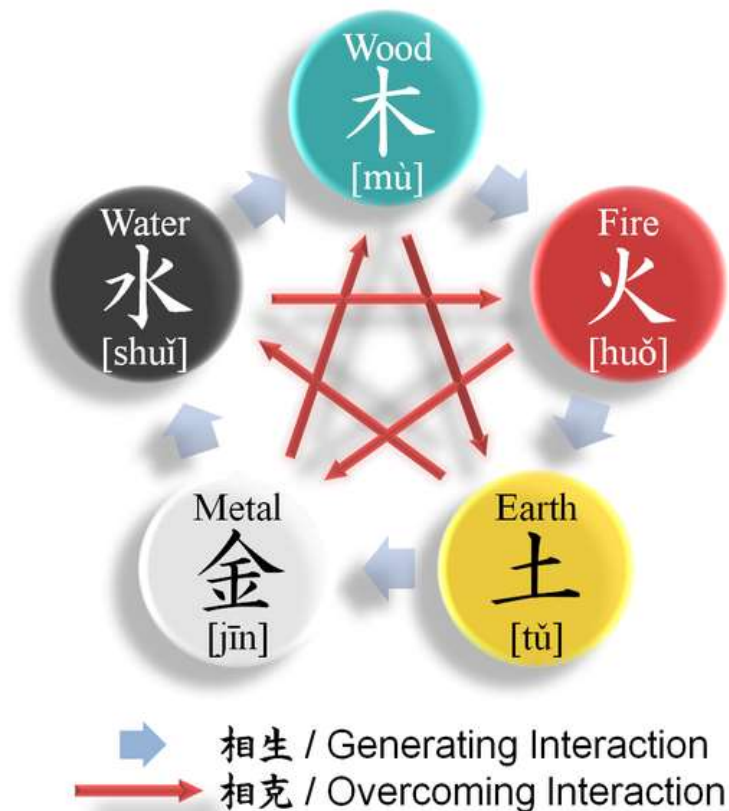


Figure 7. The *Wū Xíng* (五行) or “Five Elements” of Chinese medicine. Graphic by Parnassus (2013). Reprinted under the terms of a Creative Commons Attribution ShareAlike 3.0 Unported license. Public Domain image retrieved from Wikimedia Commons.



Figure 8. *Tàì jí tú* (太極圖; Klem 2007). Public Domain image retrieved from Wikimedia Commons.

These are the first two hexagrams in the *Classic of Changes*, *Yì jīng* (易經). The lowest large circle in the Figure 4 is that from which the 10,000 things⁷⁹ (*Wàn wù*, 万物) arise.

The Two Chéng Brothers

This section explores the contributions of the two Chéng brothers, who were students of Zhōu Dūnyí in 1046–1047 CE (Graham 1958, xv). Chéng Hào (程顥) (1032–1085 CE) and Chéng Yí (程頤; 1033–1107 CE) replaced the Supreme Ultimate *Tàijí* (太極) of Zhōu Dūnyí with what is conventionally translated as “principle”—the word *lǐ* (理), which is the focus of this book. According to Graham (1978), the elder brother Chéng Hào was the first to adopt the word *lǐ* (理). Graham quotes Chéng Hào: “Although some of my doctrines were taken from others, the two words “Heaven’s principle” *tiān lǐ* (天理) are the fruit of my own experience”(3). The younger brother Chéng Yí suggests that

although the same principle [*lǐ* 理] runs through the self and the outside world, within us it is obscured by the ether [*qì* 氣] of which we are composed, so that a better course than introspection is the “Investigation of Things,”⁸⁰ the study of external things, people and affairs, in order to discover the principles [patterns] they follow or should follow. (xviii)

⁷⁹ The 10,000 things is an expression in Chinese meaning “all things.”

⁸⁰ From Confucius’s *Great Learning* (大學), specifically the words *gé wù* (格物), which I choose to translate as “patterning being” rather than the conventional translation of “investigation of things.”

Graham reports that “from the twelfth century onwards, the chief controversial issue within Neo-Confucianism was ‘The Investigation of Things’” [*Gè Wú* 格物] (xix).

The investigation of things (or patterning of being) leads to another idea that Chéng Yí particularly spoke of, namely “to exhaust the principle of things” (Graham 1958, 8) *qióng wù lǐ* (窮物理). I choose to retranslate *qióng lǐ wù* as “to plumb [delve deeply or exhaustively into] the pattern of being,” which I feel is closer to the spirit of the Chéng brothers discussions. This alternate translation serves to facilitate what Chéng Yí said, namely that

All things have principles [patterns]....There is a single principle [pattern] in outside things and in the self; as soon as “that” is understood “this” becomes clear. This is the way to unite external and internal. (Graham 1958, 8)

Both Chéng brothers discuss this idea of uniting internal (self) and external (world/cosmos), through the study of principles (patterns). I develop the ramifications of this idea further in Chapter 6.

Shào Yōng 邵雍

Another Neo-Confucian philosopher becomes relevant at this point, Shào Yōng (邵雍) (1011–1077 CE), whose contributions to Sòng Dynasty philosophy along with contributions to the work of the Chéng brothers is influential. Shào Yōng’s ideas highlight some further understanding of patterns and principles. It was Shào Yōng who suggested integrating tenets of the *Yì Jīng* (易經) into Neo-Confucianism, in his book *Huáng Jí Jīng Shì* (皇極經世), conventionally

translated (by Birdwhistell 1989) as “Supreme Principles that Rule the World.”⁸¹

According to Birdwhistell (1989), this title “broadly suggests that the subject of the work is the patterns of the universe” (14).

One of the most important diagrams from Shào Yōng is from the Commentary on the Supreme Principles that Rule the World (or *Huáng Jí Jīng Shì Shū Jiě* 皇極經世書解). The “Chart of the Eight Trigrams Originally Drawn by Fú Xī (伏羲)” (or *Fú Xī shǐ huà bā guà tú* 伏羲始畫八卦圖) (Birdwhistell 1989, 237), depicted in Figure 9, shows the Great Ultimate, *Tàijí* (太極), at the bottom.



⁸¹ Literally translated as “emperor extreme classic/warp-threads world/life.”

Figure 9. Shào Yōng’s “Chart of the eight trigrams originally drawn by Fú Xī (伏)” (or *Fú Xī shǐ huà bā guà tú* 伏羲始畫八卦圖) (Birdwhistell 1989, 237). From the “Commentary on the Supreme Principles that Rule the World” (or *Huáng Jí Jīng Shì Shū Jiě* 皇極經世書解), reprinted with permission from Birdwhistell (1989, 237) and Stanford University Press. © 1989 by the Board of Trustees of the Leland Stanford Jr. University.

Shào Yōng’s interest was “to reduce the seemingly unrelated richness of [experience] to certain principles [or patterns]...[so that] all phenomena might be understood.” “Shào Yōng discussed...the *Yì Jīng* (易經) [which] by representing situations and alterations in situations, the Hexagrams emphasized the link between human behavior and nature” (Birdwhistell 1989, 42). Birdwhistell (1989) reports that

Chu Hsi described Shào’s thought as concerned with the *comprehension of pattern* [italics added], *míng lǐ* (明理)...As a description of Shào’s thought, *míng lǐ* (明理) could be used in several senses simultaneously. (Birdwhistell 1989, 47–48)⁸²

In recapitulating the goal of Chinese philosophy, Shào Yōng sought to “restore lost unity and harmony” (163). This goal could be realized by becoming a “sage” (163).

“[A Sage] can with one mind perceive ten thousand minds, with one self can perceive ten thousand selves, and with one generation perceive ten thousand generations.” Shào’s point is that a sage can use one thing to know all similar things because he understands the principles or patterns (*lǐ* [理]) of all things....Shào thus emphasized the sage’s ability to identify with Heaven and nature... [thus] the sage becomes confluent with the whole. (Birdwhistell 1989, 169)

Birdwhistell (1989, 171) continues with Shào Yōng’s statement that “I would...know [a sage] by means of the pattern [*lǐ* 理].” Here we have Shào

⁸² The use of a Chinese term in “several senses” also refers to the capability for multiply layered meanings inherent in Chinese characters. See Ames (2008, 37).

Yōng’s ideas about the process of how one knows a sage, continuing the legacy of Confucius in his referencing the Sage-kings of ancient China.⁸³ The Sage-kings of ancient China could thus be known by how they became at one with organic pattern or *lǐ* (理).

Zhū Xī 朱熹 (1130–1200 CE)

In order to properly frame the work of the synthesist Zhū Xī (朱熹; 1130–1200 CE), it is appropriate to further develop the context within which he made his contributions. According to Tillman (1992), the ruling fourteenth-century Mongols of the Yuán Dynasty (*Yuán Cháo* 元朝) made Zhū Xī’s commentaries of the Four Books (or *Si Shu* 四書) (published in 1190 by Zhū Xī; Chan 1986, 2) the basis of Imperial civil service examinations—a practice that lasted through Chinese history until the fall of the Qīng Dynasty (*Dà Qīng Dìguó* 大清帝國) in 1912 (Tillman 1992).

Zhū Xī was one of the main philosophers of a “fellowship”⁸⁴ or tradition of philosophers of the Southern Sòng dynasty known as the School of Dào (*Dào Xué* 道學). This tradition focused upon the development of the ethical and spiritual character of its followers, with an emphasis on scholarship “through personal cultivation” (Tillman 1992, 3). One of the primary points of focus within this school was upon a “speculative” or abstract level of development of ideas,

⁸³ See Appendix C for Birdwhistell’s (1989; 186–87, 194–95) translations of Shào Yōng’s statements on the dissolution of the self.

⁸⁴ This term *fellowship* in this context is used only by Tillman (1992).

known as *xíng ér shàng* (形而上): “the non-empirical; or that which is above or transcends determinate form” (Tillman 1992, 9).

Tillman (1992, 10) continues, “Chu Hsi [Zhū Xī] ...used the term ‘*Tao*’ [道] on more than one level.” On a more concrete level, he first talked about the *Dào* (道) as an “embodiment” of humanity, integrity, decorum, and music. On the abstract level, Zhū Xī then saw the *Dào* (道) as *lǐ* (理; principle, order, and pattern; 10). “The word *Dào* [道] is all embracing; the *lǐ* [理] are so many veins inside the *Dào*[道]” (Tillman 1992, 10; Graham 1958, 12). Stating “*lǐ* [理] are so many veins inside the *Dào* [道]” (Tillman 1992, 10) is a recapitulation of one of the original meanings of the word *lǐ* 理 as “patterns (or veins) in jade.”⁸⁵ Dr. Yi Wu (2009a) has often said “While we cannot know the *daò* [道], we can know the *function* of the *daò* [道].” As discussed in Chapter 5, *lǐ* (理) [organic pattern] is an *iteration*,⁸⁶ *expression*, or *function* of the *daò* (道).

Heaven’s principle [organic pattern; *tiān lǐ* 天理] was core language used by *dào xué* [道學, or School of *Daò* philosophers] to articulate their philosophy....From the time the Ch’eng brothers made this concept central to Confucian philosophy, principle [organic pattern; *lǐ* 理] denoted both the natural inclination in things and the origin or foundation of all things....The *dào* [道] could be known through humanness [*rén* 仁],

⁸⁵ See Chapter 5 for a discussion on *lǐ* (理).

⁸⁶ I use the word “iteration” here, as it is often used in complexity science to describe the product of a process.

righteousness [ethical behavior; *yì* 義], wisdom [*zhì* 知], [and] the “five relationships” [*wǔ lún* 五倫]. (Tillman 1992, 11–12)⁸⁷

Another way to speak of this *lǐ* (理) (organic pattern, or “veins”) of the *dào* (道) is as *tiān lǐ* (天理) or “heaven’s pattern.” As a student of the Ch’eng brothers, Zhū Xī made the multiple levels of the *dào* (道) as expressed through *lǐ* (理) the main component of Zhū Xī’s “School of Principle/Pattern” (*lǐ xué* 理學).

Zhū Xī was a great synthesist (e.g., Chan 1986, 1)⁸⁸ and is acknowledged by many (e.g., Kim 2000; Chan 1986) as the philosopher who “completed” Neo-Confucianism. According to Chan (1987, 122), this completion was accomplished by connecting the ancient masters from the legendary Fu Xi to Zhou Dun-yi (for his work with the Great Ultimate (*Tàijí* 太極) and the Chéng brothers (specifically to Chéng Yí, for his work on the convention of *lǐ* 理).

Zhū Xī made the entire basis of his philosophy this axiom of *lǐ* (理) (translated as pattern or principle), from his understanding of the ideas expressed in Confucius’s *Great Learning*. Zhū Xī’ focused particularly the terms *gè wú* (格物) or “the investigation of things”(Kim 2000, 2), which I have chosen to interpret as the “patterning of being.” *Gè wú* (格物) was the basis for his entire

⁸⁷ The five Confucian relationships are between ruler and subject, husband and wife, parent and child, elder and younger siblings, and friend to friend (e.g., Chan 1973, 70, 105, 277).

⁸⁸ Zhū Xī was thought of as “*Jí dà chéng*” (集大成) (gather great establish) or “synthesist” referring to Mencius’s description of Confucius: “the one who gathered together all that was good. To do this was to open with bells and conclude with jade tubes” (Lau 2003, 218; *Mencius* 5B: 1).

endeavor to become a sage (Gardner 1990, 117). Zhū Xī wished to teach others how to emulate the great Sage-Kings of antiquity, to develop wisdom through personal cultivation.

Fung Yu-lan states that “Zhū Xī himself was one of the great ontologists in the history of Chinese philosophy” and that “the Neo-Confucianists...tried to achieve a unity of (particularity and universality)... through the accumulation of moral conduct” (quoted in Chan 1986, 23). Zhū Xī’s primary focus upon *lǐ* (理) (principle or pattern) became known as “the School of *Lǐ* (理)” (or *lǐ xué* 理學).

According to Fung (quoted in Chan 1986), to the Neo-Confucians, the development moral conduct involved the reduction of selfishness—when selfishness has been sufficiently reduced, it is “completely overcome, and a unity of particularity and universality comes as a result” (23). This point is what Zhū Xī called the “‘thorough understanding’ (*huò rán guàn tōng* 豁然貫通)... and what Ch’an Buddhism called ‘sudden enlightenment’” (Chan 1986, 24). This development of moral conduct comes from cultivating oneself; it comes from connecting the internal and external and from the sudden understanding that comes with that connection, as stated by Cheng Yi (de Bary 1985, 339) and Zhū Xī (Kim 2000, 22).

According to Zhū Xī, though there is a *lǐ* (理) of individual things, that there is also a “heavenly *lǐ*” (*tiān lǐ* 天理). Zhū Xī felt the purpose of “the investigation of things” (*gè wú* 格物) is to move from the individual *lǐ* (理) to “heavenly” *lǐ* (*tiān lǐ* 天理; Kim 2000, 24–25) where universality is found in particularity (*lǐ yī fēn shū* 理一分): *lǐ* (理) is one but manifestations are many

[Chan 1986, 2]). The idea of seeing the cosmos as one's own body (Birdwhistell 1989, 194–95) is further developed in Chapter 6. As a context and basis for *lǐ* (理) (principle/pattern) and its compliment in the world *qì* 氣 (energy), Zhū Xī further developed “heavenly” *lǐ* (理) or *tiān lǐ* (天理), of Zhōu Dūnyí's idea of the “Great Ultimate” or *tàijí* (太極) where the “*tàijí* is the sum total of all *lǐ* [理]” (Chan 1986, 3).⁸⁹ One own body *becomes* the *tàijí* (太極) or “Great Ultimate.”

The word *rén* (仁) describes a quality that an individual can develop through self-cultivation, known as “humanity,” or an empathy for fellow human beings. Though Confucius first set forth the idea of “humanity” (*rén* 仁) as “the general virtue [of an individual] out of which all virtues emerge, Chan (1986, 3) posits that

Chu Hsi went still further to describe *rén* [仁] as “the heart/mind [*xīn* 心] of heaven and earth [*tiān dì* 天地] to create things.” In so doing [Zhū Xī] combined philosophy, religion, and ethics into one.

This recapitulates the theme of the individual as cosmos and the cosmos as individual. The empathic human could *feel* the needs of humanity.

In feeling the needs of humanity, not only did Zhū Xī establish public granaries for famine relief, he was an intense advocate of education. As mentioned above, Zhū Xī's commentaries on the four books were adopted as the basis for imperial civil service examinations in the thirteenth century. He reconstructed the White Deer Hollow Academy (*bái lù dòng shū yuàn* 白鹿洞書

⁸⁹ See Chapter 3 for a discussion of *lǐ* (理) (organic pattern) and *qì* (氣) (manifest energy).

院) and the Yüeh Lu Academy (*yuè lù shū yuàn* 嶽麓書院; Chaffee 1985, 40–62) and pioneered evidentiary research (*kǎo jù* 考據) that brought critical assessment to the study of the Five Classics (Chan 1986, 4).

Lù Jiǔ Yuān 陸九淵 (1139–1182)

This cursory glance at Zhū Xī would not be complete without a short discussion of Lù Jiǔ Yuān, also known as Lù Xiàng Shān (陸象山), who was a primary rival of Zhū Xī in the *Dào Xue* (道學) of the Song dynasty. Lù is considered a founder of the *Xīn Xue* (心學) or “School of Heart/Mind.” The *Xīn Xue* is also known as the “idealist” school⁹⁰ that emphasized “intuition as a path to knowledge” repudiating Zhū Xī’s focus on *gè wú* (格物) (or the “investigation of things). (Schirokauer 1960, 62). In contrast, Zhū Xī is considered to have founded the “realist” school, which emphasized his “rational” and evidentiary approach of contemplation, study, and inquiry.⁹¹ Schriokauer (1960, 62) states that Lù was a follower of Mencius, was influenced by the spontaneity and simplicity of Daoism, and felt that Buddhism was selfish⁹² and corrupt (because of being escapist, where Confucianism was righteous).

⁹⁰ Which later included the Ming Dynasty prominent scholar Wáng Yángmíng (王陽明, 1472–1529).

⁹¹ In my opinion, these labels of “idealist” and “realist” are imposed from a Western philosophical perspective that is in its way attempting to make Chinese philosophy “fit” into Western categories—which they do not.

⁹² A charge of “selfishness” in Buddhism does not take into account the doctrines of the Madhyamaka school of Nāgārjuna (150–250 CE) or the Mahayana school (Komito 1987 32–35, 49).

Lù named Mencius as the source of his idea of *dào* (道) as *xīn* (心) (heart/mind), and heart/mind (*xīn* 心) as principle (lǐ 理). Dr. Y. Wu (2009a) has said repeatedly that we cannot know the *dào* (道), but we can know the *function* of the *dào* (道), and that the *dào* (道) *makes space* for things. Though Mencius was correct that the *dào* (道) is *xīn* (the *dào* 道 is the heart/mind), for both Lù (and later Wáng Yángmíng, 王陽明) to broaden the *dào* (道) to the *xīn xué* (心學) or “School of Heart/Mind” is an anthropomorphization of the *dào* (道). The *xīn* (心) (heart/mind) could properly be said to be a *function* of the *dào* (道), as is everything else found in the space that the *dào* (道) makes for those things.

The *xīn* (心) as a *function* of the *dào* (道) is more consonant with the *Dào Xué* (道學) of which all Neo-Confucians were participants. The Neo-Confucians were perhaps more philosophically *Dàoist* than the religious *Dàoists* of the time. The *Dàoists* in the twelfth century were more concerned with the *Dàoist* idea of *wú wéi* (無為) (non-action) as *in-action*, leading to a withdrawal from the world into a realm of empty religious ritual (Chan 1973 142).⁹³ This focus on *in-action* is in contrast to a more appropriate *Dàoist* understanding of *wú wéi* (無為) as a spontaneous and active involvement in the world without effort, mentation, or forethought.

⁹³ In a way, this twelfth-century Taoist approach to *wú wéi* was very much like the nihilism that had crept into Buddhism in China at the same time (Chan 1973 359, 396).

De Bary and Bloom (1999) report that Zhū Xī had differentiated between the

original moral nature of human beings and their actual nature as embodied in material-force (*qì* 氣) as a way to understand ignorance and evil among human beings, who by nature are supposed to be good. (714–15)

Lù thought these differences defined by Zhū Xī were superfluous, and veiled the underlying unity that is basic to the cosmos. Lù felt that human beings could come to know this underlying unity *without* studying principles [organic patterns], as Lù felt that the diverse aspects of human experience were basically all the same thing. Further, according to de Bary and Bloom (1999), Lú’s criticisms of Zhū Xī reject any practical application for “quiet-sitting” as well as the idea that study can bring one to understand one’s moral nature. Lù asserted that Zhū Xī “ignores honoring one’s moral nature” and that “without this honoring [of one’s moral nature as a *prior* condition for study], one cannot [then] follow the path of study and inquiry.” “This moral nature,” said Lù, “in the human mind is endowed by Heaven (*tiān* 天) and cannot be wiped out” (as quoted in de Bary and Bloom 1999, 714-15).

As a key point of Lù’s argument, cited in deBary and Bloom (1999, 719), Lù quotes *Mencius*, Book 6A, verse 10: *cǐ zhī wèi shī qí běn xīn*, (此之謂失其本心), which is conventionally translated as: “This way of thinking is known as losing one’s original mind” (Lau 2003, 254–55). With a broader interpretation of the word *shī* (失), Lù’s criticism of Zhū Xī falls apart. The word *shī* (失) cannot only mean “lose” but also to “mistake” and to “neglect.” So, this phrase of Mencius’s could also be translated and understood as: “This way of thinking is

known as *neglecting* or *mistaking* one’s original heart/mind.” The same is true for *Mencius* Book 4B, verse 12: *Mèng zǐ yuē: Dà rén zhě bù shī qí chī zǐ zhī xīn zhě yě.* (孟子曰：大人者不失其赤子之心者也。), conventionally translated as “Mencius said: The great man is he who does not lose his child’s heart.” (Legge 1895, 322) Here again, *shī* (失) can be retranslated as “neglect [his child’s heart]” rather than “lose [his child’s heart].”

Zhū Xī’s point in differentiating between the inherent moral nature of human beings and the expression of this nature, is that the heart/mind is not “lost” as much as it may be “neglected.” This neglect may be remedied by both methods: by that of Zhū Xī, in studying and reflecting on one’s studies (“quiet-sitting” or *jìng zuò* 靜坐), and so coming to realize one’s inherent [moral] nature (de Bary 1985, 338–39); and by Lù Jiǔ Yuān’s suggestion to intuit the inherent moral nature of human beings without need for distinctions (de Bary and Bloom 1999, 715). However, Zhū Xī’s method brings a greater awareness of principles [or patterns within patterns] of one’s inherent moral nature, which *then* can bolster an intuitive approach to morality, without anthropomorphizing the *dào* (道).

It is natural that human beings will intuitively anthropomorphize anything human beings study. My point is that the *dào* (道) and its function of *lǐ* (理) (principle/pattern) *precedes* any linkage to *xīn* (心) (heart/mind)—that *lǐ* (理) (principle/pattern) *precedes* both *xīn* (心) (heart/mind) and *qì* (氣) (material-force;

e.g., Sun 1966, 171–73).⁹⁴ This suggests precedence of Zhū Xī's *Lǐ Xué* (理學) (School of Principle) of which Lù Jiǔ Yuān and Wáng Yángmíng's *Xīn Xué* (心學) (School of Heart/Mind) is an anthropomorphized development. (Along with Lù Jiǔ Yuān and as a further developer of the work of Lù Jiǔ Yuān, Wáng Yángmíng [王陽明 1472–1529] of the Míng [明] dynasty also missed Zhū Xī's point, but a discussion of Wáng Yángmíng and Wáng's development of *Xīn Xué* (心學) [The School of Heart/mind] is beyond the scope of this book).

⁹⁴ See Chapter 3 for a discussion of *lǐ* (理) and *qì* (氣).

Chapter 3: Exploration of Lǐ 理 as Organic Pattern.

In this chapter, I explore a patterned topography⁹⁵ regarding the Chinese character *lǐ* (理), as this character and its interpretation have carried a great deal of relevance in the development of Chinese philosophy and Western concepts of Chinese philosophy. Rather than an in-depth, granular etymological study of *lǐ* (理) as has so effectively been done by Moran (1984, 83–185), I explore the arguments for the legitimate yet unconventional⁹⁶ translation of *lǐ* (理) as “organic pattern,” as suggested by Moran (1984, 83–185), Needham (1956, 558), and Sun (1966).⁹⁷ Chinese characters show the potential of multiple and embedded meanings, which allow for different deepened meanings of characters in a hermeneutic sense, in the same textual body, as one’s awareness of nuances of

⁹⁵ I use topography not so much to indicate a “graphic and visual aspect” of things as much as to indicate the “shape” of things, like the shape of land as indicated by Patrick Moran and his original meanings of the word *lǐ* 理 (Moran 1984, 85–91). I think a transcendent organic patterned topography is a place. I also reference the following *Oxford English Dictionary* (2013h, paragraph 1-2) definitions of “topography”:

1.a. The science or practice of describing a particular place... the accurate and detailed delineation and description of any locality. 1.b. A detailed description or delineation of the features of a locality. 2. The features of a region or locality collectively, i.e. 1642 Milton *Apoll. Smectymnuus* in *Wks.* (1851) III. 262 Having rambld over the huge topography of his own vain thoughts. 1764 T. Reid *Inq. Human Mind* vi. § ii. 155, I confess I am not so well acquainted with the topography of the mind.

⁹⁶ I am referencing left-hemisphere, Western oriented translations and uses of the term *lǐ* (理); see also introduction to Chapter 6 on translation theory.

⁹⁷ In this chapter I explore the Chinese character *lǐ* (理); its use by Zhū Xī and other Neo-Confucianists is explored in depth in Chapter 2.

meaning and context of a text grows. This phenomena is known as “paranomasia” (Ames 2008, 37-48).

With the unconventional and deepened translation of Neo-Confucian use of *lǐ* (理) as “organic pattern” as shown to have legitimacy, and the argument made for *lǐ* (理) as “organic pattern” by Sinologist Joseph Needham (Needham 1956, 558), *lǐ* (理) is then shown to take on a transcendent quality, so that the meaning becomes “organic patterns” of the cosmos, in line with the organismic quality of Chinese philosophy (Mote 1971, 19). A question then arises as to which comes first from the *daò* (道)—the “organic pattern” of *lǐ* (理) or the “spirit-energy” of *qì* (氣) (as *qì* 氣 infuses its homonym *qì* 器 as “instruments,” or “physicality” with spirit-energy).

Selected compound Chinese terms that use *lǐ* (理) show how *lǐ* (理) brings additional dimension to the compound terms. The chapter closes with a short discussion on how I find Zhū Xī’s *lǐ xué* (理學) or “School of Pattern” to have greater relevance to a harmony with the organic patterns of the cosmos than the later work of Wang Yangming’s *xīn xué* (心學) or “School of Heart-mind,” for Wang Yangming’s anthropocentric viewpoint. *Lǐ* (理) is shown to evolve from an organic patterned topography to a transcendent organic patterned topography. With the transcendent quality of *lǐ* (理), as a *function* of the *daò* (道), the natural world *emerges* from *lǐ* (理) as “spirit-energy” or *qì* (氣) into “instrumentation” (which is the physicality of the world) or *qì* (器). *Lǐ* (理) retains its transcendent

quality even with the anthropomorphization of Wang Yangming and the “School of Heart-mind” or *Xīn xué* (心學).

In addition to *lǐ* (理), there is one other relevant term to touch upon in this chapter that has to do with “organic pattern” which is the Chinese term *gé* (格),⁹⁸ which is used in the *Great Learning* (*Dà Xué* 大學). I suggest that *gé* (格) is a precursor of *lǐ* 理.⁹⁹ In the *Great Learning* (*Dà Xué* 大學), the pivotal sentence, *Zhì zhī zài gè wù* (致知在格物), is conventionally translated as, “Extend knowledge and investigate things” (Gardner 2007, 136), where *gé* (格) is translated as “investigate.” I found that the character *gé* (格) could also be translated as “pattern” (Harbaugh 1998, 22). Thus, the pivotal sentence from the *Great Learning* could be legitimately translated as “the completion of wisdom and *pattern* things.” In the Chinese glossary (Appendix B), I suggest the character *gé* (格) can be translated as “the pattern of wood that speaks.” This translation is consistent with the idea of “organic pattern,” as it refers to the pattern of growth in wood that informs observers of such patterns.

I speculate that Zhū Xī, in his compiling of and commentary on the Four Books and particularly the *Great Learning*, referenced the term *gé* (格) for the development of the term *lǐ* (理), as both terms can be translated as “pattern.” It is

⁹⁸ See Appendix B for *gé* (格).

⁹⁹ though, as Moran (1984) reports, *lǐ* 理 is used in the *Classic of Odes* which may be concurrent with the *Classic of Rites*, from which the *Great Learning* is drawn.

clear to Sinologist Joseph Needham (1956, 558) that Zhū Xī meant “organic pattern” when using the term *lǐ* (理).

Paronomasia

How are these similarities and differences in interpretation of *lǐ* (理) and *gé* (格) explained? One key factor is a particular quality of embedded meanings in Chinese characters that Ames (2008) refers to as *paronomasia*.

The technical term for defining, and in fact redefining, expressions by using words that sound alike or that have a similar meaning is “paronomasia.” Significantly, in this paronomastic process, the expectation is that we are not just “discovering” definitions about an existing world, but actively delineating a world and bringing it into being. Paronomastic definition is found everywhere in classical Chinese literature. When we consult traditional dictionaries that themselves chronicle the cultural associations of this world—the second-century *Shuowenjiezi*, for example—we discover that terms are not as much defined analytically and etymologically by appeal to essential, literal, putatively “root” meanings, as they are generally explained metaphorically or paronomastically by semantic and phonetic associations. (38)

Paranomastic definition suggests that Chinese characters may have multiple embedded meanings, according not only to textual and philosophical context, association, semantics, and phonetics, but also to the meanings available only through deepening understandings from involvement with a text in a hermeneutic sense. Where on the surface the character *lǐ* (理) may properly wear the meanings of “principle” and “law,” according to Western philosophical sensibilities and left-hemisphere logical precision, I argue that the sense of the word as “organic pattern” is closer to an original context and meaning that is in resonance and harmony with the Chinese philosophical notion of the cosmos as organic pattern (Moran 1984, 83).

Lǐ 理 as “Organic Pattern”

Lǐ (理) has mostly been translated in a conventional Western philosophical mode as “principle” or “law” (e.g., Chan 1973, 1986; Fung 1973; Bruce 1923; Leibniz, Cook, and Rosemont 1994; Leibniz, Schrecker, and Schrecker 1965). While these translations have their place, Needham (1956), Sun (1966), and Moran (1984) make a convincing case for the translation of *lǐ* (理) as “organic pattern.” This retranslation serves the purposes of the present book, as it supports the drawing of parallels between Chinese philosophy and complexity science in much greater depth than does *lǐ* (理) rendered as “principle or “law.”

English Sinologist Joseph Needham (1956) has written clearly about the significance of *lǐ* (理) in Chinese philosophy. Needham explicitly speaks of the patterns that are shown by *lǐ* (理), in organic structures and how Zhū Xī used the term to refer to patterns in nature, rather than any sort of law.

The word *lǐ* (理), in its most ancient meaning, signified the pattern in things, the markings in jade or the fibres in muscle; as a verb it meant to cut things according to their natural grain or divisions. Thence it acquired the common dictionary meaning, “principle.” It undoubtedly always conserved the undertone of “pattern,” and Chu Hsi himself confirms this, saying:

“*Lǐ* (理) is like a piece of thread with its strands, or like this bamboo basket. Pointing to its rows of bamboo strips, the philosopher said, ‘One strip goes this way’; and pointing to another strip; ‘Another strip goes that way.’ It is also like the grain in the bamboo—on the straight it is of one kind, and on the transverse it is another kind. So also the mind possesses numerous [patterns] principles (*lǐ* 理).”¹⁰⁰

Lǐ (理), then, is rather the order and pattern in Nature, not formulated law. But it is not pattern thought of as something dead, like a

¹⁰⁰ Psychologist Terry Marks-Tarlow (2008) goes into the organic patterns of the psyche with the use of complexity science. See Chapter 4 and 6.

mosaic; it is dynamic pattern as embodied in all living things, and in human relationships and in the highest human values. Such dynamic pattern can only be expressed by the term “organism,” and...Neo-Confucian philosophy was in fact a scheme of thought striving to be a philosophy of organism. (Needham and Wang 1956, 558)

Needham suggests that rather than being static “formulated law” (Needham and Wang 1956, 558), the Neo-Confucian understanding of *lǐ* (理) was dynamic, vital, and transcendent. *Lǐ* (理) not only includes the organic patterns of individuals, plants, animals, and minerals; *lǐ* (理) refers to the transcendent living organic pattern of nature that is in accord with the Chinese idea of an organismic cosmos.

In his 1984 book *Exploration of Chinese Metaphysical Concepts: The History of Some Key Terms from the Beginnings to Chu Hsi (1130–1200)*, Patrick Moran begins his exhaustive chapter on the Chinese term *lǐ* (理) by discussing the appropriate and grounded translation of the term *lǐ* (理) as well as the transformation of *lǐ* (理) “from the simple idea of pattern” to “theoretical considerations derived from the *Yi jīng* (易經) and its appendices...used to account for the production of *patterned being in the universe*” (emphasis mine; Moran 1984, 83). And last, the “major turning point [in the development of *lǐ* 理] was the elevation of *lǐ* (理) to transcendent status” by means of how

Buddhist thinkers gave the word a patently transcendent signification. After this critical change to a transcendent *lǐ* 理, a clear connection could be made between the *Tài-jí* 太極,¹⁰¹ [which means] all being, and all value. *Tài-jí* 太極 was seen as the transcendent *lǐ* 理 that produces all immanent *lǐ* 理, that is, the transcendent potential for all immanent patterned being in the universe....The transcendent *lǐ* 理, or *Tài-jí* 太極,

¹⁰¹ *Tài-jí* 太極 as a Neo-Confucian idea is explored in Chapter 2.

came thus to be seen as the perfect potential of ethical values as well as other regularities. (Moran, 1984, 84)

Lǐ (理) can be seen here to develop and connect to a meaning beyond simple terrestrial topography, into a metaphysical idea that embraces the organic patterns of the cosmos.

Moran (1984) goes into detail on the initial development of *lǐ* (理). *Lǐ* (理) began as a word that referenced the shape and elevations of cultivated earthen fields and the surrounding village. While *lǐ* (理) initially refers to the idea of topography, the meaning of *lǐ* (理) was broadened and applied to the structures (of topographies or *patterns* of veins) of stones, particularly jade.

The *Shuōwén Jiězì* 說文解字, a Han-dynasty etymological dictionary written about 100 A.D., treats “*lǐ* 理” as a verb and says that it means “to work jade.” However the structure of the character for the word “*lǐ* 理” seems to indicate such ideas as topography and pattern.¹⁰² The left-hand element of “*lǐ* 理” is “*yù* 玉” or jade. Since jade may have veins,¹⁰³ or a variation of colors within the stone, this fact suggests the idea of pattern.¹⁰⁴ The right hand element of “*lǐ* 理” is “*lǐ* 里” which gives the pronunciation of the word. The earliest known usages of “*lǐ* 里” have nothing to do with jade. There no extant oracle or bronze forms, so it is impossible to say whether the jade element was present in the earliest written forms of the word. “*Lǐ* 里” (field 田 plus earth 土) also has a meaning that is relevant to the meaning of “*lǐ* 理,” and, in fact, is more closely related to the meaning found in the earliest extant instances of “*lǐ* 理.” “*Lǐ* 里” means a village and its environs, including the fields cultivated by the dwellers of the village. (86)

¹⁰² See the character *lǐ* (理) in the Chinese glossary.

¹⁰³ I made a connection with the veins or patterns in jade as a kind of “frozen turbulence,” which led me to speculate on the fractal nature of the patterns in jade. See Chapter 1 for personal connection to the topic.

¹⁰⁴ Jade and marble show fractal patterns, or what I found to be “frozen turbulence.”

Moran continues to offer examples of *lǐ* (理) from the Confucian *Classic of Odes*, the *Shī Jīng* (詩經): In odes 210, 237, 250, and 262, *lǐ* (理) consistently means “to lay out the fields” (89). The importance of topography and terrain is understandable for the agrarian culture of ancient China. Moran then lists forty meanings of *lǐ* (理), “All of them can be traced back to the original meaning of “pattern” (131).

The term *lǐ* (理) evolved through time, yet *lǐ* (理) did so in an inclusive way that incorporated earlier definitions. In the beginning of the use of the term, *lǐ* (理) held the idea of patterns in cultivated lands (i.e., the pattern of the lay of the land and of the village. The meaning of *lǐ* (理) evolved to include the patterns in stones (particularly prized minerals such as jade, which had their own sort of topography¹⁰⁵ and pattern), to the organic patterns in wood and fibers of muscle—all of which had a similarity in organic pattern. *Lǐ* (理) continued to evolve to include transcendent awareness that was consistent with the organismic idea of the cosmos, that everything in the cosmos was organic pattern (Mote 1971, 19).

Transcendence of *Lǐ* 理

Here I look at *lǐ* (理) as a transcendent idea that was consistent with the organismic idea of the cosmos. With a transcendent *lǐ* (理) comes the idea that the transcendent organic pattern was the *source* of observed organic patterning of

¹⁰⁵ See Chapter 3, footnote 96, regarding *OED* definitions and use of the term “topography.”

things in daily life (in the following discussion, “things” are called “instruments”).

The [*dào* 道], or what is above shapes, considered in itself independently from concrete things, is called [*lǐ* 理]; but considered in relation to concrete things, is called [*xìng* 性] (nature). In fact, nature is [*lǐ* 理], but it is that [*lǐ* 理] which has fallen into [*qì* 器] and mingled with it. (Sun 1966, 158)

[*Lǐ* 理] is above shapes....[*Lǐ* 理] transcends time....The [*Lǐ* 理] existed even before the formation of the universe....the [*lǐ* 理] do not depend on the existence or non-existence of heaven and earth. Thus Chu Hsi says: “Even if mountains, rivers, and the earth would have vanished, nevertheless the [*lǐ* 理] are still here....The [*lǐ* 理] belong to the category of eternity....The [*lǐ* 理] also transcend space....The world of [*lǐ* 理] is the world of patterns.” (Sun 1966, 163)

To sum up what Sun (and Zhū Xī) are saying, these cosmic organic patterns of *lǐ* (理) transcend time and space, are eternal, and are beyond heaven and earth. The world *emerges* from these organic patterns. The emergence (or iteration) of the cosmos in forms of organic pattern is one of the found parallels with complexity science as described in Chapter 4.

***Lǐ* 理 and *Qì* 氣**

Which comes first out of the *daò* (道)? Is it the organic pattern *lǐ* (理), or the spirit-energy/material force of *qì* (氣) that infuses the “instrument” *qì* (器) by which things come into being? Zhū Xī clearly explains the differences between *lǐ* (理) and *qì* (氣), and the priority of each, and that while *lǐ* (理) (organic pattern) and *qì* (氣) (energy/material force) are really parts of the same thing, it is *lǐ* (理) that *precedes* *qì* (氣), in the process of *qì* (氣) emerging from the *daò* (道).

There are [*Lǐ* 理](principle)[organic pattern] and [*Qì* 氣](material force). [*Lǐ* 理] is the [*Dào* 道] which is above shapes, and is the source from

which all things are produced; [*Qì* 氣] (material force) is the [*Qì* 器] (instrument) which is within shapes, and is the means whereby things are produced. The [*Dào* 道] is the principle [organic pattern]¹⁰⁶ and the [*Qì* 器] (instrument)¹⁰⁷ is the concrete object of the world. Chu Hsi substituted [*Lǐ* 理] for [*Dào* 道], and [*Qì* 氣] (material force) for [*Qì* 器] (instrument). He thought he had arrived at the proper interpretation of the ancient texts. (Sun 1966, 157–58)

[*Lǐ* 理] has never been separated from [*qì* 氣.] However, [*lǐ* 理] is above the realm of corporeality where as [*qì* 氣] is within the realm of corporeality. Hence when spoken of as being above or within the realm of corporeality, is there not a difference of priority and posteriority? [*Lǐ* 理] has no corporeal form, but [*qì* 氣] is coarse and contains impurities.... [*Lǐ* 理], considered *in relation to the concrete world*, that is, *relatively*, has no *temporal* priority over [*qì* 氣], but it does have a priority in *nature* [*xìng* 性] and in *dignity*... Chu says... “There is [*lǐ* 理] before there can be [*qì* 氣].... There is [*lǐ* 理] first, and afterward [*qì* 氣] is born.” ... From these statements, it is clear that [*lǐ* 理] is prior to [*qì* 氣] in both nature and origin. But we must bear in mind that here we are speaking of [*lǐ* 理] absolutely. This absolute [*lǐ* 理] is, in fact, identified with [*Tàijí* 太極] (the Supreme Ultimate).¹⁰⁸ (Sun 1966, 173)

There has been discussion of *xìng* (性) “nature,” which can be the constitution or make-up of individual things. Therefore, as Zhū Xī has said, each thing has its “nature.” However, in Chinese philosophy the cosmos is considered to be “organismic” (Mote 1971, 19) and “holistic” (de Bary 1985, 331–58)—that is, there are actually no “separate” things as we would think of them in Western philosophy. In this way of thinking there are no separate things in the cosmos, so

¹⁰⁶ I have suggested above that the term “organic pattern” is a better translation in reference to *lǐ* (理) than is “principle.”

¹⁰⁷ Like a musical instrument, see Appendix B for *qì* (器).

¹⁰⁸ See Appendix B for *Tàijí* (太極).

xìng (性) can also be used to indicate the *aggregate* nature of all things. Thus it can be said that “[lǐ 理] is one and its manifestations are many” (Sun 1966, 185).

Lǐ 理 in compound words

In *Chinese Philosophical Terms*, Dr. Yi Wu (1986, 102–5) discusses a number of important iterations and developments of the term lǐ (理) as compound words. A relevant and pragmatic alternative of “organic pattern” may be inserted in all his English translations and implications of the compound words using the term lǐ (理).

Yī Lǐ 一理: “Righteousness”

Dr. Yi Wu’s (1986) first definition of lǐ (理) suggests that in the *Mencius* (孟子),¹⁰⁹ in five of the seven instances of lǐ 理, it meant

“orderly” or “reasonable”; the other two have philosophical meanings. In both cases, lǐ 理 is associated with righteousness....After Mencius, lǐ 理 was accepted as following righteousness; they were combined into yī-lǐ 一理. (102)

This is understandable when yī-lǐ (一理) is translated as “first pattern”: the primary pattern that one would follow before any other, to align one’s-self with the cosmos in a harmonious way.

Lǐ 禮: “Propriety,” “Rites,” “Ritual.”

Dr. Yi Wu (1986, 103) points out that this character is a homonym of lǐ (理) that is written differently. In my own etymological exploration of lǐ (禮), I

¹⁰⁹ The *Mencius* 孟子 is one of the *Four Books* (四書) highlighted by Zhū Xī in 1179 CE, as discussed in Chapter 2.

suggest a literal meaning of “ritual” can be “(to make a) primary contact with the divine (so as to harmonize one’s-self with it; see Behuniak 2008, 55) through connecting sun, moon, and stars, in song over an offering of food.”¹¹⁰

While Confucius was strict in his adherence to propriety and ritual (*lǐ* 禮), he was clear that propriety and ritual served a harmonizing and tempering function for the idiosyncrasies of a unique individual, family, and social group, with each other and the cosmos (Behuniak 2008, 53). In this function, harmony (*hé* 和) is paramount—beyond any empty, rigid, dogmatic form (Behuniak 2008) which ritual can so easily become when performed without connection to the original purpose for connection and context to community and larger organic patterns. Ritual and propriety need a kind of thoughtful, continuous developmental flexibility in practice and execution to retain vitality, attunement, and musicality.¹¹¹ Ritual that becomes rigid and unresponsive to the change (*yì* 易) of organic patterns (*lǐ* 理) through rigidity and dogma, loses its vitality in disconnection, context, and dissonance (the antithesis of harmony) with the moment and dies (Behuniak 2008, 53–55.)

¹¹⁰ See Chinese terms glossary entry for *lǐ* (禮) and associated sources.

¹¹¹ I am using musicality in a broader sense than just playing instruments; but to imply features, a topography of music. Resonance, harmony, sound, that were critical parts of Confucian ritual or *lǐ* (禮) (Behuniak 2008, 49–58). See Appendix B for the importance of music in *lǐ* (禮).

***Míng Lǐ* 名理: “Study of analysis of terms”**

I gained a great appreciation for this term through discovering the etymology of *míng* (名). There is a power to naming things that makes them more concrete to our thinking mind. Naming is an explicit, discriminating, and delimiting exercise; it separates, in an arbitrary way, “something” from “everything else.” Naming is a focused and precise left hemisphere activity.¹¹² Etymologically, *míng* (名) is a combined pictograph of a crescent moon over a mouth, that evokes the idea of story-telling at dusk, during the evening meal after a day of work (Harbaugh 1998, 216). Thus, one meaning of *míng* (名) is to “become famous” or “well-known” (*Nciku Dictionary* 2013), presumably through the stories and news people would tell one another in this setting.¹¹³

Míng lǐ (名理) would then be the “organic pattern” of these stories (explored further in Chapter 6), and the stories told of the patterns of people’s behaviors. It is also understandable how language itself would be found to have a pattern, and that the School of Names would be based on the exploration of linguistic patterns.

***Dào Lǐ* 道理: “Natural Principle/Pattern”**

The term *dào* (道), also known to Western readers as “Tao,” is central to Chinese philosophy, and yet remains one of the most enigmatic. The Dàoist sage

¹¹² See Appendix A on brain hemisphericity and function.

¹¹³ Sources for the study of *míng* (名) will be found in Appendix B.

Lao Tzu, in the first chapter of a seminal Dàoist text known as the *Dào de jing* (道德經) (translated as “The Classic of Virtue and the Way”) says “The Dào that can be spoken of is not the actual Dào.” Perhaps the most common way of translating this term is as “the Way.” (e.g., Lynn 1999, Bahm 1976). Dr. Yi Wu (2009b) has said many times, “[While] we cannot *know* the *dào* (道), we can know the *function* of the *dào* (道)”¹¹⁴ and “the *dào* (道) makes space for things”¹¹⁵ In Dr. Yi Wu’s (1986) book on Chinese philosophical terms, he states “*Lǐ* (理) does not appear in the *Lao Tzu*,¹¹⁶ but the Way [*dào* 道], as Lao Tzu used it, meant the *lǐ* (理) of all things” (102).

Dr. Yi Wu also cites two places where *lǐ* (理) “is used as a definition of the way [*dào* 道], ‘The Way [*dào* 道] is *lǐ* (理)’” in *Zhuangzi*, Chapter 16 (Y. Wu 1986, 102). First, he cites this passage: *Fǔ dé, hé yě; dào, lǐ yě. Dé wú bù róng, rén yě; dào wú bù lǐ* (or 夫德，和也；道，理也。德無不容，仁也；道無不理) (Zhuangzi 2013, paragraph 2). This is literally translated as follows: “Men virtue, harmony also; Way, Pattern also. Virtue not not appear, humanness also; Way not not pattern.” These two last phrases shows the not-uncommon Chinese

¹¹⁴ I discuss the idea of the *function* of the *dào* (道) in the Chapter 7 on resonance and harmony. The function of the *dào* (道) is a function of Chuang-Tzu’s “forgotten self”: that when one forgets the self, one becomes *functionally transparent* to the *dào* (道), as an *expression* of the *dào* (道), in the space made by the *dào* (道; Watson 1968, 57–58).

¹¹⁵ Dr. Yi Wu made this statement in many classes I took with him at the California Institute of Integral Studies in San Francisco, 2008–2010 (e.g., Y. Wu 2008a, 2008b, 2008c, 2009a).

¹¹⁶ also known as the *Dào dé jīng*, (道德經), literally, the classic of the way and virtue.

use of the double-negative to soften an otherwise direct assertion that seems to have a more diffuse and penetrating communicative quality than a simple positive declarative statement (Wu, 2008c). In the second passage, Dr. Yi Wu cites, “Those who know the Way [*dào* 道] are certain to understand *lǐ* (理)” (Y. Wu 1986, 104). Literally, this can be translated as follows: *Zhī dào zhě bì dá yú lǐ* (or 知道者必達於理)(Zhuangzi 2013b, paragraph 2.) Wisdom way they surely arrive at be[ing] pattern.” Here again *lǐ* (理), as the idea of organic pattern, is woven together with wisdom *zhī* 知, to demonstrate that wisdom *zhī* (知) comes from attending to organic pattern *lǐ* (理).

In an additional example of the compound word *daò lǐ* (道理) or “natural principle” in Burton Watson’s (1968, 369) translation of Chapter 33 of the *Zhuāng Zǐ*, a forerunner of Legalist thought, Shèn Dào,

discarded knowledge, did away with self, followed what he could not help but follow, acquiescent and unmeddling where things were concerned, taking this to be the *principle of the way*.¹¹⁷ “To know is not to know,” he said, and so he despised knowledge and worked to destroy and slough it off.¹¹⁸ (370)

Shèn Dào, in this passage of the *Zhuāng Zǐ*, found that sloughing off [sharply focused and explicit] knowledge was consistent with the organic pattern of the

¹¹⁷ See Appendix B for the term *lún* (倫).

¹¹⁸ Literally, this passage is translated as *Shì gù Shèn Dào, qì zhī qù jǐ, èr yuán bù dé yǐ, líng tài yú wù yǐ wéi dào lǐ, Yūe: “Zhī bù zhī, jiāng bó zhī ér hòu lín shāng zhī zhě yě”* (是故慎到, 棄知去己, 而緣不得已, 泠汰於物以為道理, 曰: “知不知, 將薄知而後鄰傷之者也”). The literal translation is: “Straight old Shèn Dào, reject knowledge leave self, and follow not get stop, mild excess be thing use make Way organic-pattern. [He] said: Knowledge not knowledge, take slight knowledge and leave behind neighbor wound also!”

daò (道), or “natural pattern,” to use my speculative translation of the character *lǐ* (理) as “organic pattern.”

***Lún Lǐ* 倫理: Ethics (Five Confucian Principles of Relationship, also Described as *Wǔ Lún* 五倫)**

In Dr. Yi Wu’s (1986) discussion of the character *lǐ* (理), *lún lǐ* (倫理) (literally, “relationship patterns”) expresses the ethics of the *wǔ lún* (五倫), or Five Confucian relationships, which are as follows: ruler/subject, parent/child, husband/wife, elder sibling/younger sibling, and friend/friend. The literal meaning of *lún* (倫) is an orderly union with members of a group.¹¹⁹ To keep this order, then, it can be understood that specific patterns and protocols of relationship need to be followed. From these specific protocols of relationship, the idea of ethics could be derived; if one were unethical, (i.e., acting other than in the expected pattern of relating to another) such relationships would be injured. These relationships have an organic, self-organizing, self-similar quality to them, which radiates out from the cultivation of oneself (through completing wisdom in inhabiting organic pattern, as discussed in Chapter 6) through the social fabric of the culture, as stated in one of the Four Books of Zhū Xī, the *Great Learning* (or *Dà Xué* 大學; e.g., Gardner 1986, 1990, 2007; Chan 1973, Fung 1973, Hughes 1943).

¹¹⁹ see glossary in Appendix B for an explanation of the term “*lún* (倫)”

***Tiān Lǐ* (天理): Heavenly Principle/Pattern**

The etymology of the character *tiān* (天) is that of a person standing under the one sky.¹²⁰ In Dr. Y. Wu’s (1986, 102) discussion on *lǐ* (理), (on the first use of the combination character *tiān lǐ* 天理 or “heavenly principle”) he quotes the *Records of Propriety* (*Classic of Rites* or *Lǐ Jì* 禮記) in the section on the *Records of Music* (*Yuè Jì* 樂記): “Man is changed by things; they destroy Heavenly *lǐ* [理] and exhaust him with desires” (Y. Wu 1986, 104). Being changed by things and exhausted with desires means that without some internal discipline, a person’s connection with heavenly patterns is lost by following desires. That is, through distinguishing experience as internal and external, and separating one’s self from external things, one comes to desire that which one does not have—and loses the connection with the larger pattern of the cosmos, of which we are a part (Y. Wu 1986, 104).

***Xìng Lǐ* (性理): Principle/Pattern of Human Nature**

The etymology of the character *xìng* (性) is that of the heart-mind (*xīn* 心) with a pictograph of a plant, (*shēng* 生). *Shēng* (生) also means life, to give birth.¹²¹ So *xìng lǐ* (性理) could literally be considered birth-life-organic growth-pattern.

¹²⁰ See Appendix B for explanation of the term “*tiān* (天).”

¹²¹ See Appendix B for explanation of the term “*xìng* (性).”

Dr. Y. Wu (1986) shows important correlations of the terms *xìng* (性), and *lǐ* (理); *xìng lǐ* (性理), in that Sung Dynasty Neo-Confucianists equated Heavenly *lǐ* (理) with human nature (*xìng lǐ* 性理) and human nature with Nature.

Nature is just *lǐ* [理]; it is the generic name of the ten thousand *lǐ* [理]. This *lǐ* [理] is just all of the common *lǐ* [理] between Heaven and Earth.... Because the Neo-Confucianists united Nature (*Xìng* 性) with *lǐ* (理), their theories were called the learning of Nature-*lǐ* (性理). (Y. Wu 1986, 104)

Chan (1973) corroborates Dr. Yi Wu's correlation of the compound word *xìng lǐ* (性理):

Neo-Confucianism, the full flowering of Chinese thought, developed during the last eight hundred years. Its major topics of debate, especially in the Sung (960–1279) and Ming (1368–1644) periods, are the nature [*xìng* 性] and principle (li [*lǐ* 理]) of man and things. (For this reason it is called the School of Nature and Principle, or *Hsing-li hsüeh*¹²² [*Xìng-lǐ xue* 性理學]). (Chan 1973, 14)

Here Chan (1973, 14) shows the School of Nature and Principle, *Xìng-lǐ Xué* (性理學) as one of the closely related schools referred to under the generalized term of Neo-Confucianism, also in Chapter 2 under the heading of Neo-Confucianism.

The Anthropocentrism of Wang Yangming and Xīn Xué (心學) (School of Heart-Mind)

In this book, it is not my intention to provide an exhaustive argument about the philosophy of the Neo-Confucianism of Wang Yangming that is in

¹²² Chan (1973, 14) uses the Wade-Giles style of romanization of Chinese characters. To retain consistency in this project I here restate the romanization of the Chinese characters, using the standardized pinyin style of romanization.

contrast to Zhū Xī.¹²³ Yet, because Wang Yangming’s “School of Mind” appears in contrast to Zhū Xī’s “School of Principle,” it seems appropriate to offer a short rationale of my sense of the differences.

Wang Yangming developed ideas of the cosmos as *xīn* (心) (heart-mind), for what is called the “School of Heart-Mind” or *Xīn xué* (心學). (e.g., Wang 1963, Chan 1973, 573; Huang 1999, 14, 76, 85, 120, 209–10; de Bary and Bloom 1999, 855–57). It is correct to say that human beings relate to, have relationship with, and thus have connection with the cosmos *through* *xīn* (心). From the vantage point of human beings, the cosmos is perceived by, and related with, through an entirely anthropomorphic sensibility. Yet, I speculate that this unconsciously presupposed anthropocentric view cannot be accorded to any relationship in the cosmos that is other than strictly human. In other words, a quality of “organic patterning” of *lǐ* (理) *supercedes* that of *xīn* (心). In the strictest sense, *xīn* (心) (heart-mind) is an *example* of but *one* of the *lǐ* (理) organic patterns of the cosmos, rather than the organic patterns of *lǐ* (理) being an example of *xīn* (心) (heart-mind).¹²⁴

¹²³ “According to Chu Hsi, there is no anthropomorphic will of heaven” (Moran 1984, 177).

¹²⁴ See end of Chapter 7, Section on Lù Jiǔ Yuān (陸九淵), for further discussion on “School of Heart/mind *Xīn Xué* (心學) as contrasted with *Lǐ Xué* (理學) “School of Principle/Pattern.”

Summary

In this chapter, I provide support for my argument that the character *lǐ* (理) finds its greatest harmony and resonance with the Chinese philosophical organismic model of the cosmos (Mote 1971, 20; Needham and Wang 1956, 412) through in-depth translation as “organic pattern.” This translation stands in contrast to what seems to be a less than complete and somewhat less layered translation of *lǐ* (理) as “principle” or “law.”

Finally, I propose that in the use of *gé wù* (格物) in the *Great Learning*, a translation of “patterning things” or “patterning being,” may go a great distance toward understanding and un-covering what Zhū Xī thought Confucius meant to convey with these characters in the *Great Learning*.¹²⁵ The Cheng brothers’ ideas of patterning are discussed in Chapter 2 in context with coming to know the similarities and sameness of organic patterns of the natural world and the internal world.

¹²⁵ See Chapter 6 for a further discussion about this thought.

Chapter 4: Complexity Science: Complex Non-Linear Dynamical Systems

Complexity science is described as the study of *non-linear complex dynamical systems*. A *system* is a series of inter-related elements, with a simple system having few elements and a complex system having many elements. The more elements a system has, the more complex the interactions within that system. Dynamics concern how a system responds to input. A linear system will respond on a one-to-one basis, with an output that corresponds to the input. A *non-linear dynamical system* will respond on a one-to-many basis; with a simple input, the output of a dynamical system will be quite complex (e.g., Mandelbrot 1977, Schroeder 1990, Bak 1996, Barnesley 1988, Bar-Yam 1997).

Systems are *purposive*, that is, they tend to have some output that is associated with an input.¹²⁶ Self-organizing systems have an output that is organized “through interactions internal to the system, without intervention by external directing influences” (Camazine 2001, 7). “Self-organization refers to a broad range of pattern-formation processes in both physical and biological systems” (Camazine 2001, 7). Ilya Prigogine (1977) was awarded the Nobel prize for his work with self-organizing systems in far-from-equilibrium states.

A system that is far-from-equilibrium is a system which is has a built up energetic potential, and is releasing energy as an output of the system, until no further energy remains to be expended by the system. While the state is in the process of expending energy, the system is considered far-from-equilibrium. In

¹²⁶ In the case of organic systems, the purpose is survival.

the process of releasing its energy in the far-from-equilibrium state, the flow of energy from the system tends to self-organize, without outside influences. When all of the energy has been expended by the system, the system is considered to be at equilibrium. One example of a system that is far-from-equilibrium would be a stream flowing downhill to the ocean, where eddies and whorls form spontaneously, self-organizing in the water from features on the stream bed. The stream reaches equilibrium when it reaches the sea (or a terminal lake that has no outlet).

Complexity science undertakes the study of complex non-linear dynamical systems, and the patterns these systems produce. Understanding the patterns non-linear dynamical systems produce can greatly facilitate understanding the operations and structures of these complex systems that is otherwise unavailable through more Western, rational, and linear means. Prior to the development of complexity science, many non-linear systems and products of non-linear systems (e.g., weather patterns and the stock market) were considered too complex for linear science to effectively understand, for predictive purposes (e.g., Mandelbrot 1977, Lorenz 1993).

Making Mathematical Models: Utility and Application

Complexity science uses mathematical models to model the natural world and the self. As my friend Dr. Gareth Loy has said, “mathematics is reasoned analogy” (conversation with author, June 2009) but an analogy to what? Mathematics is reasoned analogy to a component of the modeling process of the inner and outer world. In other words, mathematics is a *re-presentation* of

something else. In everyday life, one attempts to make sense of one's life experiences by developing analogies, x is "like" y . "My arm and fingers are like the branches and twigs of a tree." Lakoff and Núñez (2000) suggest that mathematics arises from our very physiology. The statement "I have five fingers on my hand" is a re-presentation of an appendage of my body that I choose to call a "hand," with "fingers." It is not the actual appendage.

There are patterns of the cosmos that humans have discovered that are usefully worked with through analogical modeling of those patterns. The first predominant system of mathematical modeling in the West was Euclidian-Newtonian-Cartesian, a system that treated the world as a machine—reflecting the presuppositionally embedded subject-object split. Mathematical modeling originally developed as a device for the designation of difference, and eventually likeness, between elements. Boyer (1991) says,

at one time mathematics was thought to be directly concerned with the world of our sense experience, and it was only in the nineteenth century that pure mathematics freed itself from limitations suggested by observations of nature. It is clear that originally mathematics arose as a part of everyday life. (2–3)

In a major development in mathematical modeling, Georg Cantor escaped into what he considered the abstract realm of mathematics. Cantor found this freedom from the limitations suggested by observations of nature in Newtonian natural science of the nineteenth century (Boyer 1991, 2–3), in the development of set theory, in 1875. Set theory offered potential liberation into an infinite and intuitive richness of mind, through the addition of infinite recursion. Recursion is taking the product of a mathematical formula and feeding it back *into* the formula which results in another product. When this is done an infinite number of times,

the set of products show an infinite *process*, rather than a single static figure or point. A simple example is the Cantor set.¹²⁷ Other recursive formulas would prove difficult if not impossible to execute without the capability of rapid and repetitive calculations available only through the development of the electronic computer.

In his groundbreaking work, *The Fractal Geometry of Nature*, Benoit Mandelbrot (1983) discusses this “mathematical crisis of the 19th century” where the mathematical structures of Cantor, Koch, Sierpinski, Menger, Peano, and others were thought to be:

“pathological” and a “gallery of monsters”...The mathematicians who created the monsters regarded them as important in showing that the world of pure mathematics contains a richness of possibilities going far beyond the simple structures they saw in Nature. Twentieth century mathematics flowered in the belief that it has transcended completely the limitations imposed by its (Newtonian) natural (science) origins. (Mandelbrot 1983, 3)

Thought initially to be naïve, Cantor’s set theory and the paradoxes that accompanied it were mathematically contextualized (one could possibly say, validated and liberated) by Kurt Gödel in 1926. Gödel’s “incompleteness theorem” essentially said that a system could not completely be determined from within the system (Hofstadter 1979, 86). By adding a component of recursion—that is, by taking a product of a formula and adding it back in to the formula over and over again “ad-infinitum” (Swift 1733/2007, 20)¹²⁸—one can transcend the

¹²⁷ Please see Appendix D for a description of the process of the Cantor set.

¹²⁸ See etymological reference of Swift in Chapter 1.

limits of the system (F. Abraham 1995, 168). This can be seen physically in the form of a fern, where the basic shape of the fern is an isosceles triangle, and the compound leaves are also isosceles triangles, as are the leaflets that make up the leaves also isosceles triangles. The whole fern is seen as more than its parts.

In escaping the Newtonian natural science of the nineteenth century, however, the development of set theory uncovered deeply embedded organic patterns that accurately show the actual structures of the natural organic patterns of the cosmos.

Mandelbrot quotes Freeman Dyson:

Now, as Mandelbrot points out...Nature has played a joke on the mathematicians. The 19th-century mathematicians may have been lacking in imagination, but Nature was not. The same pathological structures that the mathematicians invented to break loose from 19th-century naturalism turn out to be inherent in familiar objects all around us. (Dyson, as quoted in Mandelbrot 1983, 3–4)

These pathological structures are fractals found in nature, in the shapes of ferns, rocks, clouds, trees, water, and more. The joke was the world the nineteenth century mathematicians escaped into (through the inclusion of infinity) was the *actual* accurate modeling of the organic patterns of the natural world, rather than the previously limited, mechanistic models of the world. Curiously and gratifyingly, psychologists working with complexity science have discovered that patterns of human consciousness *itself* can be modeled by fractal geometry and complexity science (e.g., Marks-Tarlow 1999, 2008) and that these complex models of *consciousness* and *self* are not limited by degrees of scale of organic

pattern.¹²⁹ As is shown in Chapter 6, wisdom also is not limited by degrees of scale, as wisdom refers not only to the natural world, but is inclusive of the self.¹³⁰ As psychologist Terry Marks-Tarlow (1999, 2008) points out, [along with the natural world] it is the self in which the infinities of scale of fractal geometry are also realized. Marks-Tarlow describes how her clients are sometimes initially daunted by the seeming immensity of the task of embarking on an exploration of the self. “The more you look [into the self],” she says, “the more there is to see” (Marks-Tarlow 1999, 339).

Fractal Geometry: Development and Use of Computer Technology in Exploring Fractal Geometry

Complexity science and chaos theory only developed in the last quarter of the twentieth century—Cantor, Sierpinski, Koch and Julia were unable to develop their mathematical infinities further because they did not have access to the modern digital computer. Though the promise of the ubiquitous, underlying patterns of the cosmos as shown by complexity science was present in the initial work of these pioneers (Bar-Yam 1997, xi), until the advent of the modern digital computer, there was no way for these mathematicians to calculate the massive cycles of iteration of their formulae, to show the patterns that were latent within. (e.g., Lorenz 1993, 114). Such calculations are simply too large to be done manually.

¹²⁹ See the complexity science glossary (Appendix D) for an explanation of what is called scale-invariance.

¹³⁰ See Chapter 6, Knowledge and Wisdom.

What are fractals?

In the everyday world, people are used to thinking in three Euclidian dimensions represented by integers: 0 for a point; 1 for a line: length; 2 for a plane: length and width; and 3 for a cube: length, width, and depth. I joked once with Terry Marks-Tarlow that everyone seems to be in a sort of Euclidian trance, thinking of everything one sees in terms of three dimensions.

The term *fractal* was coined by Benoit Mandelbrot in his book *The Fractal Geometry of Nature* (1983), and was first discussed by him in 1967 in his paper “How Long Is the Coast of Britian? Statistical Self-Similarity and Fractional Dimension” in the journal *Science*. “Fractal” is a contraction of term “fractional,” to be a fraction of a dimension. In his article on the coastline of Britian, Mandelbrot (1967) showed that the length of any coastline is *indeterminate*, depending on the size of the unit of measure used to measure the coastline. The so-called “coastline paradox” is that as the size of the unit of measure reaches zero, the length of the coastline becomes infinite. In the West, prior to the advent of fractal geometry, precision in measurement of observed phenomena had been a critical component of the scientific endeavor. The coastline paradox is relevant to fractal geometry in showing how any measuring scheme shows indeterminacy of what is measured (Figure 8).

Examples of fractal figures

A fractal is a fractional dimension, originating with the Latin term *fractus* (to fragment). A fractional dimension is *between* dimensions represented by whole integers. A figure that has fractional dimension has a quality of filling a

greater dimension than the smaller integer, but does not completely fill the dimension of the next higher dimension.

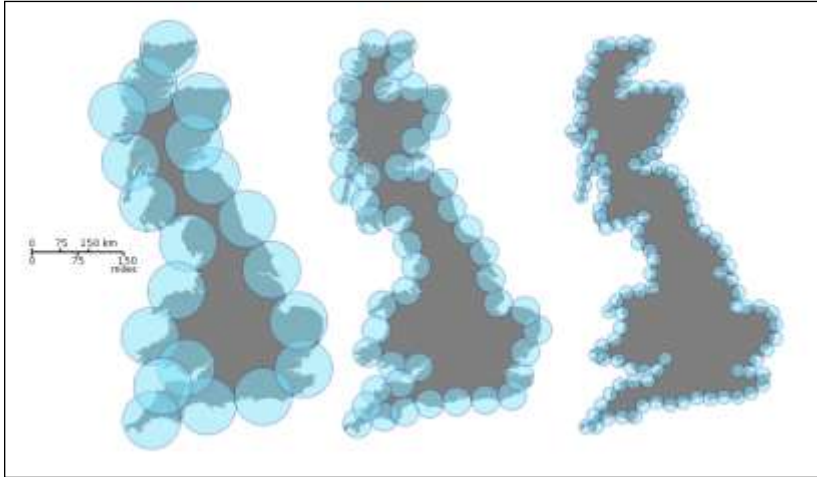


Figure 10. How long is the coastline of Britain?

Hausdorff dimensions illustrated on Great Britain's coasts in "Great Britain Hausdorff" (Prokofiev 2010). Reprinted with permission under the Creative Commons Attribution-Share Alike license.

The fractal dimension of the Cantor set (Figure 11) is 0.6309, as it is larger than a point but does not completely fill the dimension of a solid line (Schroeder 1990, 16).



Figure 11. "Cantor Set in Seven Iterations" (2007). Public Domain image retrieved from Wikimedia Commons.

The Cantor set is derived by taking a line, and after dividing it into thirds, removing the middle third. This operation is continued to infinity, yielding what is called "Cantor Dust" (Schroeder 1990, 16).

Mathematical “monsters” of increasing fractal dimensions follow. The Koch “snowflake” is a figure, though seemingly finite in area, whose boundary has literally infinite length (Schroeder 1990, 7-9).

Figure 12 shows the first four iterations. The fractal dimension of the Koch curve is 1.26, as it more than fills the dimensionality of a line, but does not fill the entire dimension of a plane (Peitgen, Jürgens, and Saupe 1992, 205).

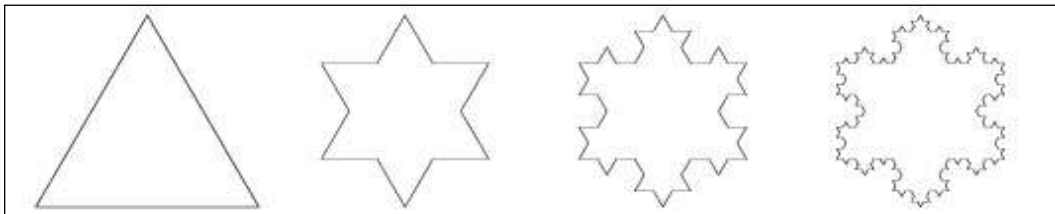


Figure 12. Koch snowflakes (“Koch Flake” 2007). Reprinted with permission under the GNU Free Documentation License.

The next “monster” is a Sierpinski triangle with a fractal dimension of 1.5849 (Schroeder 1990, 17). Figure 11 shows the first five iterations.



Figure 13. Sierpinski triangle (“Sierpinski Triangle” 2006). Public Domain image retrieved from Wikimedia Commons.

The next “monster” (Figure 12) is a Menger “sponge” developed by Sierpinski’s student Menger with a dimension of 2.73 (Schroeder 1990, 179-80).

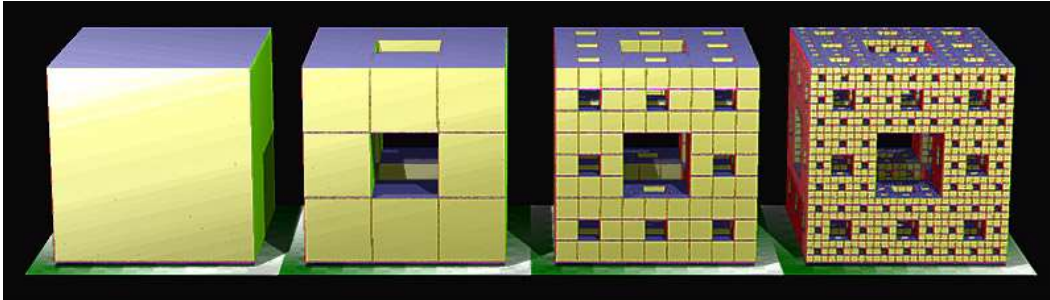


Figure 14. Menger sponge (Sokoll 2005). Public Domain image retrieved from Wikimedia Commons.

Julia Set: This is a graph of points from sets developed by Gaston Julia. The Mandelbrot set is a combining of all Julia sets (Schroeder 1990, 298).

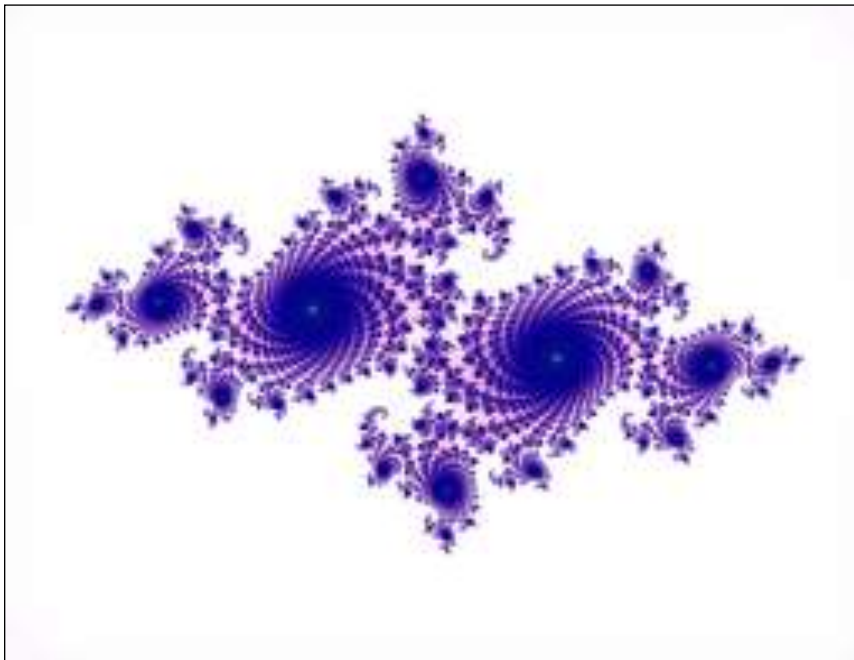


Figure 15. Julia set (Eequir 2005). Public Domain image retrieved from Wikimedia Commons.

Other familiar self-similar fractal items include broccoli, which has a fractal dimension of 2.66 (Elert 2002, conclusion), clouds at 2.35, the human brain at

2.79 (Grünberg 2004, 3), and the lungs at 2.97 (Sapoval and Mandelbrot 1997, table: Random and natural fractals).

With the advent of complexity science, it is now possible to accurately model natural organic systems and structures such as clouds, mountains, trees, coastlines, and even consciousness itself. These systems and structures are much more complicated (infinitely so!) than the possibilities of the limited dimensions of single integer of Euclid and approaches of Newton, and Descartes, described as “natural” mathematics of the mid-nineteenth century and before. The real breakthrough of Cantor and others in the late nineteenth century, was that they made good their escape from Euclid and Newton, from “natural” mathematics. (e.g., Mandelbrot 1977, 3; Maddy 1997, 3–35; Boyer 1991, 563).

Why is [Euclidian] geometry often described as “cold” and “dry?” One reason lies in its inability to describe the shape of a cloud, a mountain, a coastline, or a tree. Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in a straight line.

More generally, I claim that many patterns of Nature are so irregular and fragmented, that, compared with [Euclidian geometry], Nature exhibits not simply a higher degree but an altogether different level of complexity. The number of distinct scales of length of natural pattern is for all practical purposes infinite. (Mandelbrot 1977, 1)

Here, Mandelbrot suggests that the infinity of natural organic patterns can be understood or modeled through the development of complexity science and fractal geometry, which is impossible to do in the single integer dimensionality of Euclid.

Complexity Models of the Cosmos and the Self

With all of this context in place, one may now contemplate the possibility of broadening one’s awareness and experience through the richness of developing

fractal models of the world—and because one is in and of the world, and other than separate from it, one can also contemplate and develop fractal models of the self. I begin by discussing models of the natural world, and progress to talking about models of the self, taking some time to develop this purposely imprecise word “self.”

In his studies of self-similarity, Mandelbrot (1983) mainly noticed the *roughness* of the world. By roughness, in his initial explorations, he meant non-periodic or non-repeating cycles of what had been previously called “noise” that disrupted otherwise “smooth” graphic plots of system responses. He noticed it in telephone signals, in commerce, in biology, and in geology. Roughness in biology is, for example, the texture of the bark of a tree—the tree is not a smooth cylinder.¹³¹ Roughness in geology is the irregular texture of a mountain and the rocks on the mountain. The mountain is not a Euclidian cone. This roughness he noticed in these seemingly disparate fields of study, was *self-similarity*, across *infinite* levels of scale. In meteorology and cloud forms, there are puffs within puffs within puffs of cloud, each repeating (yet not always exactly) the features of scale of forms both larger and smaller in scale (see Mandebrot 1983, Bak 1996). As shown above, fractal geometry allows the measurement of the natural roughness of geologic and meteorological features. By the same token, it allows us to measure roughness in biology and physiology as well.

¹³¹ While some trees seem to have very smooth bark; there is not *continuous* or “perfect” smoothness as one would find in the Euclidian mathematical cylinder.

Mandelbrot's work opened up new avenues for researchers and practitioners. In meteorology, turbulence became measurable (Lorenz 1993; 136, 139, 167, 183) through the use of fractal geometry, allowing scientists to begin to better understand weather patterns. Erosion and river-flow patterns have a fractal dimension, as do mountains and valleys.

As further examples of fractal dimensions of turbulence, the patterns in marble and jade were formed while the rocks were still molten, and exhibit all the characteristics of turbulence in gasses and liquids. These lovely patterns are now, in the cooled rock, turbulence that is frozen in time. These fractal, self-similar patterns are also found in the biosphere, from fungi to plant life to living creatures, including ourselves (e.g., Marks-Tarlow 1999, 2008, 2012). Moreover, in parts of the collective human organism, one can see fractal patterns of stock market fluctuations over time (Schroeder 1990, 126).

Fractal geometry of the self.

To begin this portion of the discussion, I discuss the somewhat purposely imprecise term, "the self," as it is used to refer to an individual human's being. This term raises hackles on some readers by the very nature of its imprecision, yet I choose to employ it *for* the very imprecision that it embodies (McNeill and Freiburger 1993, 41). The self is very different from one alternative, "the psyche"; perhaps the term psyche is more precise in a psychological sense, yet a discussion of complexity science and fractal geometry in regard to the self requires terms that are not constrained or narrow (Marks-Tarlow 2008b, 147–49; 2012, 225). I spoke with Dr. Terry Marks-Tarlow as to the proper usage of the terms "psyche"

and “self.” Drawing on her decades of experience as a clinical psychotherapist, Dr. Marks-Tarlow said that *psyche* as a psychological term has gradually fallen out of favor since the 1970s and 1980s; only Jungians still use the term *psyche* with any regularity. Throughout the balance of the psychological community at present, the psychological referent term *self* is predominant (personal communication, February 2011).

For this book, I prefer and use the term “the self” because *self* can be seen as fractal, self-referential, and self-similar. See Figure 14 for a lighthearted depiction (Crespo, 2013, as inspired by Sempé 1985, in Schroeder 1990, 238).

The term *self* can be used to designate a single individual, or a group, or the cosmos. The references to the nature of the multiple *self* is shown in key passages in Confucius’s *Great Learning*, the work of John Welwood (2008a, 2008b, 2008c), and twentieth-century French philosopher René Guénon (e.g., *The Multiple States of Being*, 1984), and is explored in Chapters 2, 6, and 7. In this “imprecision” of *self* there are multiple layers of meaning that can be implied, and I employ those multiple layers in emulation of a similar cultural structure in Chinese terms, where multiple meanings are also embedded in words (Ames 2008, 37–48).¹³²

¹³² This quality of multiply-layered embeddings of meaning in Chinese terms is known as *paranomasia*.



Figure 16. “Thinking of Her Thinking of You.” Drawing by Jamie Crespo (2013); reprinted with permission. Artwork inspired by Sempé 1985, as quoted in Schroeder 1990, 238.

In Chinese terms, it is commonly accepted that the meaning of a word is largely dependent on its context¹³³—but I have also discovered that enfolded multiple meanings are available to those who have different levels of philosophical development (discussed further in Chapters 2, 5, and 6; see also Ames 2008, 37–48). To study “the self” in Western philosophy and psychology, it is useful to consider the origins of depth psychology in the West. As with other perspectives of natural organic pattern in Western philosophy, Western psychology developed along lines similar to Western science. Western psychology now benefits from the research and developments of models of complexity science.(e.g., Marks-Tarlow 1999, 2008, 2012).

Origins of depth psychology.

The origins of modern depth psychology can be traced from Anton Mesmer and his research on “animal magnetism.” Though Mesmer was discredited (Crabtree 1993, 21), many of the things he discovered about human suggestibility held some truth and were further developed in the study of hypnosis in France in the eighteenth and nineteenth centuries. Practitioners such as Pierre Janet, Hyppolite Bernheim, Ambroise-Auguste Liebault, and neurologist Jean Charcot were developing hypnotic techniques to work with maladies they termed “hysteria.” While Charcot was at the Salpêtrière hospital in Paris, a young Viennese student named Sigmund Freud came to study with him in 1885, and was

¹³³ Please see Chapter 7 for the term “harmony” or *hè* 和 in connection with “context.”

instructed in the use of hypnosis in treatment of patients (e.g., Crabtree 1993, ix–x, 351–60).

Alas, Freud was less than skilled in his use of hypnosis on his patients, in particular with a young woman, which led him to abandon the use of hypnotic techniques (e.g., Crabtree 1993, 352). In developing what he considered to be a less hazardous approach to gaining access to the “unconscious mind” he then developed—depth (analytic) psychology.

Freud’s student, Carl Jung, broke from Freud in 1913 and made significant advances into the development of an archetypal psychology. Jung was an extraordinarily prolific writer as evidenced by the twenty volumes of his collected works and the additional volumes of his collected letters. The recent release of what is known as *The Red Book* (Jung and Shamdasani 2009) is a compilation of Jung’s personal journals. *The Red Book* details his extraordinary and courageous explorations into his own unconscious mind, that led him to attend to images from the collective unconscious. Jung wrote an introduction to the Wilhelm-Baynes translation of the *I Ching* (Wilhelm and Baynes 1967, xxi–xxxix). Jung’s (1973) speculations on synchronicity and acausality connected to his study of the *I Ching* brought this book of Chinese philosophy to the attention of Western readers. Western interest was not captured in the same way by James Legge’s (1963) earlier translation of the *I Ching* which was originally published in 1899.

While behaviorism began to take hold in psychology (e.g., Pavlov and Fol’bort 1928; Skinner 1953), psychiatrist Milton H. Erickson, MD, a seminally skilled proponent of clinical hypnosis, emerged in the 1930s. Erickson was a

student of Clark Hull (1933) who wrote *Hypnosis & Suggestibility*. Erickson (1932) first published on the topic of hypnosis in the early 1930s, and founded the American Society of Clinical Hypnosis (ASCH) in 1956 (*American Journal of Clinical Hypnosis* 1956), with an interest towards legitimizing the practice of hypnotherapy in psychotherapy through the education and training of licensed clinical practitioners, to distinguish the practice of clinical hypnosis from that of “lay practitioners” of hypnosis.

While Erickson (1956) did not deal specifically with complexity science, as Mandelbrot and Lorenz came to discover and utilize it in the 1960s and 1970s, Erickson’s primary student and co-author of many of Erickson’s books, psychologist Ernest L. Rossi, incorporated chaos theory¹³⁴ in his books beginning with his book *The Psychobiology of Mind-Body Healing* (Rossi 1993, 253, 287) and continues an expanded discussion of chaos theory in *The Psychobiology of Gene Expression* (Rossi 2002, 61–62, 166, 182–86, 204, 335–36, 346, 436–37). Rossi (2002) discusses the utility of chaos theory as a way to attend to the health of a system, and that a system is most healthy when perched on the edge of chaos, that is when the system has “non-linear chaotic variability” (62). Without such “chaotic variability” there is a loss of capability to flexibly interact with the internal and external worlds (62).

In 1982, when complexity science was just beginning to develop, brothers Ralph Abraham at the University of Vermont and Fred Abraham at University of

¹³⁴ Complexity science was also known at the time, by the term of a subfield, as “chaos theory” (Lewin 1992, 12).

California at Santa Cruz began to use tenets of non-linear dynamical systems to begin to examine psychological states. They noticed that many of the structures being utilized to model natural phenomena were also useful in modeling the psychological patterns of students and patients, and had relevance to studying the patterned functioning of the mind and unconscious mind (F. Abraham, Abraham and Shaw 1990).

One recent practitioner who developed the Abraham Brothers approach of modeling the processes of self using complexity science is clinical psychologist, Terry Marks-Tarlow—it was her work that drew me to one of the main topics of this book, particularly her paper “The Self as a Dynamical System” (Marks-Tarlow 1999). In her work, Dr. Marks-Tarlow emphasizes *bi-camerality* (discussed in Jaynes 1976), or attending to the functioning and integration of the right and left hemispheres in their respective capabilities.¹³⁵ Her subsequent paper “Semiotic Seams” (2004) and books *Psyche’s Veil* (2008) and *Clinical Intuition in Psychotherapy* (2012) serve to strengthen the parallels I perceive between complexity science and Chinese philosophy.

Marks-Tarlow (1999) states that in the current literature of Western psychology, the self is increasingly described in a *context* with relationships with others and with the environment, which was less the case with earlier, reductionist models of the self. The self is no longer examined as an element isolated from the environs and systems from which it emerges. The self is considered to be

¹³⁵ Current (as of 2013) discussion of brain hemisphericity is found in McGilchrist (2009) and J. Taylor (2008); please also see Appendix A.

“entirely process oriented and content free...the self emerges from chaotic roots through the process of self-organization during multiple iterations of brain process, perceptual, and social experience” (313). Among other features, the fractal dynamics of the self show “self similarity and scale invariance as well as paradox and recursion” (313). In “Semiotic Seams” (2004), Marks-Tarlow suggests

fractal geometry...as an underpinning for a dynamic unconscious destined never to become fully conscious. Everywhere in nature, fractal separatrices articulate a paradoxical zone of bounded infinity that both separates and connects nature's edges...I suggest that the property of self similarity, by which the pattern of the whole permeates fractal parts at different scales, represents the semiotic sign of identity in nature. (49)

This view is consonant with the Confucian worldview, which Tucker (Tu and Tucker 2003) describes “as encompassing a continuity of being between all life forms, without a radical break between divine and human worlds...that is organic, holistic, and dynamic” (4). The Confucian worldview is discussed in Chapter 2.

Limits of Western Science: Knowledge and Wisdom

One of the tenets of complexity science is that the cosmos is simultaneously and paradoxically deterministic *and* unpredictable (e.g., Rossi 2002, 62–63; Loye 2000, 193; Kelly 1994). Because of this, verifiable, epistemic knowledge can serve only at levels and scales of relative simplicity; in the face of infinite complexity, epistemic knowledge must yield to the organic, holistic, and dynamic patterns that can be embraced by an ever deepening wisdom.¹³⁶

¹³⁶ See Appendix A on brain hemisphericity, and Marks-Tarlow (2012) in Chapter 7.

Therefore, traditional left-hemispheric meanings of and approaches to science *are limited to knowledge*: determinism states that if something is not verifiable, it is not science. From this left-hemispheric perspective and in largely in the West, wisdom is the domain of *philosophy*— as knowledge taken to an expanded metaphysical level, beyond explicit, sharply focused, explicit awareness.¹³⁷

Nonetheless, with a contextual, right-hemispheric awareness and consistent engagement with the patterns of the cosmos by a particular ethical alignment allows a relevant and valid *inhabiting* (Welwood, 2008a, 2008b, 2008c) of the cosmos. Ethical alignments might be given religious labels such as becoming a monastic or “mystic,” or becoming a “Sage” or taking the vows of a bodhisattva, but underneath those labels a person aligns to that which is most life-giving to the cosmos as a whole, and in fact can shift *identity* to encompass the cosmos; ethical alignment then produces an awareness of what is valid and correct for the cosmos in the same way one knows what is appropriate for one’s own body. A number of books discuss the *inhabiting* process: Gardner (1990), *Learning to be a Sage*; Keenan (2011), *Neo-Confucian Self-Cultivation*; Ivanhoe (2000), *Confucian Moral Self Cultivation*; DeBary (1991), *Learning for One’s Self*; and Fingarette (1972), *Confucius: The Secular as Sacred*, among others.¹³⁸

¹³⁷ See Chapter 6 for a more complete discussion of knowledge and wisdom.

¹³⁸ See Chapter 7 for a detailed discussion of *inhabiting* the cosmos.

Though fractal patterns *seem* to stop at certain level of scale in the physical world (which is not to say that they actually *do*), perhaps at smaller scales (molecular), this does not preclude the possibility that different dynamical systemic fractals can be found. These different fractals may become evident in a shift from larger scales—across that “boundary” from macro to micro.

With the self seen as an emergent property of global relationships, fractal patterns *are* infinite in the domain of being. Wisdom can then be understood as an interactive, non-cognitive awareness of the infinitely complex, holistic, and dynamic organic patterns of the “system” of the cosmos.¹³⁹

Complexity Science Glossary

Please refer to the complexity science glossary (Appendix C) for discussions of additional complexity science terms and structures relevant to this book that are referred to in Chapter 5.

¹³⁹ See Chapter 6 for a more complete discussion of knowledge and wisdom.

Chapter 5: Parallels in Chinese Philosophy and Complexity Science

In the early 1980s the branches of science in biology, geology, physics, chemistry, and meteorology were beginning to find utility in the ubiquitous patterns of complexity science (Bar-Yam 1997); these patterns offered different modalities for studying structures and patterns in phenomena that had previously been inaccessible.¹⁴⁰ This chapter draws specific parallels between Chinese philosophy and complexity science.

Chinese Philosophy and Complexity Science Are Context-Based

As discussed in previous chapters, the basis of Chinese philosophy and complexity science is right-hemispheric and *context*-based.¹⁴¹ Though one element may be arbitrarily and momentarily examined, this examination of a single element is meaningless unless taken with the context of the whole. For example, one can look at a single wave on the ocean for a moment, but that wave must be perceived along with and as part of the entire body of water covering the Earth, as well as the land, the atmosphere, the moon, and so forth (and there are wavelets upon wavelets upon wavelets).

Complexity science and Chinese philosophy each offer a distinct yet complimentary perspective on natural organic patterns. In particular, I was interested in how each could serve to illuminate the previously difficult-to-

¹⁴⁰ See Appendix D and Chapter 4. While complex patterns of the natural world were available, they were not accessible without the extended computational power of modern computers (e.g., Lorenz 1963, Mandelbrot 1963).

¹⁴¹ See the Chapter 7 for additional comments on context, relationship, and harmony.

understand ideas of the other. I find a delight in offering some correlations between fields that had not previously been made in quite the way I have made them.

Inhabiting Organic Pattern and the Characters Gè (格) and Lǐ (理)

The discussion so far has shown the consistent utility in attending to the deeper translations of the characters *gè* (格) and *lǐ* (理) as “pattern” and particularly as “organic pattern.” These non-conventional translations¹⁴² imply the vitality of a living cosmos, much more than a conventional, linear, sharply focused, precise, and explicit Western understanding of *gè* (格) as “knowledge” and *lǐ* (理) as “principle.” Sharply focused and precise understanding does carry one part way to these deeper meanings, until one hits the paradoxical limits of concept.¹⁴³

Zen Buddhism offers an idea called “the gateless gate” that is useful for this discussion (Yamada and Huikai 1990), as it offers a method by which to transcend conceptual paradoxes. Sometimes problems of everyday life seem insurmountable and impenetrable. I have come to understand this impenetrability comes from attempting to approach a problem that is paradoxical with the

¹⁴² Please go to Chapter 1, footnote 19, for reference to “conventionality” in translations, and to the introduction of Chapter 6 for my approach to translation theory.

¹⁴³ An example of the utility of going beyond cognition and concept (because cognition and concept are limited to *thinking*) is the Zen *kōan*, where the teacher presents a statement to the student that is other than possible to solve with thinking alone. Once solved outside of thinking, the student enters a very different realm of understanding. (e.g., Yamada and Huikai 1990, xvii; D. T. Suzuki 1958, 36–37, 43; Tanahashi 1985, 300).

focused, linear, and sequential left-hemispheric mind.¹⁴⁴ What seems insurmountable and impenetrable as sequestered in paradox dissolves into laughter when understood with an enlarged right hemispheric contextual awareness, where one's awareness itself is a part of the entire context. One is thus able to *transcend* the exclusive, simplified, and reductive domain of explicit and precise left-hemisphere thinking¹⁴⁵ which labels *gè* (格) “knowledge” and *lǐ* (理) as “principle.” This state of being is “beyond” the “gateless gate”—is where knowledge is transcended into wisdom—and where principle, logic, and law are transcended and incorporated into complex organic pattern. It is with a both a (left-hemisphere) focused *and* (right-hemisphere) contextual sensibility that parallels between the organic patterns of complexity science and Chinese philosophy are best experienced, or *inhabited* (Welwood 2008a, 2008b, 2008c).

Tenets Shared between Chinese Philosophy and Complexity Science

Chinese philosophy *and* complexity science would say that a plant is an example and part of a larger context of organic pattern; a person can make no sense of the complete plant without its ecological context. Looking at various scales of organic patterns in ourselves and the world, one can see *self-similarity*—a primary parallel tenet directly shared by both complexity science and Chinese philosophy (for Chinese philosophy, see Gardner 1986, 2007; Hughes 1943;

¹⁴⁴ Zen Buddhist teachers will sometimes offer cognitive paradoxes (known as *kōans*) for students to contemplate, to gain practice in transcending paradox.

¹⁴⁵ Exclusive, left-hemisphere thinking can be found everywhere, in the West as Cartesian dualism and in Chinese philosophy as legalism and “textual study.” See Appendix A on brain hemisphericity.

complexity science: e.g., Mandelbrot 1977, Bar-Yam 1997, Schroeder 1990, Peitgen, Jürgens, and Saupe, 1992) As discussed in Chapter 6, self-similarity also includes the idea of *scale invariance*, where the parts of a whole at one scale are proportionally very close to what they are at other scales of that pattern (e.g., Schroeder 1990, 390).

A second primary parallel tenet is *sensitivity to initial conditions*. The *Great Learning* or *Dà Xué* (大學) talks about knowing the tree from its root, and about how there has never been something that was good but that had neglected roots. The *Yi Jing* (易經) is also sensitive to initial conditions—the lines in the makeup of the hexagrams depend upon the lines that preceded them until six lines are present and a complete hexagram is formed. But wait—that hexagram itself can change, if changing lines are present. Table 1 lists a few examples of the parallel tenets I have identified so far. As this is an initial and incomplete exploration into these ideas, I look forward to future scholars identifying many more.

Table 1
Some Parallels between Chinese Philosophy and Complexity Science

Chinese philosophy	Complexity science
<i>Great Learning</i> or <i>Dà Xué</i> (大學)	self-similarity fractal geometry sensitivity to initial conditions fractal self (psychology)
<i>Dao De Jing</i> (道德經), Chapters 43	Coastline paradox
<i>Dao De Jing</i> (道德經), Chapter 54	self-similarity
<i>Yi Jing: Classic of Changes</i> (易經)	bifurcation: attractors

Chinese philosophy	Complexity science
	period 3 phenomena
Principle/pattern <i>Lǐ</i> : (理)	Fractal geometry, <i>organic</i> pattern frozen turbulence in Jade, wood, muscle
Investigate/pattern <i>Gè</i> : (格)	scientific method, context
Thing/being <i>Wù</i> : (物)	fractal geometry of nature/ fractal self
Ritual <i>Lǐ</i> : (禮)	complex adaptive systems
Natural pattern <i>Xìng Lǐ</i> : (性理)	fractal geometry of nature/fractal self

Note: Author's table.

Explanation of Terms in Table 1

Because the focus of my degree is primarily upon Chinese philosophy rather than complexity science, I use the examples of texts and terms of Chinese philosophy for comparison to complexity science terms. Each of the texts and terms of Chinese philosophy in the left column of the table are explored through one or more terms of complexity science in the right column of the table. Explanations of complexity science terms in the table are listed in the complexity science glossary.

In ways that Terry Marks-Tarlow (2012) goes into in Chapter 6, I use left and right hemispheric sensibilities for the main headings.¹⁴⁶ The terms and texts of much of organismic Chinese philosophy¹⁴⁷ can be loosely compared to right-

¹⁴⁶ See Appendix A for further discussion of brain hemisphericity.

¹⁴⁷ The exception is the left-hemisphere focus of Legalism in Chinese philosophy.

hemisphere metaphoric awareness and terms of complexity science can be loosely compared with left-hemisphere focused, explicit attending.¹⁴⁸

Great Learning (Dà Xué 大學)

The *Great Learning (Dà Xué 大學)* is one of the texts focused upon in this project. I use the text as translated by James Legge (1893) as excerpted below, to show a number of parallel features found in complexity science.

Self similarity.

4. The ancients who wished to illustrate illustrious virtue throughout the kingdom, first ordered well their own states. Wishing to order well their states, they first regulated their families. Wishing to regulate their families, they first cultivated their persons. Wishing to cultivate their persons, they first rectified their hearts. Wishing to rectify their hearts, they first sought to be sincere in their thoughts. Wishing to be sincere in their thoughts, they first extended to the utmost their knowledge. Such extension of knowledge lay in the investigation of things. 5. Things being investigated, knowledge became complete. Their knowledge being complete, their thoughts were sincere. Their thoughts being sincere, their hearts were then rectified. Their hearts being rectified, their persons were cultivated. Their persons being cultivated, their families were regulated. Their families being regulated, their states were rightly governed. Their states being rightly governed, the whole kingdom was made tranquil and happy. (357–59)

A “nested” quality can be seen in lines 4 and 5 (above) that is present in a number of Chinese texts (e.g., Y. Wu 1989, 195). As a truncated example of this structure, if “condition A” is to be met, “condition B” must be fulfilled. If “condition B” is to be met, “condition C” must be fulfilled. When “condition C” is fulfilled, “condition B” is met. When “condition B” is fulfilled, this completes “condition A.” When “condition A” is fulfilled, then the nested structure is complete.

¹⁴⁸ Please see Appendix A on brain-hemisphericity for qualifications and exceptions to this statement.

Fractal geometry.

In lines 2 and 3 of Legge's (1893) text as excerpted below, a self-similar nested quality ends in the reference to a tree (tree, shown by being underlined in the passage) which is a fractal. As shown in the complexity science glossary, trees have a fractal dimension.

2. The point where to rest being known, the object of pursuit is then determined; and, that being determined, a calm unperturbedness may be attained to. To that calmness there will succeed a tranquil repose. In that repose there may be careful deliberation, and that deliberation will be followed by the attainment of the desired end. 3. Things have their root and their branches. Affairs have their end and their beginning. To know what is first and what is last will lead near to what is taught in the Great Learning. (356–57)

Sensitivity to initial conditions.

Sensitivity to initial conditions is shown in lines 6 and 7 of Legge's text as excerpted below. Here the initial conditions are referred to as "the root," which cannot be neglected, if "what should spring from it be well ordered" (Legge 1893, 359). An additional exhortation is declared about what occurs when "slight care" is afforded to something, that then that something would *not* have "great importance," as different from that which receives "great care." (Legge 1893, 359)

6. From the Son of Heaven down to the mass of the people, all must consider the cultivation of the person the root of everything besides. 7. It cannot be, when the root is neglected, that what should spring from it will be well ordered. It never has been the case that what was of great importance has been slightly cared for, and, at the same time, that what was of slight importance has been greatly cared for. (Legge 1893, 359)

Fractal Self (Psychology)

As covered in Chapter 4, when one experiences oneself as a whole being, one becomes a part of self-similar nested structures which the *Great Learning* (Dà

Xué 大學) illustrates. To quote Terry Marks-Tarlow (1999) regarding an individual's introduction to their fractal psychological space, "The more you look [into the self]," she says, "the more [detail] there is to see" (339).

Dào Dé Jīng (道德經), Chapter 43: Coastline paradox.

The second line of Chapter 43 of the *Dào De Jīng* (道德經) states: "Only that which has no existence can enter that which has no crevice" (Y. Wu 1989, 158). In an endnote at the end of this line, Dr. Y. Wu (1989, 159) says "No existence' indicates being without matter, like the air can go everywhere without obstruction."

This is an example of the coastline paradox, which states that the shorter the unit of measurement, the longer becomes that which is measured, until when the unit of measurement reaches zero, that which is measured becomes infinite. (e.g., Mandelbrot 1977, Marks-Tarlow 2008b, 240). When measurement reaches zero, it has "no existence," and yet can then "go everywhere [throughout infinity] without obstruction."¹⁴⁹

Dào De Jīng (道德經), Chapter 54: Self-similarity.

As discussed in the *Great Learning* (*Dà Xué* 大學), Chapter 54 of the *Dào De Jīng* (道德經) shows a nested structure.

¹⁴⁹ See page 125 for an additional description of the "coastline paradox."

Yi Jīng (易經)

An exhaustive explanation of how the *Yi Jīng* (易經) is an example of a dynamical complex system is beyond the scope of this project. Extended explorations of the *Yi Jīng* (易經) as a non-linear dynamical system are available in Walter 1994, 1995; McKenna and McKenna 1994, and Wright 2008.

The *Yi Jīng* (易經) was originally developed by the legendary Fu Xi in early antiquity. Fu Xi developed the eight trigrams of solid and broken lines as archetypes of transcendent and natural phenomena.¹⁵⁰ King Wen combined the eight trigrams into sixty-four hexagrams with a total of 384 lines and wrote original commentaries on the hexagrams. King Wen's son, the Duke of Zhou wrote the commentaries on the individual lines. Confucius wrote the appendix to the *Yi Jīng* (易經) known as the "Ten Wings," which brought the *Yi Jīng* (易經) into the domain of a philosophical text that undergirds all of Chinese philosophy (Y. Wu 2007a, 2007b, 2009c).

The *Yi Jīng* (易經) was originally developed as a divinatory practice. A practitioner would hold a question in mind about a complex life situation, and in the earliest divinatory practices place a tortoise shell into a fire. The cracks in the shell were read as answers to the diviner's questions. Later methods of separating fifty yarrow or milfoil stalks, or the casting of three coins to build the six lines of

¹⁵⁰ See Chapter 1, Figure 3.

the hexagrams were developed.¹⁵¹ When consulting the *Yi Jing* (易經) about a complex life situation, the *Yi Jing* (易經) serves to show the hidden order in the complex situation by resonance¹⁵² with the complex situation, in building the six line hexagram indicating an archetype of the complex life situation (Y. Wu 2007a, 2007b, 2009c).

In any life process, decisions and choices are made when complex circumstances present themselves for one's consideration. A choice is made, and the resulting circumstances from the choice are possibly quite different if a different choice had been made at a particular decision point. One of the key points in the practice of meaningful divination is that the practitioner should take some time to contemplate and formulate a thoughtful and relevant question, where one has a less-than-certain idea of the choices available at a particular decision point. In divination a process of making choices applies, yet the diviner is seeming to make such choices "at random" of the stalks, coins, or tokens. The choices the practitioner makes then result in the figure of a hexagram, that may offer the practitioner a deepened insight into their question.

¹⁵¹ These methods are referred to as "casting" a hexagram, while holding a question in mind. While the actual physical exercise of casting a hexagram is quite straightforward, the specific explanation of practicing each of these methods is explicitly described in numerous pages of each of the references following the specific method, and is beyond the scope of this book. The method for casting a hexagram using yarrow or milfoil stalks takes about 20 minutes. The coin method takes about 5 minutes. (See Wilhelm and Baynes 1967, 721–24 for yarrow-stalk and coin methods of consulting the *Yi Jing* (易經). Recently a method using sixteen colored tokens has been developed, where the probabilities of the yarrow stalk or milfoil method are reproduced, with the speed of the coin method (see Walter 1994, 257–62).

¹⁵² See Chapter 7 on resonance.

The following complexity science terms are considered in the divining process of and philosophy of the *Yi Jīng* (易經). Interesting parallels between the philosophy of the *Yi Jīng* (易經) and complexity science are discussed; each serving to illuminate the other.

Attractors.

A simple attractor is called a “point” attractor (e.g., Schroeder 1990, 40). An example of a point attractor is a marble placed in a shallow bowl or dish. Even if the marble is given a fairly high degree of motion when placed in the dish, where it circles at the outer edges of the bowl, the marble will eventually lose energy and end up at rest in the center of the bowl. If the marble is given additional energy, it will circulate and again end up at the center of the bowl. Another example is a pendulum. The pendulum will reach a rest state. An example of a point attractor in a life circumstance would be something that is done consistently on a daily basis; for instance, a person returning home to a significant other after the activity of the day. The attractor in consulting *Yi Jīng* (易經) is the complex life situation to which one is drawn, that gives rise to the question one holds in mind while consulting the *Yi Jīng* (易經).

Bifurcation.

Bifurcation¹⁵³ is when the slowly increasing energy of a system in a stable state of a point attractor reaches a cusp point, and then either moves to a new higher energy state or a new lower energy state. The system does not continue on

¹⁵³ See the bifurcation diagram in the complexity science glossary (Appendix D).

the same trajectory it was before the cusp point. Sometimes these systems can alternate between the high energy state and low energy state (e.g., Schroeder 1990, 117).

Following on the simple example of “loves me, loves me not” in the exploration of potential new love with a significant other, would be a cusp point where one’s love is declared. The hope is for the significant other to respond positively to one’s approach, in which case the energy of the system moves into a higher energy state. Or the hoped for significant other responds negatively, in which case the energy of the system decreases significantly. Before the declaration there is an alternating between two states of hope for love and fear of rejection. The declaration itself is a cusp point where possibilities condense into a less complex state.

The *Yi Jīng* (易經) takes a complex situation and finds the pattern in the complexity by reverse bifurcation. An example of reverse bifurcation in the consulting of the *Yi Jīng* (易經) is that one holds a question in mind regarding a complex situation and performs an observation through the repeated divisions of yarrow or milfoil stalks, casting of coins, or drawing of tokens to get a simplified result of the complex situation. Thus the question which represents the complexity of the system becomes simplified by these reverse bifurcations or choices, finally in terms of an archetypal six-line hexagram.

Period doubling.

Period doubling refers to an attractor of a system that has a single stable state or period, that when perturbed with additional energy bifurcates into two

distinctly stable states or periods. This would be a system which, with the addition of energy, alternated between a state or period of one of two levels. When further perturbed with additional energy, the system bifurcates again, from two to four distinctly stable states or periods. This is period doubling, with the further addition of energy, consistently alternated between one of now four states or periods of different levels. This doubling of states can continue from 2, 4, 8, 16, 32, and more discrete states or periods, with the addition of energy (e.g., Schroeder 1990, 279). One can see that things get very complex very quickly.

A simple intuitive example of period doubling, as in the example above, is the human ambivalence with increased emotional involvement with meeting a newly significant other who has not confirmed or denied interest, in the “she/he loves me, she/he loves me not” scenario. Before the meeting, one is in a stable state of being alone. Upon meeting a potential new partner (prior to any declaration of interest or intent), one is hopeful and yet unsure of the feelings of the newly significant other, and therefore swings between the “loves me, loves me not” poles. With additional energy the system gets very complex—as in “will they love me or not if I do X or Y, or *don't* do X or Y?” And then what if, and then what if...How are we to simplify the emotional possibilities and probabilities that have quickly become so complex?

With the *Yi Jing* (易經), in divinatory practice, every time a choice is made with yarrow stalks, coins, or tokens, the multiples of possibilities of a situation are condensed into less complex states, in the way a coin flip condenses probabilities into a single observation of heads or tails. In the case of the single

flip of a coin, there is only a single answer—heads or tails. In the case of the *Yi Jīng* (易經), there are four possibilities with each set of observations or decisions that build each of the six lines of the hexagram (old yin, old yang, new yin, new yang) that then build sixty-four hexagrams, for a total of 384 possible lines. Each line of each hexagram has an associated interpretation within one of the sixty-four hexagrams.

The example of loves me/loves me not has two poles: either—or. Obviously an emotional involvement between two people is much more complex than a yes or no. The *Yi Jīng* (易經) is able to illuminate much greater nuance in illuminating the structures of a complex system through its sixty-four hexagrams and 384 lines than the simple yes/no of a coin flip. Alan Watts (Jacobs 1973) once compared the *Yi Jīng* (易經) to a 64-sided coin.

Period 3 phenomena.

This term¹⁵⁴ refers to an attractor that has bifurcated into two stable states or periods, that when perturbed with additional energy usually bifurcates again to four distinct states or periods. Sometimes with the addition of energy systems do not always double, as one pole of a doubled period or state remains stable and the other pole of the period or state doubles. Then there are *three* discreet states or periods of stability in the system (e.g., Schroeder 1990, 279, 291).

¹⁵⁴ See complexity science glossary for a more complete description of period 3 phenomena.

Gleick (1987) reports that with additional input of energy sometimes states will take on additional doubling in becoming stable at 4, 8, and 16 states. With further increased energy these states then become unstable or chaotic for a time, only to settle into stable states that cycle in odd periods such as 3 or 7. With increased energy the odd-period states of the system then devolve and cascade into chaos again (Gleick 1987, 73).

With its doubled tri-grams the *Yi Jīng* (易經) is a period 3 phenomena. As a period 3 phenomena the *Yi Jīng* (易經) is capable of embracing and condensing the nested infinities of complexity and chaotic situations (Walter 1994, 115–19) into sixty-four hexagrams with 384 lines.

Principle/Pattern, Lǐ (理): Organic pattern, fractal geometry.

As shown in Chapter 3, *lǐ* (理) refers to *natural organic pattern*, which has *fractal dimension*. All things *wù* (物) in the cosmos partake of this patterning.

Investigate/Pattern, Gè (格) Investigation, patterns, and context.

As I argue in Chapters 4 and 6, Chinese terms have multiply enfolded meanings, referred to as *paranomasia* (Ames 2008, 37–48). The term *gè* (格) has enfolded within it, according to *context*, the meanings of knowledge, which encompasses the left-hemisphere scientific method (upon which complexity science is based), *and* wisdom, which encompasses right-hemisphere intuition (and is consonant with the metaphors of Chinese philosophy).

Thing/Being, Wù (物: Fractal geometry of nature (10,000 things).

As I argue in the term *lǐ* (理) above, all things (known in Chinese philosophical texts as the 10,000 things, *wù* (物), or the “myriad” things) in the cosmos have fractal patterning. This is shown in the following topics.

Organismic pattern; being/non-being.

F. W. Mote (1971) declares,

The genuine Chinese cosmogony is that of organismic process, meaning that all of the parts of the entire cosmos belong to one organic whole and that they all interact as participants in one spontaneously self-generating life process. (19)

Mandelbrot (1976) has stated nature has fractal dimension (3).

The term *wù* (物) is usually translated as “thing” or “things” in the cosmos. Organic things in nature have fractal dimension. In that people are also a part of the cosmos I argue that the Chinese term *wù* (物) could be further interpreted to mean one’s “body as being.” Dr. Yi Wu talks about “the body as being” in his book *Self and Mind: Integral Life Psychology*, where he speaks of the Taoist idea of “being and non-being” as a kataphatic (or that the body is the cosmos) and apophatic (that there really *is* no separated body) approach (Y. Wu 2012, 48).

This paranomastic reference to *wù* (物) is why I speculate that the sentence *zhì zhī zài gé wù* (致知在格物; Confucius 2013, verse 2) could be translated as “The completion of wisdom lies in the *patterning of being*.”¹⁵⁵ The

¹⁵⁵ See Chapter 7 (translation of key passage of *Chéng Yí* by Zhū Xī).

fractal dimensionality of *wù* (物) could be expanded to include one's *being*, as well as "things." Thus it could be said that one's body and one's *being* has fractal dimension.

Ritual, Lǐ (禮): Complex adaptive systems (CAS).

A complex adaptive system (CAS) is a complex system where "the whole is greater than the sum of its parts" (Guastello, Koopmans, and Pincus 2009, 4). The CAS has the capability to be *adaptive* in its internal and external responses to changes in its environment (Guastello 2009, 405). CAS speak to the adaptive qualities of ritual *lǐ* 禮 that retains vitality and relevance to the time in which ritual is performed.

Ritual (*lǐ* 禮) is seen by many, such as the legalists (e.g., Fung 1973, 36; Chan 1973, 254) as an enforced rigid conformity to rules of conduct. In my reading of Behuniak (2008) on ritual *lǐ* (禮) and looking at the etymology of *lǐ* (禮), (which is essentially someone singing over an offering of food to harmonize [oneself] with the divine that connects [with] the sun, moon, and stars),¹⁵⁶ it seems that *lǐ* (禮) is the developing of conduct designed to harmonize (*hè* 和) oneself (or bring oneself into an appropriate *context*)¹⁵⁷ with the organic patterns (or *lǐ* 理) of the cosmos (Behuniak 2008, 56). Behuniak (2008, 53–55) emphasizes that a kind of *fluidity* to the engagement of ritual (*lǐ* 禮) is more important in

¹⁵⁶ See glossary of Chinese terms (Appendix B) for *lǐ* (禮).

¹⁵⁷ See epilog for description of harmony or *hè* (和) as "context."

actually harmonizing (*hè* 和) with the cosmos, than is the actual *form* of the ritual. This fluidity in the engagement of ritual (*lǐ* 禮) preserves the original intention of harmonizing (*hè* 和) with the cosmos—far more than adherence to a static and dogmatic form that is no longer in harmony (*hè* 和) with the cosmos in keeping with the spirit of ongoing change (*yì* 易). As a part of a healthy CAS, effective ritual (*lǐ* 禮) *adapts* to the conditions of the time in which it is performed.

Natural Pattern, Xing Li (性理): Fractal geometry of nature, patterns in jade, wood, muscle.

The fractal geometry of nature is discussed in Chapter 5. A discourse on the fractal nature of the self is presented in Chapter 6

Chaos, Hùn Dùn (混沌)

In the prologue to their introductory and popular book on complexity science, *The Turbulent Mirror*, physicists John Briggs and F. David Peat (1989, 19) quote the Burton Watson (1968) translation of Taoist Zhuangzi:

The emperor of the South Sea was called Shū [儻][Brief], the emperor of the North Sea was called Hū (忽)(Sudden), and the emperor of the central region was called Hùn-dùn [混沌][Chaos]. Shū and Hū from time to time came together for a meeting in the territory of Hùn-dùn, and Hùn-dùn treated them very generously. Shū and Hū discussed how they could repay his kindness. “All men,” they said, “have seven openings [qiào 竅] so they can see, hear, eat, and breathe. But Hùn-dùn alone doesn’t have any. Let’s try boring him some!”

Every day they bored another hole, and on the seventh day Hùn-dùn died (Watson 1968, 97).

This quote shows Zhuangzi’s playfulness, and beyond that, tacitly offers an implication that the more left-hemisphere based one becomes, or the more one becomes drawn what one thinks one knows from any of the senses, the less

susceptible to right-hemisphere spontaneous and contextual un-sense-filtered experience with the unpredictable and chaotic nature of reality one becomes. This is very much like the “Heart Sutra,” where each of the senses and all being is declared “empty”(Conze 1958, 79).

Prior to the development of complexity science in the West, chaos has had a negative connotation. The *OED* defines chaos as follows:

A gaping void, yawning gulf, chasm, or abyss; a state resembling that of primitive chaos; utter confusion and disorder; “Anything where the parts are undistinguished” (Johnson); a confused mass or mixture, a conglomeration of parts or elements without order or connection....The “formless void” of primordial matter, the “great deep” or “abyss” out of which the cosmos or order of the universe was evolved. (*OED* 2013c)

One of the ways this “order of the universe” that “evolves” (iterates) from chaos is through self organization.¹⁵⁸ Another way order can be attempted is through thought and *observation*. Observation must occur through one’s *senses*, or “openings (*qiào* 竅)” as Zhuangzi put it. (Watson 1968, 97). Perhaps Zhuangzi was speaking of when what *was* chaotic is finally precisely pinned-down (by known sensory discrimination, sharp focus, and loss of spontaneity), it dies, as it then ceases to be chaos.

In becoming immersed in an overly precise, non-spontaneous ordered mode of thinking, a vitality of awareness is lost, as in complete linear order there is a limit to what can be “known.” When people allow themselves to shift their personal metaphysics and *also* attend to natural organic patterns from a non-cognitive and holistic perspective, the conceptual paradoxes of chaos and

¹⁵⁸ Stuart Kauffman (1995, 71–92) calls self-organization “order for free.”

complexity remain vital.¹⁵⁹ To return to these ideas of wisdom and knowledge, perhaps it is wise to allow one's small self to dwell in "not-knowing," for it is in not-knowing that vitality is continually present.

Future Research

This chapter shows examples of a selected few of the parallels between Chinese philosophy and complexity science shown in Table 1. Through continued study of these topics, by their very nature, the wisdom that is within them and us will continue to unfold. New insights will continue to "bubble up" from beneath or outside of our limited conceptual awareness. Yet with a deepening volitional involvement in contextualized, wholistic, holographic being, one can fulfill one's *tiān ming* (天命); one's "heaven's destiny."

¹⁵⁹ See Chapter 6 and an explanation of Marks-Tarlow's (2012, 225) "Non-overlapping realms of understanding."

Chapter 6: The Completion of Wisdom through Plumbing Pattern

In this chapter I consider the meanings of a number of terms and possible translations of Chinese words and texts, and the paranomasic or multilayered quality of Chinese terms (Ames 2008, 37–48). I compare these considerations of meaning with translations of terms and texts of translators of Chinese whose English translations seem to be from a philosophically presuppositional basis of left-hemisphere linear precision and focus.¹⁶⁰

It is beyond the scope of this book to speak in any depth about translation theory. I wish to acknowledge the difficulty of translating and responsibly communicating meaning from one language to another. Not only do writing systems differ, but attempting to bridge significant historical, cultural, and geographical gaps of meaning is a formidable task. Different translators will bring different cultural orientations and values systems to the translation of same texts as other translators. I think all translators, myself included, bring unconscious, implicit presuppositions and impositions of values on texts they translate.

In my work as a responsible translator, I have not simply accepted conventional translations of others in a wholesale manner. I have sought to look at the arguments that support specific choices of particular translations, and to offer my own choices and arguments to support those choices. I seek to be as transparent as possible, and seek only to *add* possibilities of meaning and interpretation, rather than ever displace (even if I disagree) the meanings and

¹⁶⁰ See Appendix A on brain hemisphericity and associated characteristics.

interpretations suggested by previous translators. The only feature of translation I actively seek to displace is that of an explicit or implicit insistence by some translators of an exclusivity of meaning and interpretation of specific terms and ideas.

In these discussions, it is key to understand the paranomasic character of Chinese terms discussed in Chapter 3 within the section on paranomasia. To summarize, Chinese terms have a multiply layered nature; they have the characteristics of a vessel of sorts. Moreover, each can be a tiny portal into a cloud of contextual meanings (Ames in Jones 2008, 37–48).

The layers of meaning appear self-similar, and lead to a holographic interface with meaning that contrasts markedly with translations of terms and texts of translators of Chinese whose English translations seem to be from a philosophical and presuppositional basis of left-hemisphere linear precision and focus of meaning (e.g., Legge 1893, 1895, 1899). One of my theses in this book is that translations of Chinese terms into English, with left-hemisphere philosophical presuppositions of precision, linearity, and sharp focus, engenders the loss of the contextual richness and multiple dimensions of meanings implicitly enfolded in Chinese terms. This results in arriving at a more or less monochrome of meaning in comparison to the polysemy of the actual Chinese terms. In other words, where left-hemispheric philosophical presuppositions are rather more attendant to the

precision, focus, specificity and logic, Chinese philosophy is more organismic¹⁶¹ in character (Mote 1971, 17–19) and is more resonant¹⁶² with the nonlinear, contextual associative qualities of the right-hemisphere (McGilchrist 2009, J. Taylor 2008).¹⁶³

Analysis of Terms and Texts

The title of this book is *Zhì zhì qióng lǐ* (致知窮理), or *The Extension of Knowledge through Plumbing Principle*. I suggest that additional and deepened meaning may be found by an alternate translation of this phrase as “The Completion of Wisdom through *Inhabiting* Pattern.” I first consider the terms of the previous sentence one at a time, and then discuss the entire phrase.

As the phrase “extension of knowledge” is the pivotal phrase at the core of the *Great Learning*, and has a significant position in the literature and meanings of the first of the four books, it is useful to consider this phrase through additional analysis. The pedigree of this phrase is found through Zhū Xī and the “Four Books” (e.g., de Bary, Bloom, and Lufrano 1999–2000, 668, 721; Hon 2003, 135; Gardner 1986, 3–4, 13, 15; 2003, 49, 153, 171, 176; 2007).

¹⁶¹ Mote (1971, 19):

The genuine Chinese cosmogony is that of organismic process, meaning that all the parts of the entire cosmos belong to one organic whole and that they all interact as participants in one spontaneously self-generating life process.”

¹⁶² See Chapter 7 for discussion on resonance.

¹⁶³ See Terry Marks-Tarlow’s (2012) discussion of the right hemisphere in Chapter 6.

Completion Versus Extension: Zhì (致)

First, I translate the character *zhì* (致) as “completion” rather than “extension.” To extend something is to develop or to reach across to something new. In completion, on the other hand, there is the idea of an already-existent structure that only needs a few components for it to be completed or fulfilled; nothing new needs to be developed¹⁶⁴ or added. Zhū Xī, in the *Doctrine of the Mean* (or *Zhōng Yōng* 中庸), suggests the idea of discovery, or the uncovering of the innately good nature of human beings (Gardner 2007, 65, 123–25). The inherent basis of humanity may become covered over with mistaken ideas and beliefs, as Zhū Xī suggested in his study of evil. To uncover this inherent basis of goodness (and wisdom) is to complete it (Gardner 1990, 51, 55–56, 183; 2003, 142; Chan 1967, 6, 19, 202; 1973, 599).

Wisdom Versus Knowledge: (知)

I translate the character *zhì* (知) as “wisdom,” rather than “knowledge.” I have already begun the discussion of the differences between knowledge and wisdom in Chapter 1. *Knowledge* is fairly consistently understood to mean the developing of a linear and sequential understanding—of data that is compiled in a left-hemisphere, sharply focused, precise, and explicit way, which by its very nature is limited. Wisdom is a different sort of awareness altogether. Where sharp focus and precision in attention may certainly serve to enrich understanding,

¹⁶⁴ Other than perhaps by psychological development in fulfilling one’s *inherent* (fractal) *potential* in a process of growing up, maturing, and flowering.

wisdom is a significantly more holistic state (Marks-Tarlow 2008b, 278; 2012, 215–49) and is inclusive of states of awareness that are much earlier in the developmental phase of human beings (J. Taylor, 2008). In this section, I discuss the differences between *wisdom* and *knowledge* from both Western and Eastern sources.

Wisdom and Knowledge in Western Culture and Philosophy

In this section, I talk about the left-hemisphere, sharply focused, and manipulative, philosophical nature of Western culture; which presuppositionally limits Western culture, largely, to a linear mode of thinking, particularly where the terms “wisdom” and “knowledge” are concerned. To restate; the *OED* (*OED* 2013i, def. 1a, 1c, 2a, 4) defines *wisdom* as a “capacity to judge rightly...one of the manifestations of divine nature...knowledge...sanity (or) reason.” The *OED Online* (2013e, def. 3a, 4a–b) describes *knowledge* as

the fact or condition of knowing something...the faculty of understanding or knowing; intelligence, intellect...the apprehension of fact or truth with the mind; clear and certain perception of fact or truth; the state or condition of knowing fact or truth.

The following six-component Western overview of “wisdom” in the psychiatric and neurological sense is offered as an example of the Western linear mode of precise thinking in the literature review *Neurobiology of Wisdom* (Meeks and Jeste, 2009, 356). Though this overview is deconstructive in nature, the authors admit,

Although there is no consensual definition of wisdom, we believe that wisdom is a unique psychological construct, not just a collection of desirable traits with a convenient unifying label. Wisdom may be viewed as a trait comprising of several subcomponents...By examining the more consistently identified subcomponents of wisdom, one can begin to

hypothesize how such a complex human characteristic may be orchestrated within the brain. (361)

Being that Meeks and Jeste (2009) are Western psychiatrists, it is not surprising that these allopathic physicians restrict their focus on the activity of the brain, and upon the actions of a separated individual within which that brain is located. They present the following table of components of wisdom (Table 2).

Table 2
Components of Wisdom

Components	Examples
Prosocial attitudes and behaviors	<p>“Achievement of a common [social] good”</p> <p>“Implicit idea that wisdom serves a common good”</p> <p>Factor analysis yielded “altruism” as dimension of wisdom</p> <p>Affective wisdom includes “positive emotion and behaviors toward others”</p> <p>One of five dimensions of wisdom is warmth</p>
Social decision making/pragmatic knowledge of life	<p>Two basic criteria (1) rich factual knowledge regarding human nature and life course and (2) rich procedural knowledge regarding ways of dealing with life’s problems</p> <p>The tacit nature of knowledge implies more than knowing when, where, how and why to apply knowledge</p> <p>“Practical knowledge” as a dimension of wisdom</p> <p>Practical wisdom is “good interpersonal skills and understanding, expeditious use of information, and expertise in advice giving”</p> <p>Three dimensions of wisdom include judgement, life knowledge, and life skills</p>
Emotional homeostasis	<p>Emotional stability despite uncertainty as a component</p> <p>Affective wisdom includes “absence of indifferent or negative emotions toward others, and remaining positive in the face of adversity”</p>

Components	Examples
Reflection/self-understanding	<p>One dimension of wisdom” emotional management</p> <p>Reflective abilities are a key component of wisdom</p> <p>Reflective judgment an important part of wisdom</p> <p>Transcendental wisdom comprises interest in self-understanding</p> <p>Reflective wisdom is 1 of 3 key dimensions of overall wisdom</p> <p>Self-knowledge identified as a dimension of wisdom</p>
Value relativism/tolerance	<p>Value relativism and tolerance 1 of 3 meta-criteria for wisdom</p> <p>Value relativism seen as a component of wisdom</p> <p>As part of reflective wisdom: “ability and willingness to examine phenomena from multiple perspectives; absence of projections”</p> <p>“Tolerant and understanding” part of descriptors of Practical Wisdom Scale</p>
Acknowledgement of and dealing effectively with uncertainty and ambiguity	<p>“Handling of uncertainty, including the limits of knowledge”</p> <p>Comprehension of/dealing with uncertainty</p> <p>“3 key components: (1) Meta-cognition (acknowledging uncertainty and ability for dialectical thinking); (2) Personality/affect (emotional stability despite uncertainty and openness to new experience); (3) Behavior (ability to act in the face of uncertainty)</p> <p>“Cognitive wisdom includes awareness of life’s inherent uncertainty yet ability to make decisions in spite of this.</p>

Note: Adapted from Meeks and Jeste (2009, 356).

These six components of wisdom are drawn primarily from left-hemisphere modalities (Marks-Tarlow 2012, 163–64).

In their table, Meeks and Jeste (2009, 361) frequently reference Monika Ardelt, a sociologist and University of Florida researcher on aging; her writings on wisdom further illustrate common Western perspectives. Ardelt (2003) acknowledges, in her struggle to define wisdom, that

a generally agreed upon definition of wisdom does not exist. However there is a consensus that wisdom is a multifaceted and multidimensional concept and that the multiple facets and dimensions reinforce each other. The multifaceted nature of wisdom tends to evoke different connotations depending on the philosophical and theoretical orientation of the researcher....Wisdom is defined as an integration of cognitive, reflective, and affective dimensions. (277)

Ardelt further struggles to assign wisdom to “personality”; as if somehow wisdom would only be available from and found within individuals.

Defined in this way, wisdom is considered a personality characteristic rather than a performance-based characteristic....Although wisdom per se might be relatively difficult to find, it should still be possible to assess how close people come to this ideal state. (279)

Ardelt is not unaware of differences between Western and Eastern understandings of wisdom, but even in her discussion of those differences, she remains left-hemisphere oriented.

Explicit theories of wisdom might differ for the philosophical wisdom traditions of Western and Eastern cultures. The wisdom traditions of the West tend to emphasize the cognitive dimension of wisdom (i.e., knowledge and analytical ability), whereas the Eastern wisdom traditions tend to integrate the cognitive, reflective, and affective elements of wisdom....Following the Western wisdom traditions, [wisdom is defined as] “an *expert knowledge system*.” (emphasis mine; Ardelt 2003, 283)

Ardelt (2003) admits here that the Western idea of wisdom is primarily cognitive [Ardelt’s language], but the only grant of a noncognitive status of wisdom in Eastern cultures is presupposed to be a component of personality—as an “affective” component of a separated individual, who is an “expert,” in a “system

of knowledge.” There is no place here for the individual as a noncognitively transparent participant in the organic pattern of the cosmos.

So, in a Western mode, wisdom and knowledge are conflated as a primarily cognitive [Ardelt’s language] or affective mode of individuals, separated from the world they in which they live. Unconsciously betrayed by Western language in her assessment of Eastern wisdom, unconscious of her presuppositional biases, sociologist Ardelt (2003) is unaware of the philosophical presuppositions of Chinese philosophy of the cosmos as organismic and holographic.

While human beings may be seen to act as separate individuals in Western philosophical traditions *upon* the world, in all schools of Chinese philosophy,¹⁶⁵ human beings interact as inseparable parts *with* and *of* the organic pattern of the cosmos. (Tu and Tucker 2003, 39–43; Mote 1971, 19). In the Chinese philosophical elements emphasized in this book, wisdom is a “way of life” (Yao 2006, 56). Yao (2006, 87) states,

in the communal respect, wisdom becomes a particular way of life through dealing with a variety of interpersonal relationships....a way of dynamic living...to run a successful course of personal life.

The ultimate development of wisdom in a Confucian context is to become a “sage.” According to Zhū Xī, because everyone is born with the same lǐ 理 (organic pattern/principle), everyone has the capability to become a sage (Gardner

¹⁶⁵ Even in the implementation of the laws of the Legalist school of Chinese philosophy, the *dào* (道) is still held as the organismic basis of the school and of the cosmos.

1990, 49), and thus come to act in harmony with the organic pattern of the cosmos of which they are a part.

As a Westerner who has discovered his own right-hemisphere, holographic understanding of wisdom, Harvard neurosurgeon Allan Hamilton, MD, FACS suggests that wisdom may have a holographic nature, extending far beyond the brain of an individual.

In the final analysis, superstitions, omens and intuitions are the reflections of a conscious effort on the part of an individual to detect the subtle signals sent to us from the natural world. If we are convinced that the life and the matter around us are mute, then we are confined to the silence of the scientifically correct. If we are open to subtlety, then the world resonates with significance. (Hamilton 2008, 28)

Dr. Hamilton expressed to me his amazement at the intuitive capacities of native people to assess situations in daily life that were beyond the scope of normal Western logic, and attend to the world in an intuitive holographic way to time *and* space. (Hamilton 2008, 23).

Building a Bridge: Psychological Knowledge, Intuition, and Wisdom in the Work of Terry Marks-Tarlow

Western psychologist Terry Marks-Tarlow is a pioneer in bridging Western understanding with certain more right-hemisphere, Eastern worldviews. She makes an important distinction between knowledge and wisdom in her book *Clinical Intuition in Psychotherapy* (Marks-Tarlow 2012), though there is still a separation of self, other, and the cosmos, as here there is only a reference to self-care, and care of others.

I assert that wisdom in the clinical domain is two-fold. One dimension relates to excellence in self-care, and the other to excellent self-care of others. The true action lies in the balance and interplay between these two. (Marks-Tarlow 2012, 217)

Clinical psychologist Terry Marks-Tarlow restricts her comments to her field of practice (psychotherapy) in making the distinction between knowledge, intuition, and wisdom. She suggests philosophy is a domain where these distinctions are clear:

Whereas *knowledge* represents the accumulation and application of facts about our field *in theory*, *intuition* represents the accumulation and application of knowledge and expertise *in context*. Whereas *intuition* applies knowledge within the living framework of a real relationship with a real person in a particular moment, *wisdom* represents the capacity to use the *widest and deepest context* when making moment-to-moment assessments, decisions, responses, and interventions. (Marks-Tarlow 2012, 217–19)

She closes this discussion with the statement, “Philosophy is the one place where these distinctions are readily discernable” (Marks-Tarlow 2012, 219), which is notable in that “Western” (referring to Western philosophy) is assumed. Such unconscious elements reflect the difficulty of rising out of Western metaphysical presuppositions.

Marks-Tarlow’s (2012) distinctions between knowledge, intuition, and wisdom are much more clearly stated than Meeks and Jeste (2009), and Ardel (2003), and her introduction of intuition as a bridge between knowledge and wisdom is salient and to the point regarding applying knowledge in the context of interacting with an individual. In Chapter 7, I return to some of Marks-Tarlow’s comments about context, which I consider highly relevant to the discussion of wisdom and organic pattern.

Marks-Tarlow (2012, 219) continues her discussion of the distinction between wisdom and knowledge by focusing on “*not having to know that which cannot yet be known,*” using warrior imagery as an example. She begins with her

experience of the work of Alan Watts (1951) and his preface to his book *The Wisdom of Insecurity*,

written in the spirit of Chinese sage, Lao-Tzu: “To know truth, one must get rid of knowledge, and nothing is more powerful and creative than emptiness—from which men shrink.” (A. Watts as quoted in Marks-Tarlow 2012, 219)

This quote reflects the Taoist idea of wisdom: getting rid of knowledge (though knowledge is emphasized in Confucianism, Confucius is essentially a Taoist; see Chapter 6: Wisdom in Chinese Philosophy.

Marks-Tarlow (2012) continues to describe the *warrior stance*, which is about being comfortable with what cannot be known. The warrior stance involves playing the edges of experience in a similar way to Jones (1998, 401), where new possibilities emerge at the experiential edges of stability and chaos, and where tranquility in the moment is most important. To be able to act spontaneously, in this not-knowing space,

A warrior may train long and hard ahead of time, only to stand in inner quiet and outer stillness in the heat of the moment, in order to remain alert and ready for whatever may come. (Marks-Tarlow 2012, 219)

Marks-Tarlow (2012, 219) extends this idea to her work as a psychotherapist.

During psychotherapy this means *not having to know that which cannot be known...*(which) allows us to remain emotionally open, cognitively poised, and spiritually strong enough to withstand the heat of intense emotion, confusion, even delusion...(and) permits encounters *at the edges* of the window of affect tolerance...*without having to know* what will happen next.

Later, Marks-Tarlow (2012, 223–25) considers which Western disciplines might be helpful in bringing this understanding to clinical practice: “The branches of nonlinear science that are relevant to clinical practice include chaos theory,

fuzzy logic, complexity theory, and fractal geometry.” She explains her reasoning in reaching for nonlinear sciences as follows.

Ancient Chinese wisdom and non-linear science share the common features of embracing ambiguity and paradox in their understanding of the universe and its creative origins....When the highest wisdom strikes a universal chord, then the implicit knowledge of ancient peoples sometimes is borne out by later scientific proof. This occurred with chaos theory, where the wisdom of the warrior (i.e., the wisdom of insecurity [Watts 1951]) presaged limits to predictability and control discovered within highly nonlinear systems (e.g., Gleick 1987). (Marks-Tarlow 2012, 219–21)

Here, she concludes, as I have, that chaos theory is a Western avenue back to the understandings present in ancient Chinese philosophy.

Marks-Tarlow (2012) then turns to Western and Eastern creation myths to continue her investigation of the distinctions between knowledge and wisdom.

The prototypical Western myth displays black-and-white thinking. The brave knight kills the scary dragon. Good overcomes evil. Order vanquishes chaos. The story is simple and straightforward. Chaos must be eliminated in order for civilized society to begin to advance (Hayles 1990). Strict dichotomies set the stage for left-brain, reason-based thinking, including modern scientific investigation as grounded in Aristotelian logic (true or false)...

By contrast, Eastern and traditional creation myths highlight dynamic, swirling, ambiguous zones in between the black and white. In these myths, chaos and order are interdependent and interpenetrating. The prototypical Chinese dragon may be scary and intimidating, but shades of gray are revealed by the dragon that ultimately cooperates to enrich humankind. (223)

Marks-Tarlow concludes that the best understanding is found using both cosmologies.

The myths of the East compliment those of the West by giving rise to nonoverlapping realms of understanding....It is useful to contrast two modes of knowing: a linear realm available through left-brain deliberation and a nonlinear realm available through right-brain intuition. (225)

She identifies five characteristics of Western/left-hemisphere attending and their counterparts in Eastern/right-hemisphere attending, as shown in Table 3.

(Marks-Tarlow, 2012, 223.)¹⁶⁶

Table 3
Marks-Tarlow (2012) Left-Right Hemisphere Translation

Western or left-hemisphere understanding	Eastern or right-hemisphere understanding
Linear: lines of thought follow sequential reasoning	Nonlinear: reasoning is <i>cyclic or circular</i> , including polarities that blend or contradict
Abstract: issues are <i>abstracted from context</i>	Concrete: issues are <i>lived in context</i>
Convergent: attention <i>focuses in on details</i>	Divergent: attention <i>broadens out to encompass a wide angle view</i>
Analytic: complex issues are <i>pulled apart logically</i>	Synthetic: understanding emerges from the <i>complex interrelationship</i> among simpler parts
Reductive: wholes are <i>broken down into simpler</i> underlying parts	Holistic: complex understanding arises from <i>how the whole of things informs and forms the parts</i>

Note: Adapted from Marks-Tarlow (2012, 223). Author's table.

Marks-Tarlow's (2012) work offers a beginning bridge for present-day Western grounded scholars with an unconsciously habitual left-hemisphere understanding, in moving toward an Eastern, right-hemisphere understanding.

¹⁶⁶ While Dr. Marks-Tarlow's (2012) five characteristics of hemispheric attending are a simplification of some obviously very complex material, these terms are useful to further correlate a preference of individual modes of relating in given populations (McGilchrist 2009, 10; See Appendix A on brain hemisphericity). These characteristics are not to be taken as any polarized or absolute declaration of any monolithic orientation, because of course there is a richness of counterexamples to either orientation.

However, her need to reach a psychology audience grounds—and limits—her work to the client–practitioner relationship.

Within the clinical domain, I have proposed wisdom as a two-pronged affair. One prong involves the excellent treatment of others....The other prong involves excellent care for the self....Among Tibetan Buddhists there is no distinction between compassion for others and compassion for the self. Because they go hand in hand, there is no separate concept for the two. Wisdom suggests that the capacity to care for and honor the self is absolutely vital to the capacity to care for and honor others. (Marks-Tarlow 2012, 229–30)

While Marks-Tarlow may be correct (from a Western psychological perspective about wisdom) and must address her intended audience regarding care of a separated self and separated others, in her conclusion and definition of wisdom, she bridges the distinction between care for others and care for the self. Marks-Tarlow offers her Western psychology readers the Tibetan Buddhist convention that there is no separate concept for compassion for self and other. This supports the implicit notion within wisdom that there is actually no distinction or separation between self and other.

In the basic organismic presuppositions of Chinese philosophy (Mote 1971, 19; Tu and Tucker 2003, 46), and recapitulated by Zhū Xī (de Bary 1985, 338–39), there is no separated self and other—the patterns inside and the patterns outside are the same. Thus, “completing wisdom” in Chinese philosophy is the dis-covery of unity of oneself with organic patterns of the cosmos.

Wisdom in Chinese Philosophy

Chinese characters for wisdom are *zhī* (知) and *zhì* (智), the first literally means “arrow mouth,” and the second means “arrow mouth sun,” with the addition of the bottom character of [the] sun (*rì* 日).¹⁶⁷

The characters *zhī* (知) and *zhì* (智) are used interchangeably in Chinese. Generally *zhī* (知) can be used as a verb or a noun, but (*zhì*) 智 can only be used as a noun....It is *very* important to distinguish between knowledge and wisdom, both of which are *zhi* (知). (Y.Wu 1986, 66)

In this book, I am retranslating *zhī* (知) as “wisdom,” for the connotations of Chinese philosophy, of organismic cosmology (Mote 1972, 19) and organic pattern (Needham 1956, 558). This definition of “wisdom” is also resonant with Marks-Tarlow’s five characteristics under the heading “Eastern or right hemisphere understanding” (Marks-Tarlow 2012, 223). Dr. Yi Wu also states that where in Confucianism *zhī* (知) can mean both knowledge and wisdom, and “in Taoism, knowledge and wisdom are separated. Taoists value wisdom and renounce knowledge” (Y. Wu 1986, 66).

I believe that Confucius himself was basically a Taoist (as evidenced by Confucius’s “Ten Wings” section of the *Classic of Changes* or *Yi Jing* (易經; e.g., Legge 1963, Wilhelm and Baynes 1967; Y. Wu, 2009c). Conceptual knowledge was not involved so much in the actual realizations that Neo-Confucianist Zhū Xī suggested could occur, that involved abiding in reverence (*ju jing* 居敬) while quiet-sitting (*jing-zuo* 静坐; de Bary and Bloom 1979, 12), so one could observe

¹⁶⁷ See Chinese glossary for detailed definitions of these characters.

organic patterns inside oneself and outside oneself becoming the same (de Bary 1985, 338–39). This breakthrough of understanding could develop into the more Taoist idea of wisdom that is beyond concept.

As an example of this perspective, Dr. Yi Wu once said that a difficulty with Western philosophy is that it was “textual study.” “People in the West think with their brains,” said Dr. Wu, pointing to his head. “What is needed is to understand with the *mind* (*xīn* 心)” said Dr. Wu, pointing to his heart (Y. Wu 2008c, 2013).¹⁶⁸ Fundamentally, Western understandings and presuppositions of knowledge versus wisdom, mind versus heart-mind are by definition limited, linear, sequential ways of thinking rather than an organic holistic experiential participation (Marks-Tarlow, 2012, 223).

From Neo-Confucianist Zhū Xī’s meaning, “wisdom” means to become at one with the patterns of the cosmos—at one with *lǐ* (理). To “complete wisdom” means to use the method of abiding in reverence (*jū jìng* 居敬; de Bary and Bloom 1979, 12) or to “inhabit” (Welwood, 2008a, 2008b, 2008c) the patterns of the cosmos (de Bary 1985, 338–39). This is not a process of the using the [left hemisphere] “brain” or “intellect.” It is a process of the “mind” (*xīn* 心) that is not cognitive. In Western psychological terms this is a right-hemisphere phenomenon,

¹⁶⁸ The Chinese character *xīn* (心) is translated as heart/mind, though in Western translations it is hard for Westerners to imagine thinking with the heart, so usually *xīn* is translated as “mind.” Discovering this Western bias regarding the translation of *xīn* was offered me a real breakthrough when it came to finally understanding what was meant by the Zen Buddhist term “mind.” The primary example I referenced was Shunryu Suzuki’s (1970) book *Zen Mind, Beginner’s Mind*, in context with Dr. Yi Wu’s statement about *xīn* 心 [heart-mind].

in that it is an associative patterned involvement, rather than a dissociated, sequential, intellectual involvement (Marks-Tarlow 2012, 223).

Through wisdom, human beings open to the organic patterns of the cosmos. *Wisdom* is referenced here as a term that is other-than-thought—a *contextual* participation with and an experience in the world of which we are an integral part. To “complete wisdom” is to inhabit this state fully and spontaneously, to become attuned in resonance and harmony with all that is (J. Taylor 2008).

Fathoming, Delving, and Inhabiting: Qióng (窮) and Jū jìng (居敬)

The title of this book is “A Philosophy of Pattern: Completion of Wisdom through Fathoming Organic Pattern” after an infamous phrase associated with one of the main focal points of Neo-Confucianism, *Gé wù qióng lǐ* (格物窮理), “investigation/patterning of things through fathoming pattern.” The other main idea, according to de Bary and Bloom (1979, 12) is *Jū jìng* (居敬) or “abiding in reverence.”

The idea of “abiding in reverence” suggests an attitude (inhabiting,¹⁶⁹ or embodying reverently in the process) while carrying out the method of probing, fathoming, delving, exhaustively into the patterns of things/being to the point of “forgetting the self.”¹⁷⁰ Perhaps the movement from accurately determining and

¹⁶⁹ This term *inhabiting* is directly from the work of transpersonal psychologist John Welwood, who suggests that humans can learn how to “inhabit” the body as a “field of presence” (Welwood 2008a, 2008b, 2008c).

¹⁷⁰ See Chapter 7, the section on cultivating personal resonance.

completely delving to the very depths, awareness of pattern or principle, or exhausting the ideas of pattern or principle, is a long way from “inhabiting” or *living* the depth, yet I suggest that this interpretation is valid, with the following reasoning.

I suggest that Confucius, in his instruction in the *Great Learning*, was recommending that a flexibility of consciousness be developed, across self-similar scales, from the personal to the Universal or Cosmic. When one could, according to Neo-Confucianist Zhū Xī, while inhabiting or abiding reverently (*jū jìng*, 居敬), successfully fill one’s personal self with awareness, through *gé wù* (格物, investigating/patterning things),¹⁷¹ I suggest this could be considered as “inhabiting” the patterns inside and the patterns outside that come to be seen as the same (i.e., as oneself). Once one can inhabit—or completely live within—the body, having fully investigated/patterned things through exhausting pattern, then Confucius suggests that knowledge/wisdom is complete (Gardner 2007, 137).

To continue with Legge’s (1899) translation of the *Great Learning*,

When one’s wisdom is complete, one’s thoughts are sincere. When one’s thoughts are sincere, one’s heart-mind can be straightened. When one’s

¹⁷¹ Huang (1999) quotes Zhū Xī’s reference to this process, where

“[A human being’s] nature is originally clear, but it is like a precious pearl immersed in impure water, where its luster cannot be seen. Being removed from that water, the precious pearl becomes lustrous of itself as before. If each person [them]sel[ves] could realize that it is human desire [*rén yù* 人慾] that obscures [his nature], he would find enlightenment. On this point alone one ought to concentrate with all one’s efforts. Also, one ought to do the investigation of things [*gé wù* 格物] [and]...human desires will automatically be dissolved away.” (153)

Here Huang shows how Zhū Xī sees the original nature of the human being, how it is obscured by desires, and how desires may be dissolved.

heart-mind is straightened, one's person is cultivated. When one's person is cultivated, the family can be "regulated." (358–59)

One does this, in a way, by also "inhabiting" the family, or being able to expand one's awareness into the family, so as to know the family members as one knows oneself. This continues by self-similar degrees of scale, until one expands one's awareness to know the cosmos (Gardner 1986, 20).¹⁷²

Neo-Confucianist Zhū Xī suggested that this completion of wisdom through inhabiting pattern could be accomplished by studying *dú shū* (讀書) or "book learning" half the day and sitting quietly (*jìng zuò* 靜坐) for half the day (de Bary and Bloom 1979, 12; de Bary 1985, 338–39). The study of texts, and quiet-sitting was to bring the student into alignment with the underlying, noncognitive meanings embedded within the works of the Masters. When the student had thoroughly studied and sat quietly, reverently abiding (*Jū jìng* 居敬, or "inhabiting") and delving (*qióng* 窮) into meanings embedded in the works of the Masters, he would find that he began to understand meanings that were *enfolded* in the texts, as if the Masters became personally available to him (de Bary and Bloom 1979, 12). The student could then begin to *embody* and *live* the noncognitive meanings embedded within the works of the masters. This is a very different experience than a left-hemisphere, so-called "textual-study" of sharply focused, sequential, precise, and explicit analysis presupposed and unconsciously

¹⁷² I reference here a paraphrase of a section of the *Great Learning* by Li Ao, as translated by Gardner (1986).

imposed by some translators in a largely Western philosophical approach to Chinese philosophy.

Quiet-sitting (*Jìng Zuò* 静坐) and Cultivation of the Self

The Neo-Confucian student was, after study for half the day, then directed by Zhū Xī, to practice “quiet-sitting” or *Jìng Zuò* (静坐), a style of Neo-Confucian meditation, for half the day, (e.g., de Bary 1999, 730; 1991, 1989, 1970; R. Taylor 1988, Chan 1973, 562) while abiding in reverence (de Bary and Bloom 1979, 12). This style of Neo-Confucian meditation was no doubt influenced by Ch’an Buddhism, but was different in the following respects. Ch’an Buddhism seeks to empty the mind of mind-chatter, for an immediate experience of the cosmos beyond distinctions of separateness. Ch’an Buddhism could be considered an “apophatic” approach or a way of negation; of attending to what the cosmos is *not* or “via negativa,” embracing “emptiness of separateness” for the purpose of transcendence.

The Neo-Confucian style of meditation, of quiet-sitting or *jìng zuò* (静坐), is more a process of heightening awareness, like the meditative style of psychologist John Welwood of inhabiting the body as a field of presence. In this style of meditation, one inhabits parts of the body in a step-by-step fashion, until the entire body is in a state of feeling “presence” (Welwood 2008a, 2008b, 2008c). Then, in this meditative state, one proceeds to inhabit degrees of scale that are progressively more inclusive of external experience (e.g., the room, the building, the neighborhood, the town, the city, the state, country, planet) to being inclusive of the cosmos. Quiet-sitting (*jìng zuò* 静坐) could be considered from a

Western perspective as a “kataphatic” approach, or a way of affirmation; of attending to what the cosmos *is*, also known as the “via positiva” for the purpose of embracing the unlimited.¹⁷³

In looking at the actual meanings of the Chinese characters that describe this Neo-Confucian meditation practice, the character *jíng* (靜) means “tranquility.” Paradoxically, this character is made up of compound characters,¹⁷⁴ which mean “to think vividly, and pull at truth.”¹⁷⁵ The character *zuó* (坐) means to sit: “two people on the ground.”¹⁷⁶

While Zhū Xī focused on self-cultivation by plumbing pattern (*qióng lǐ* 窮理) with an attitude of *jìng* 敬 (seriousness or reverence; written as *ching* in Chan 1973, 815) that was suggested by Cheng Yi, he came to accept the practice of tranquility (*jìng* 靜) from which to develop the capability of “abiding in reverence” (*jū jìng* 居敬; R. Taylor 1988, 16–18; de Bary and Bloom 1979, 12). Zhū Xī came to suggest “quiet-sitting” (*jìng zuò* 靜坐) half the day, and study half the day for the *cultivation* of this attitude of reverence (R. Taylor 1988, 18; Ching 2000, 119–26).

¹⁷³ It is important to note that the Western apophatic and the kataphatic approaches are converse methods for doing the same thing—in attending to the unlimited quality of the cosmos.

¹⁷⁴ See Chinese glossary (Appendix B) for *jíng* (靜).

¹⁷⁵ See Chinese glossary (Appendix B) for *jíng* (靜).

¹⁷⁶ A person is *rén* (人), and earth is *tǔ* (土); see Chinese glossary for *zuò* (坐).

This idea of “abiding in reverence” (*jū jìng* 居敬) is cultivated through a practice of tranquility (*jìng* 靜), while one delves into the depths of organic pattern, to find that organic pattern is the same inside and outside. This method of inhabiting the cosmos at *all* scales is taught in the Great Learning or *Dà Xué* (大學; de Bary and Bloom 1999, 730). There is a kind of vitality that one finds through inhabiting the cosmos in a tranquil state, noticing how activity emerges from tranquility, that is quite different from the “no-mind” of Ch’an. Ch’an also has no “goal” of reaching any altered state, though certainly as one engages with no-mind, one’s state does change (Wallace 2007, 99).

Focal Passage: Zhū Xī Quote from Sentences and Phrases of the Great Learning (Dà Xué Zhāng Jù 大學章句)

A focus of this book is on the following quote by Zhū Xī, which led to the title of the book. In a way, this passage epitomizes the focus of Neo-Confucianism and Zhū Xī’s “School of Organic Pattern,” Lǐ Xué (理學), which is also known in conventional translation as the “School of Principle.” In this discussion, the meaning of the quote is transformed by the content of the study in previous chapters.

According to William Theodore DeBary (1985, 338), Zhū Xī said the following (the specific phrases I then retranslate are shown underlined):

The foregoing fifth chapter of the commentary explained the meaning of “investigation of things and the extension of knowledge.” but is now lost. I have ventured to draw upon the ideas of Master Ch’eng [Yi] to supply it. That the “extension of knowledge consists in the investigation of things” means that, wishing to extend one’s knowledge, one must fathom the principles in each thing or affair as it presents itself to us. The spiritual intelligence of man always seeks to know, and the things and affairs of

this world all have their principles. But if there are principles yet unfathomed, man's knowledge is incomplete. Therefore the *Great Learning*, at the outset of its instruction, insists that the student, in regard to the things and affairs of the world, proceed from what he already knows of their principles and fathom them to their utmost limit. After exerting himself for a long time, one day he will experience a breakthrough to integral comprehension. Then there will be nothing in the multiplicity of things external or internal, fine or coarse, that is beyond one's reach, and nothing in the whole substance and great functioning of the mind that will not be fully clarified. This is what is meant by the investigation of things, the extension of knowledge.

I make specific changes in Dr. de Bary's (1985, 338) translation, as follows

(changes shown underlined):

The foregoing fifth chapter of the commentary explained the meaning of "patterning of things and the completion of wisdom," but is now lost. I have ventured to draw upon the ideas of Master Ch'eng [Yi] to supply it. That the "completion of wisdom consists in the patterning of things" means that, wishing to complete one's wisdom, one must probe the patterns in each thing or affair as it presents itself to us. The spiritual intelligence of man always seeks to know, and the things and affairs of this world all have their patterns. But if there are patterns yet unprobed, man's wisdom is incomplete. Therefore the *Great Learning*, at the outset of its instruction, insists that the student, in regard to the things and affairs of the world, proceed from what he already knows of their patterns and probe them to their utmost limit. After exerting himself for a long time, one day he will experience a breakthrough to integral comprehension. Then there will be nothing in the multiplicity of things external or internal, fine or coarse, that is beyond one's reach, and nothing in the whole substance and great functioning of the mind that will not be fully clarified. This is what is meant by the patterning of things, the completion of wisdom.

The following is the Chinese text as written by Zhū Xī. I make a character by character translation so the reader can see the differences in the conventional Western translations by de Bary (1985, 338) and my speculative translations, which are based on an organismic and complexity science basis.

The key to the following paragraphs is as follows: the first line of each paragraph is in traditional Chinese characters, the second line is the pronunciation

of the characters in Pinyin.¹⁷⁷ The third line is my literal, speculative translation of the characters, and the fourth line is de Bary's (1985) English translation. The parts of the English text that are underlined in the third and fourth lines of each paragraph show the differences in translation of the Chinese characters. The traditional Chinese characters are from (Zhū Xī 2013 [ca. 1200], para. 6).

右 傳 之 五 章 蓋 釋 格 物
 yòu fù zhī wǔ zhāng gài shì gé wù
 Right teacher's fifth chaptercover explain pattern things
The foregoing fifth chapter of the commentary explained the meaning of
"investigation of things"

致 知 之 義。 而 今 亡 矣
 zhì zhī zhī yì. ér jīn wáng yǐ
 complete wisdom 's meaning, but present lost already.
and the extension of knowledge," but is now lost.

此 章 舊 本 通 下 章， 誤
 cǐ zhāng jiù běn tōng xià zhāng wù
 This chapterold root communicate under chaptermistake
I have ventured to

在 經 文 之 下。 閒 嘗
 zài jīng wén zhī xià xián cháng
 exist classic works 's under. Tranquil* experience
draw upon

竊 取 程 子 之 意
 qiè qǔ chéng zǐ zhī yì
 try take Chéng Master 's thought
ideas of Master Ch'eng [Yi]

¹⁷⁷ Pinyin is the standardization of Romanization and pronunciation of Chinese characters put in place by the Mainland Chinese government in 1958 (A Little Dynasty Chinese School, "History of Hanyu Pinyin," 2013). It was revised several times and adopted by the International Standardization Organization (ISO) in 1981. It was adopted in Taiwan as the New Phonetic System in 2009 (Pinyin Joe, 2005–2014, paras. 5–6).

以 補 之 曰：
 yǐ bǔ zhī yuē:
 from accord 's said:
to supply it.

所 謂 致 知 在 格 物 者，
 suǒ wèi zhì zhī zài gé wù zhě,
 So-called complete/perfect wisdom exist pattern things person,
That the “extension of knowledge consists in the investigation of things”

言 欲 致 吾 之 知，
 yán yù zhì wú zhī zhī.
 say want complete/perfect our 's wisdom.
means that, wishing to extend one's knowledge,

在 即 物 而 窮 其 理 也。
 zài jí wù ér qióng qí lǐ yě.
 exist quicklybeing you delve their pattern also.
one must fathom the principles in each thing or affair as it presents itself to us.

蓋 人 心 之 靈 莫 不 有 知，
 Gài rén xīn zhī líng mò bù yǒu zhī,
 That person heart 's spirit not not have wisdom.
The spiritual intelligence of man always seeks to know,

而 天 下 之 物 莫 不 有 理
 ér tiān xià zhī wú mò bù yǒu lǐ
 this heaven/earth 's being not not have pattern,
and the things and affairs of this world all have their principles.

惟 於 理 有 未 窮，
 wéi yú lǐ yǒu wèi qióng,
 however exist pattern have not yet delved.
But if there are principles yet unfathomed,

故 其 知 有 不 盡 也。
 gù qí zhī yǒu bù jìn yě.
 therefore their wisdom have not complete also.
man's knowledge is incomplete.

是 以 大 學 始 教
 Shí yǐ dà xué shǐ jiào
 Right with great learning begin teach
Therefore the Great Learning, at the outset of its instruction,

必 使 學 者 即 凡 天 下 之
 bì shǐ xué zhě jí fán tiān xià zhī
 must use learning person quick all/every heaven/earth 's
insists that the student, in regard to the things and affairs of the world,

物 莫 不 因 其 已 知 之
 wù, mò bù yīn qí yǐ zhī zhī
 things, not not cause their complete wisdom 's
proceed from what he already knows of their

理 而 益 窮 之,
 lǐ ér yì qióng zhī,
pattern and more delve 's,
principles and fathom

以 求 至 乎 其 極。
 yǐ qiú zhì hū qí jí.
 use seek reach at their utmost.
them to their utmost limit.

至 於 用 力 之 久,
 zhì yú yòng lì zhī jiǔ
 Add to use power 's time passage
After exerting himself for a long time,

而 一 旦 豁 然 貫 通 焉,
 ér yī dàn huō rán guàn tōng yān
 this one day clear actually go thru communicate these
one day he will experience a breakthrough to integral comprehension.

則 眾 物 之 表 裏 精
 zé zhòng wù zhī biǎo lǐ jīng
 then people things 's show interioressence/spirit
Then there will be nothing in the multiplicity of things external or internal,

粗 無 不 到，
 cū wú bù dào,
 coarse not not arrive,
fine or coarse, that is beyond one's reach,

而 吾 心 之 全 體 大 用
 ér wú xīn zhī quán tǐ dà yòng
 this my heart/mind 's complete body great use
and nothing in the whole substance and great functioning of the mind

無 不 明 矣。此 謂 物 格
 wú bù míng yǐ. cǐ wèi wù gé,
 not not bright already. This speak things pattern,
that will not be fully clarified. This is what is meant by the investigation of things,

此 謂 知 之 至 也。¹⁷⁸
 cǐ wèi zhī zhī zhì yě.
 this speak wisdom 's perfect/ complete also.
the extension of knowledge.

As one can see, my speculative, and literal translations of Chinese characters differs significantly with the English translation of de Bary (1985). I thought it would be informative for the reader to be able to see the differences, which are not only textual, but presuppositional, showing the differences between

¹⁷⁸ This is the Chinese text of the *Dà Xué Jang Ju* as it is written.

大學章句：6a-b

右傳之五章，蓋釋格物、致知之義，而今亡矣。此章舊本通下章，誤在經文之下。

閒嘗竊取程子之意以補之曰：「所謂致知在格物者，言欲致吾之知，在即物而窮其理也。蓋人心之靈莫不有知，而天下之物莫不有理，惟於理有未窮，故其知有不盡也。是以大學始教，必使學者即凡天下之物，莫不因其已知之理而益窮之，以求至乎其極。至於用力之久，而一旦豁然貫通焉，則眾物之表裏精粗無不到，而吾心之全體大用無不明矣。此謂物格，此謂知之至也。」

Eastern and Western philosophies highlighted by Terry Marks-Tarlow's (2012, 221–25) comments on the differences between knowledge and wisdom above (refer to Chapter 6, section on Terry Marks-Tarlow, Figure 1).

The Completion of Wisdom

How does finding patterns inside and outside to be the same, lead to the completion of wisdom? As above, Zhū Xī outlines that in finding the patterns inside and the patterns outside to be the same,

there is nothing in the multiplicity of being...that is beyond one's reach, and nothing in the whole substance and great functioning of the mind that will not be fully clarified. (de Bary 1985, 338–39, de Bary 1991, 76–77)

This statement can then be further clarified by bringing to the process the patterns of complexity science, and the fractal nature of the self that Terry Marks-Tarlow (1999, 2002) offers. The organic patterns of complexity science add a multidimensional and holographic notion of not only the individual self, but the cosmos-as-self, as connected in organic *patterns* of being.

Berry (2003, 44) speaks of the structure of reality in Chinese philosophy:

There did exist in China a sense of the integral structure of reality such that the activity of any part flowed throughout the entire structure. In Confucian terms, the true ruler only needed to sit on his throne facing south and all activities of the realm responded in a grand harmony....What developed in China was a remarkable sense not of individualism but of humanity *having both a microphase and a macrophase*. The macrophase is the same individual as present to the entire order of reality. (Emphasis mine; Berry 2003, 44)

Confucius...remains the archetypal union of microphase-macrophase dimensions...provid(ing) an all encompassing organic metaphor of the Cosmic Person. Although Confucius is dealing constantly with the microphase aspect of his disciples, he is outlining the larger dimensions of the human personality to be reached in terms of identity experiences. (Berry 2003, 46)

Bringing organic patterns of complexity science to Western philosophy shows how the original “left-brain deliberati[ive]”(Marks-Tarlow 2012, 225) ontological split of Western philosophy (e.g., Berry 2003, 40–43) is thus brought to a “nonoverlapping realm of understanding”(Marks-Tarlow 2012, 225) in context, relationship, and harmony with the “nonlinear realm of right-brain intuition” (Marks-Tarlow 2012, 225) of organismic ontology of Chinese philosophy (Mote 1971, 17–19; Berry 2003, 43, 44).

Terry Marks-Tarlow’s Psychological Patterns of Self: The Self as a Dynamical System

In bringing patterns of fractal geometry into her work with the psyche, Marks-Tarlow (1999, 2002, 2004, 2008a, 2008b, 2010, 2011, 2012) effectively opens complex and fractal patterns of human internal psychological experience to interpretation, through comparison with complex and fractal patterns of the external world. This bringing patterns of fractal geometry into work with the psyche is parallel with the recommendations of Zhū Xī and the Cheng brothers (de Bary 1985, 338-39), as it invites the student to notice how patterns inside and outside are the same. Here, also, Marks-Tarlow brings focus to the emergence of what is termed “the self,”

Fractals embody the essence of how identity forms in nature. Being multidimensional objects with detail on multiple levels, fractals illuminate how different aspects of the self can emerge at different times, across different situations. Fractal properties of self-similarity, scale invariance and power laws help us to understand how identity can be preserved across scale, ranging from extremely fast moving , micro, neurobiological levels that unconsciously support the hardware of self, to minute-to-minute interactions that tune our brains and minds in an ongoing way, to slow moving large-scale events comprising episodic memory and slowest of all—our sense of self across a lifetime. (Marks-Tarlow 2008b, 179)

After finding oneself in unity with the organic patterns of the cosmos, through complexity science, one can see specifically how the identity is broadened through participation in varying degrees of organic patterns. As the personality of the infant arises out of the coupled system that exists between mother and child (Schoore 1994, 26), so do human beings then arise out of the coupled system of the cosmos. “Just as an apple tree ‘apples,’ the earth ‘peoples,’ and we are not so much born into this world as grown out of it.” (A. Watts 1995, 7–8).

Human beings are organic patterns, organic patterns without an independent existence—something the cosmos is *doing*. Human beings are not independent of the cosmos. Alan Watts (Jacobs 1973) says that one can use a “trick” to bridge the common-sense, Aristotelian and Genesis-based gap between the Western ideas of subject/object, spirit-mind/material, form/substance, and other such splits by referring to them as *patterns*. “Serious” physicists no longer think of the world in dichotomies like this anymore. The energy and the pattern are the same thing (but Zhou Dunyi acknowledged that actually the pattern, *lǐ* 理, came first, before *qì* 氣; (Sun 1966, 172, 181, 184).¹⁷⁹

Ontology, East and West

There is something quite important here about the difference between the way that conventional, modern Western philosophy and much of Chinese philosophy understand basic ontology. As shown by Figure 1 above, while the West understands that human beings are separated from the cosmos, (Tu and

¹⁷⁹ See Chapter 5, section on *lǐ* (理) and *qì* (氣) for this reference.

Tucker 2003, 41), in a causal, subject–object relationship, Chinese philosophy understands the cosmos as an acausal field of becoming (Ames, Dissanayake, and Kasulis 1994; Hall and Ames 1987, 237–44; 1995, 1998), where human beings are not separated things, bouncing around in an inanimate world, but are patterns of processes that arise together in a field of becoming. Organic patterns discovered through Western complexity science can help to show how Chinese philosophy understands the idea of organic pattern in an organismic cosmos, and the metaphors of Chinese philosophy can facilitate a nonmathematical understanding of what Western complexity science is dis-covering.

Chapter 7: Epilog—Resonance and Harmony

Throughout this book, I have been uncovering ways of looking at organic patterns through parallels between Chinese philosophy and complexity science. These organic patterns are, in this analysis, analogous to patterns of sound and vibration, resonance and harmony. I found during this research and within Chinese philosophy in general, and within the works of Confucius specifically, that themes of resonance and harmony have been consistently present.

This final chapter concerns cultivating the self through understanding resonance and harmony. These two key terms are first explored in Chinese, Western, and musical modes. I then discuss how resonance and harmony work together as organic patterns, bringing the threads of ideas explored in Chapters 2 through 6 together into the final weave. The final weave is as follows: abiding in reverence while patterning things leads to the completion of wisdom through uncovering and *inhabiting* organic pattern, and develops the state of *functional transparency* in interacting with the organic patterns of the cosmos.

The statements I make in this chapter and in appendix E regarding music theory, physics of sound, and mechanics of piano tuning are based on my 43 years of experience as a professional piano technician. While some citation of scholarly work in these areas has been made, much of the discussion of these topics is from my personal experience.

On Resonance (gǎn yìng 感應)

An important idea in applied physics and sound, resonance can offer a potent analog to understanding stimuli and responses between and within

vibrating organic systems not ordinarily associated with physics and sound in the West.¹⁸⁰ Musicologist Gareth Loy (2006, 270) describes *resonance* as “the tendency of a system to vibrate sympathetically at a particular frequency in response to energy induced at that frequency.” More technically, “resonance can be described with just three characteristics of vibration: displacement, velocity, and acceleration” (Loy 2007, 297). This is a purely *mechanical* description of resonance.

Representing a mainstream Western understanding, the *OED* (2013g) describes *resonance* as

The reinforcement or prolongation of sound by reflection or by the synchronous vibration of a surrounding space or a neighboring object. Also: a sound, or quality of sound, resulting from this. (def. 1a)

In this definition, the *OED* cites “1776, C. Burney Gen. Hist. Music I. 155: ‘Resonance is but an aggregate of echos, or of quick repetitions and returns of the same sound’” (2013g, 1a).

The idea of resonance in Chinese is at first nearly identical to that in the West—the Chinese characters *gǎn yìng* (感應), which are translated as “resonance,” more precisely mean “stimulus-response” (LeBlanc 1985, xii, 8; Major et al. 2010, 207, 875; see also Appendices B and E). However, the meaning of resonance in Chinese philosophy is expanded far beyond applied physics and sound. To illuminate the foundation of the Chinese understanding of resonance, I

¹⁸⁰ Regarding resonance as a potent analog, I refer the reader to the infamous collapse of the Tacoma Narrows Bridge on November 7, 1940, where the bridge was destroyed by simple and undamped harmonic resonance set up by local wind conditions (Hobbs, 2006).

first describe Zhuangzi's example of mechanical resonance in Chinese philosophy. To explore the broader understanding of resonance in Chinese philosophy, I then provide an example of the power of *personal* resonance and discuss several examples of philosophical resonance.

A story in about a lute tuner in Zhuangzi illustrates the Chinese idea of resonance as a mutual, mechanical sounding or echoing of one vibrating string with another. This story is also repeated in the *Huái Nán Zǐ* (淮南子), Chapter 6.

From Zhuangzi:

Thereupon he tuned two lutes, placed one in the hall, and the other in an inner room. When he struck the *kung* note on one lute, the *kung* note on the other lute sounded; when he struck the *chüeh* note, the other *chüeh* note sounded—the pitch of the two instruments were in perfect accord. Then he changes the tuning on one string so that it no longer corresponded to any of the five notes. When he plucked this string, it set all the twenty-five strings of the other instrument jangling. (Watson 1967, 267–68)

This story of the lute tuner begins to illustrate the power of resonance as sympathetic vibrations of sound.¹⁸¹ There is an analog in how the sympathetic resonances between instruments can suggest in empathic response between people and other systems of natural organic pattern. I hypothesize that this analog can demonstrate how a walk in the woods or by the seashore is so invigorating.

In my service life as a piano technician, I have focused on understanding this phenomenon of the excitation of multiple strings in a piano (or other items in the room with the piano) by powerful vibrations emitted in the sounding of one or more notes on the piano (Teki et al. 2012). On numerous occasions, a piano

¹⁸¹ See Appendix E for an explanation of mutual resonance.

tuning client called to complain about certain “buzzing” sounds “in the piano” after I had finished tuning the piano and departed from the client’s home. When a piano is tuned, all of the strings are aligned to a specific protocol, so after a tuning, the tuned piano is much more coherent and powerful in emitting particular pitches of sound than it was prior to the tuning. When I investigated the customer complaint, most of the “buzzing” sounds that customers complained about turned out to be from sources *other than* the recently tuned piano, such as picture frames or other items which had been set on top of the piano and would sympathetically vibrate when the piano was played. In one case the buzzing sound was coming from a piece of loosened crown molding in the high corners of the room where the wall met the ceiling of the customer’s living room. These objects, which sympathetically vibrated when notes on the piano were played, offer illustrations of resonance: the piano was the stimulus, and the sympathetically vibrating objects responded.

Resonance has great importance in Chinese philosophy. As an example, the ancient sage-kings were said to have literally *ordered the world* through their *personal* resonance (*gǎn yìng* 感應; stimulus-response)—affecting their kingdoms by their [personal] potency [of moral conduct], *beyond* wisdom and precedent (e.g., LeBlanc 1985, 110–11; Major et al. 2010, 208–09).¹⁸² This beneficent

¹⁸² This idea of the influence of the personal resonance of a sage-king on the ordering of the world is the same resonance as described by the nested complexity term of self-similarity in Confucius’s *Great Learning* (*Dà Xué* 大學; see Chapter 5). This nested quality of resonant influence is also expressed in the Five Confucian relationships or *wǔ lún* (五倫), particularly regard to the first relationship of ruler/subject (see Chapter 3).

ordering of the world was expressed by harvests of ample food for the populace, and through peace and prosperity in the kingdom. When tyrants were in power, the world also responded resonantly to personal ego-based and tyrannical mis-rule by offering famine, drought, deforestation, and warfare (Major et al. 2010, 208–9). In discussing the Chinese idea of resonance, LeBlanc (1985) explains how it extends beyond a simple description of sound and music:

all things in the universe are interrelated and influence each other according to pre-set patterns, so that interaction appears as spontaneous and not caused by an external agent. The idea of resonance thus plays the role of a cosmological principle [a patterning], that is, a rational device whereby to understand the universe as a totality, man being [a resonant] part of that totality. (LeBlanc 1985, 8–9)

Resonance can thus be seen as a mode of sympathetic and responsive interaction between vibrating entities, which is a conclusion that I have reached based on everything I have shown so far.

LeBlanc (1985, 8–9) discusses a broadened application of resonance as a mode of sympathetic interaction in that resonance was a

catalyst which blended together ideas originating from Taoism on the one hand and those from the School of *Yin-Yang* on the other, *thus broadening the scope of each* [italics added]. We have reason to believe that resonance was a key notion of the “Chinese philosophy of organism” whose roots can be traced back to the earlier strata of *Yi Jīng* 易經, (Book of Changes), which was formulated in a systematic way in *Huai-nan Tzu* and which found its perfect expression centuries later in the cosmological writings of the Neo-Confucianists of the Sung dynasty (960–1276).

Here, LeBlanc (1985) speculates on a developmental connection between resonance and the organic patterns that were first explored in the archetypal figures of the *Book of Changes* and later developed in the “School of Organic Pattern” or *Lǐ Xue* (理學, see Chapter 2 on Neo-Confucianism). For Western

applied physics and sound, which use a limited, logical meaning and application for resonance, the expanded meanings of resonance in Chinese philosophy afford a significantly broadened parallel mode through which to personally inhabit and engage with the organic patterns of which each person is a part. Sympathetic people anywhere can, through this expanded mode, engage in right-hemisphere wisdom experiences and come to express and understand organic pattern through personal [resonance] (J. Taylor, 2008).

In piano tuning, adjusting the relationships between the harmonics of specific pitches of piano strings, guides the technician in setting an appropriate relationship and context for all the pitches in a reference octave. Based on the Chinese philosophical concept of personal resonance, I suggest the idea of attuning *oneself* (Teki et al. 2012): a similar sort of adjustment of relationships and potentials performed between resonant internal archetypes (e.g., Robertson and Combs 1995) or subpersonalities (e.g., Plotkin 2013, 14, 125–234), as examples. In such attunement, one's personal temperament might also be structured—yet such a structuring would be vital, vibrant, complex, nonlinear, and dynamic, as any other living system (referenced in Chapter 4).

Chinese philosophy teaches that personal resonance can be cultivated through abiding in reverence (*jū jìng* 居敬) and completing wisdom (through inhabiting/abiding) and fathoming organic pattern (*zhì zhī qióng lǐ* 致知窮理; de Bary 1979, 12). This personal resonance can be held through *intention* (Major et al. 2010, 208–9). As the complex personal resonances of the nonlinear dynamical system that is the self are always present, the cosmos responds with life

circumstances—as one lute responds to another. Through this sort of personal cultivation, of bringing the various resonances of oneself into accord (in multidimensional relationships, contexts, and what can be understood as harmony within oneself and with the nonlinear and dynamic organic patterns of the cosmos), the cosmos *responds* to this potent attunement of the complexity of personality.

This attunement is found in works by Zhuangzi, and twelfth-century Japanese Zen patriarch Dōgen, about “forgetting oneself.” Zhuangzi spoke of “fasting the (heart)-mind.”

Confucius said, “Make your will one! Don’t listen with your ears, listen with your (heart)-mind [xīn 心]. No, don’t listen with your mind, but listen with your spirit [qi 氣]. Listening stops with the ears, the mind stops with recognition, but spirit is empty and waits on all things. The Way [*Dào* 道] gathers in emptiness alone. Emptiness is fasting of the mind.”¹⁸³ (Watson 1968, 57–58)

“Shen Tao discarded knowledge, did away with self, followed with he could not help but follow, acquiescent and unmeddling where things were concerned, taking this to be [organic pattern]¹⁸⁴ of the *Dào* [道].”¹⁸⁵ (Watson, 1968, 370)

Here again is the idea of discarding concept in favor of the organic pattern of the *dào* (道). In 1225, Zen patriarch Dōgen Zenji studied in China with Rujing who was an abbot of the Caodong School (Tanahashi 1999, xx). Dōgen

¹⁸³ Chinese text: 仲尼曰：「若一志，无聽之以耳而聽之以心，无聽之以心而聽之以氣。聽止於耳，心止於符。氣也者，虛而待物者也。唯道集虛。虛者，心齋也。(Zhuangzi 2013c, verse 2).

¹⁸⁴ This is my retranslation of the term “*li* (理)” as “organic pattern,” rather than as “principle.”

¹⁸⁵ Chinese text: 是故慎到，棄知去己，而緣不得已，泠汰於物以為道理 (Zhuangzi 2013d, verse 4).

recapitulates the *dàoist* theme of Zhuangzi in Verse 4 of “Actualizing the Fundamental Point”:

To study the Buddha way is to study the self. To study the self is to forget the self. To forget the self is to be actualized by the myriad things.¹⁸⁶
 When actualized by myriad things, your body and mind as well as the bodies and minds of others drop away. No trace of realization remains, and this no-trace continues endlessly. (Tanahashi 1985, 70)

When the self is forgotten in functional transparency and knowledge is discarded, direct noncognitive resonant participation with the organic patterns of the cosmos occurs. In the condition of functional transparency, one is engaged in a flow state (Csikszentmihaly 1990), or self-actualization (Maslow 1968, xix), or unconscious supercompetence (Howell, 1982, 100), where one has *inhabited* the cosmos, and thought is no impediment to the flow. One acts naturally, without hesitation or forethought, in harmony with the cosmos.

On Harmony (hé 和)

Harmony is an idea in music that can offer another potent analog to understanding responses between and within vibrating organic systems not ordinarily associated with music. In music, *harmony* is the difference in, the *relationship between*, and the *context of* musical notes that *connects* the notes.¹⁸⁷

If there is no difference between two notes, the note is the same note; this is called

¹⁸⁶ Myriad things is a way to say “everything in the world.”

¹⁸⁷ So-called “tone-deaf” people are those who cannot hear the relationship between the notes that connects the notes, and therefore only hear the notes as “noise.”

a “unison.”¹⁸⁸ If there are differences, it is the *relationship* between two or more notes that is heard when those notes are sounded simultaneously, or sounded in a sequence through time. Musical pitches also have *harmonics*, which are also called *partials*—in that harmonics are *parts* of the complex quality of a pitch.¹⁸⁹ One of the relationships between two different notes is that the two notes may have some of the same harmonics that resonate with each other (as unisons).¹⁹⁰

¹⁸⁸ About 60% of the notes in a normal piano are triple strings, 30% are double strings, and 10% are single strings. One must tune the notes that have multiple strings so the pianist cannot distinguish that there is actually more than a single string per note, other than the effect that multiple strings, when tuned together to sound the same note, produce a higher amplitude of sound for that note than a single string.

¹⁸⁹ See Appendix E on sound.

¹⁹⁰ This is personal knowledge gained in my training and 43 years of experience (as of Fall 2013) as a piano technician. The first of many books I studied on piano technology regarding these points was by William Braid White (1946).

A single string, also known as a monochord, can have a musical sound. This sound is the number of vibrations per second it has (known as the pitch or frequency), in units known as cycles or vibrations per second the string makes when plucked, now known as Hz (hertz). This number of vibrations per second in differently pitched strings varies, according to the thickness of the string, how long it is, and how tight it is stretched between two fixed points.

The sound of a vibrating string has many harmonics or parts to it. One can divide the string in half, thirds, quarters, fifths, sixths, and so forth, to produce different harmonics or partials (parts) of the sound of the string. Two different strings played together can have a certain relationship to each other, called an interval. The interval or distance between the notes is determined by what are called scale degrees. The two notes, while being different notes, can have harmonics or partials that are the same.

For example, one can take two strings, A3 at 220 Hz (a lower note) and E4 at 330 Hz (a higher note). Lower and higher are references to the speed of vibration of the strings. The two example strings are at an interval a fifth, or five scale degrees between notes, of A3 at 220 Hz (the lower note) and E4 at 330 Hz (the higher note). The second harmonic or partial of the higher note E4 at 330 Hz would be E5 at 660 Hz, because when one divides the string in half, the pitch *doubles*. The third harmonic or partial of A3 at 220 Hz would *also* be E5 at 660 Hz, because when one divides the string by thirds the pitch *triples*. So the two pitches of E4 at 330 Hz and A3 at 220 Hz *resonate with* the different harmonic partial of each string—that resonance is the *unison* of E5 at 660 Hz—which is the same pitch between the two different strings.

In terms of how human characteristics are analogous to musical notes that have harmony, harmonics, and resonance; certain linguistic, physical, behavioral, emotional, psychic, psychological, and spiritual vibratory patterns have been observed in human beings, within and between people.¹⁹¹ Examples of these patterns are known to some as “archetypes,” and some scholars (e.g., Jung 1953–1969; Sheldrake 1988, 1981; Conforti 2003, 2008) feel that human beings emerge from and as a result of patterns and momentums that under-gird human consciousness and experience. Other scholars (e.g., Satir 1967, 1972) talk about “parts” of the self. When one is “well adjusted,” and “happy” within the self, one experiences harmony between the parts and with the deeply underlying archetypes.

A person can connect vibrationally through the resonances and harmonics of parts and archetypes in one’s-self, others, and the organic patterns of the cosmos. Having an affinity toward a person or thing means that one vibrates in unison or resonates with another person, situation, or thing—one makes an actual

The resonance referred to in the quote from Zhuangzi (Watson 1968, 267–68) was about two strings on two different instruments that were *tuned to the same pitch*. The vibrations of the air set up by plucking the string of one instrument influenced the second instrument by stimulus of the vibrating air, and set the same pitched string to vibrating on the second instrument. It is very interesting, then to consider how strings that are pitched differently can still stimulate each other, through harmonics or partials. While A3 at 220 Hz is a *different note* than E4 at 330 Hz, when the A3 string is plucked, the second harmonic or partial of the string E4, and the third harmonic or partial of A3 on a the same and *different* instruments can also be stimulated, through this resonance of partials. In this case the resonant partial in common would be E5 at 660 Hz. This effect is multiplied by many strings on many instruments.

¹⁹¹ I direct the reader’s attention to Terry Marks-Tarlow’s use of *context* in Chapter 7, in the section on knowledge, intuition and wisdom, in her referring to the application of components of wisdom.

resonant connection with that person, situation, or thing. In a very real way, where such resonance is found, because one resonates as a unison with an other, one is in a state of unity with that part of the other, and the other is no longer a separated part of one's self.

Harmony (*hé* 和) is one of the most basic and important ideas in Chinese philosophy (e.g., Chan 1973; Cua 2003; Fung 1952, Feng and Hughes 1947; LeBlanc 1985; Major et al. 2010; Tu and Tucker 2003; Zhang 2002). Harmony, to Confucius, is an attribute whereby a human being can develop a connection and relationship in context with the divine in ordering the cosmos. Zhū Xī offers these relevant passages in his *Doctrine of the Mean* or *Zhōng yōng* (中庸; Gardner 2007) that illustrate this point:

“What Heaven decrees is called ‘the nature’; to follow the nature is called ‘the Way’; to cultivate the way is called instruction.” (Gardner 2007, 110; Chapter 1, verse 1)

“Before pleasure, anger, sorrow, and joy have arisen—this we call perfect balance. After they have arisen and attained *due proportion* [italics added]—this we call Harmony. Perfect balance is the great foundation of the universe, harmony is the way that unfolds throughout the universe.” (110; Chapter 1, verse 4)

“Let perfect balance and harmony be realized and Heaven and Earth will find their proper places therein; and the ten thousand creatures will be nourished therein.” (111; Chapter 1, verse 5)

“For the superior man to entrust himself to perfect balance and the constant, and to withdraw from the world unrecognized, without any regrets, no one but a sage is capable of this.” (115; Chapter 11, verse 3)

These passages reflect how this idea of context, relationship, harmony, and ordering between resonant parts is developed in Chinese philosophy. Gardner concludes that “Cultivation of the self as the *basis* of order and harmony in the

family...is the theme of the *Great Learning*” (Gardner 2007, 121). I hypothesize that experiencing and attuning personal resonance in relationships, contexts, and harmony with the organic patterns of one’s family leads to greater connection within the family.

Personal attuning with and in nature is why a walk in the woods or by the seashore is so invigorating, and why, for some, a crowded, high traffic, polluted urban landscape is so uncomfortable. Many of my parts, which are fractal,¹⁹² resonate with the fractal patterns of the natural world—and I participate (and thus attune myself) in a relationship that connects me, to become at one and enlivened with the natural organic patterns in these places. Conversely, the stressful effects and resonances of certain people, places, and types of architecture are disharmonious; examples such as unpleasant people, penitentiaries, deteriorating and polluted urban landscapes take life energy rather than giving it.¹⁹³ Understanding harmony and resonance is critical to cultivating oneself.

The Completion of Wisdom through Inhabiting Pattern: Cultivating the Self

Through the cultivation of the self, and the completion of wisdom, relationship with the cosmos—or harmony with the *dào* (道)—is realized. Of harmony (*hé* 和) and the *dào* (道), LeBlanc (1985, 116) says

¹⁹² My own fractal parts include my lungs, vascular system, central nervous system, and according to Terry Marks-Tarlow and others, my self and psyche (Marks-Tarlow 2008; personal communication with author, February 2013).

¹⁹³ Of course, some individuals seem to enjoy and indeed thrive in urban environments, and so have a different experience of relationships and contexts in such settings. Yet, such experience comes at the cost of dis-connection with the organic patterns of the natural world.

the most subtle essences [*jīng* 精] spontaneously [*zì rán* 自然] create orderly patterns and bring about, through human agency, the reign of *hé* (和)(harmony). *Dào* 道 (the Way) and *hé* (和)(harmony) are often combined in the *Huai Nan Tzu*...*Hé* (和), being a manifestation and a result of *dào* (道), often stands, by metonymy, for *dào* (道).

Thus, when one finds spontaneous relationship within organic patterns of the cosmos, then, one could be said to be in harmony with the *dào* (道). *The Doctrine of the Mean* is a mode through which to bring awareness to harmony with the cosmos through the cultivation, realization, and completion of the self (Gardner 2007, 120, 124, 125). Along with harmony, it is relevant to also bring in the idea of resonance from Chapter 6 of the *Huái Nán Zǐ* (淮南子): resonance expresses the “one spontaneously self-generating process” (Mote, 1971, 19) of the cosmos (LeBlanc 1985, Major et al. 2010).

In Chapter 6, I explored the difference between knowledge and wisdom, and how to “complete” wisdom—in forgetting the self. In reaching a noncognitive state of the completion of wisdom, the resonance of complex patterns of and within the individual are brought to transparency with—and are in harmony with—the complex organic patterns of the cosmos or *tian dào* (天道).¹⁹⁴ The patterns of the individual become attuned to and completely integrated with the larger patterns of the cosmos. In other words, when the resonances of the individual come into harmony with the *dào* (道), there is no separation from the fractal and organic patterns of the cosmos. This is the completion of wisdom through plumbing pattern.

¹⁹⁴ *Tiān dào* (天道) is literally “heaven’s way.”

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Appendix A: Brain Hemisphericity

While in the editing process of this book, a question of currency in controversial psychological and neurophysiological theory as of this writing [Summer and Fall 2013] was raised in regards to my references throughout this project of the bi-cameral (Jaynes 1976) of nature of the human brain. What I refer to is the bi-hemispheric structure of the brain. Throughout this book, I make reference to these hemispheres of the brain as the right hemisphere or the left hemisphere. I begin this appendix with offering expanded though limited explanations of my argument in favor of the utility of attending to brain hemisphericity. I conclude this appendix with a cursory look at counterarguments to brain hemisphericity.

In one's day to day life experiences, one finds oneself in a habitual practice of ways of interacting and attending to the world (Sheldrake 2012, 125; Ornstein 1997, 16). These habitual and largely unconscious ways of interacting and attending with the world can be usefully assessed and referenced through attending to right and left hemisphere *experiential* modalities, as shown below. These habitual modalities shape one's experience in the world. The more aware one can become of one's habits of attending, the greater freedom one has to choose *how* to attend in the world. My intention in referencing right and left hemispheric modalities in this book is to invite conscious awareness of the experiential differences between the hemispheres, rather than make any judgment about or absolute distinction between discrete functions of the right or left hemispheres.

It is beyond the scope of this book to go into the history and development of the studies of brain hemisphericity and function. Yet, because of technological developments such as functional Magnetic Resonance Imaging (fMRI) and Positron Emission Tomography (PET), scholars and scientists now have significantly better resolution of monitoring and locating activity of real-time brain hemisphere function than ever before.

In this book, other than the work of Dr. Terry Marks-Tarlow (2012), I primarily reference two scholarly books on the topic of brain hemisphericity. The first is *My Stroke of Insight* by Harvard and University of Indiana neurophysiologist Jill Bolte Taylor (2008). Dr. Taylor's book is a personal account of the experience of a stroke, which was a severe arteriovenous malformation (AVM) hemorrhage in the left hemisphere of Dr. Taylor's brain (J. Taylor 2008, 35). In her book, with the clarity of a neuroscientist, Dr. Taylor describes her experiences as the left hemisphere of her brain shut down. She goes on to describe her lengthy nine years of recovery, and the insights she has had as a result of her experience.

The second scholarly book I reference on the topic of brain hemisphericity is *The Master and His Emissary* by British psychiatrist and Johns Hopkins University Hospital researcher Iain McGilchrist (2009). Dr. McGilchrist's book is the result of more than twenty years of study of brain hemisphericity, and his hypotheses about how brain hemisphericity has influenced the development of Western culture. I reference primarily Dr. McGilchrist's studies on brain hemisphere function in this book.

Both Dr. J. Taylor (2008) and Dr. McGilchrist (2009) emphasize that, contrary to the popularly developed hypotheses of the 1970s and 1980s regarding brain hemisphericity, the brain acts as an *integrated whole*. Dr. Taylor (2008) states:

Using non-invasive modern techniques, including functional imaging (fMRI), scientists are now capable of visualizing which specific neurons are engaged in performing a designated function in real time. Because our two hemispheres are so neuronally integrated via the corpus callosum, virtually every cognitive behavior we exhibit involves activity in both hemispheres—they [the brain's hemispheres] simply do it differently. As a result, the world of science supports the idea that the relationship between the two cerebral hemispheres is more appropriately viewed as two complimentary halves of a whole rather than as two individual entities or identities.

It makes sense that having two cerebral hemispheres that process information in uniquely different ways would increase our brain's capacity to experience the world around us and increase our chances of survival as a species. Because our two hemispheres are so adept at weaving together a single seamless perception of the world, it is virtually impossible for us to consciously distinguish between what is going on in our left hemisphere versus our right hemisphere. (29)

Dr. McGilchrist echoes Dr. J. Taylor in his clarity of statement of brain

integration:

When I say that the “left hemisphere does this,” or “the right hemisphere does that,” it should be understood that in any one human brain at any one time both hemispheres will be actively involved....Both hemispheres are involved in almost all mental processes, and certainly in all mental states: information is constantly conveyed between the hemispheres, and may be transmitted in either direction several times a second. What activity shows up on a scan is a function of where the threshold [of sensitivity] is set: if the threshold were set low enough one would see activity just about everywhere in the brain all the time. (McGilchrist 2009, 10)

As far as hemispheres go, there is almost certainly nothing that is confined entirely to one or the other. I want to stress that, because I really do not wish to encourage simplistic dichotomizing. The differences I hope to establish are too nuanced to be encapsulated in a few words or simple concepts, but, I believe, they are nonetheless important for that. (McGilchrist 2009, 11)

In these statements J. Taylor (2008) and McGilchrist (2009) categorically state that the brain operates as an *integrated whole*, rather than with any separated or dualistic impression of the world. Yet, in Dr. McGilchrist's following statements, he suggests the utility of attending to hemispheric difference, in what is other than a rebuttal to his previous statement.

But, *at the level of experience*, the world we know is synthesized from the work of the two cerebral hemispheres, each hemisphere having its own way of understanding the world—its own “take” on it. This synthesis is unlikely to be symmetrical, and the world we actually experience, phenomenologically, at any point in time is determined by *which hemisphere's version of the world ultimately comes to predominate* [emphasis mine]. Though I would resist the simplistic idea of a “(left or right) hemisphere personality” overall, there is evidence...certainly for some kinds of activities, we consistently prefer one hemisphere over the other in ways that may differ between individuals, though over whole populations they tend to cohere. (10)

Nature gave us the dichotomy [of the brain hemispheres] when she split the brain. Working out what it means is not in itself to dichotomize; it only becomes so in the hands of those who interpret the results with Cartesian rigidity. (11)

Here Dr. McGilchrist echoes Dr. J. Taylor, and suggests what the investigation of brain hemisphericity may allow human beings to come to understand about the momentums of hemispheric function *at the level of experience*.

The following tables are incomplete descriptions of hemispheric characteristics, drawn only as reference to hemispheric momentum in this book, rather than any declarative definition of isolated function, from McGilchrist's (2009) and J. Taylor's (2008) texts. As shown in Tables A1 and A2, the left hemisphere has remarkable utility in the development of knowledge.

Table A1

Brain Hemisphericity Characteristics From McGilchrist (2009).

Function	Left hemisphere	Right hemisphere
Attention	Narrow, sharp focus, attention to detail, on what is previously known	Broadly connected, contextual, bonding; vigilant on what is 'out there'
Language	Linguistic precision, language grasping, specific location	Implicit meaning, metaphor, body language, emotional expression
Body	Body parts	Embodied world
Disposition	Mechanical; affinity to with the impersonal	Living systems: more personal
Information	Works with what it knows; concerned with utility; needs certainty, needs to be correct; creates self-consistent virtual world for itself	Open to the unknown and novel; more capable of frame shift and flexibility of thought, able to embrace ambiguity
Connection	More neuronally interconnected with itself	Can work with both left and right hemisphere modalities, greater degree of myelination (enabling easy connection with other parts of brain).
Reasoning	Linear, sequential argumentation, explicit meaning	Deductive, mathematical, problem solving
Emotion	Interprets emotion from lower part of face; attends to mouth; specializes in superficial social emotions	Identifies and interprets emotional expression quickly; attends to subtle information from eyes
Music	Metrical rhythms	Relationality, context; melody, timbre, pitch; <i>harmony</i>
Self	Detached from self, seat of conscious self-awareness, expression of the self through the rational will	Self-concept: develops earliest, unified sense of self, self-awareness, humor; pays attention to Other

Note: Data adapted from McGilchrist (2009, 32–93). Author's table.

Table A2

Brain Hemisphericity Characteristics From Dr. Jill Bolte Taylor (2008)

Function	Left hemisphere	Right hemisphere
Processing	Linear and methodical, strings things together in sequence, focus on individual bits of data, hierarchical, comparative	Parallel; master collage of the moment
Time	Sequential: past, present, future	Only the present moment, spontaneous, carefree; everything and everyone connected as <i>one</i>
Context	Breaks things into parts, patterned responses to incoming stimulation, pattern recognition	Big picture
Language	Defines, categorizes things, explains through story, sense of authority over academic details, self-talk, thinks in language, semantic information in sentences, word meaning	Non-verbal, subtle cues, tone of voice, facial expression, congruity
Self	I am [myself], home of ego center	I am everything
Music	Scales, staff notation, fingering	Performance, improvisation, playing by ear
Body	Body boundaries in space	Orientation of body <i>in</i> space

Note: Data adapted from J. Taylor (2008, 29–35). Author's table.

It continues to demonstrate capability in discrete analysis of data, and strength in precision and focus. A weakness of the left hemisphere is that it has a tendency to find exclusive validity only in its own capabilities. The right hemisphere opens to metaphor, context, and relationality in the development of wisdom. It works in the realm of intuition and the present moment. A weakness of the right hemisphere is that without the focus and structure of the left hemisphere, one wouldn't get much

done. It is when these two hemispheres are *consciously integrated*, and each is available for their relative strengths, one then has the greatest freedom to attend in harmony with the world, without falling into the weaknesses of either hemisphere.

With this basic understanding of McGilchrist's (2009) and J. Taylor's (2008) findings about left and right brain hemisphericity, one can use this information to better understand the rationale of referring to the development of knowledge with the left hemisphere, and wisdom with the right hemisphere, at the experiential level. Though of course, at a basic level *both* hemispheres are involved in both ways of attending in the world. The nondominant hemisphere in a particular mode (e.g., knowledge or wisdom) just doesn't "switch off"; there is participation by the nondominant hemisphere, but at a reduced level (McGilchrist 2009, 93). In the cultivation of functional transparency of the self, one engages *experientially* in concurrent and non-overlapping hemispheric ways of attending and understanding (Marks-Tarlow 2012, 225) beyond knowledge, in uncovering and inhabiting resonance and harmony with the self-organizing natural vibratory organic patterns of the cosmos.

When I refer to brain hemisphericity in this book, the reader is invited to refer to these tables for greater context. I further invite the reader to directly consult the McGilchrist (2009) and J. Taylor (2008) texts for explorations of brain hemisphericity that are beyond the scope of this book.

Counterarguments Referring to Brain Hemisphericity

In an incomplete and cursory mention of counterarguments in the brain hemisphericity controversy, I refer to two articles: "Why Right-Brain Teaching Is

Half-Witted: a Critique of the Misapplication of Neuroscience to Education” (Lindell and Kidd 2011) by Annukka K. Lindell of the School of Psychological Science, La Trobe University, and Evan Kidd, of the School of Psychological Sciences at the University of Manchester; and that of neurobiologist William H. Calvin (1983) in Chapter 10 of his book *The Throwing Madonna*, entitled: *Left Brain, Right Brain: Science or the New Phrenology?* (102–8).

In both of these articles the argument seems to focus on different vectors in reference to brain hemisphericity that those specifically indicated by J. Taylor (2008) and McGilchrist (2009). Rightly, or better said, more explicitly, Lindell and Kidd (2011) as well as Calvin (1983) all seek to disprove laterality as a “myth” by arguing all activity is always present in both hemispheres. They argue the dated broad-brush premise that “analysis” and “science” reside exclusively in the left hemisphere, and “creativity” exclusively resides in the right hemisphere is “nonsense.” Lindell and Kidd (2011, 122) further argue against brain-hemisphericity, by calling it “pseudo-science” and “the dangerous appeal of neuro-marketing.” Calvin (1983) cites concerns involving the scarcity of research funds going towards a “gimmick of borrowing a quasi-scientific foundation” for further research into brain hemisphericity (107).

First, it is difficult to argue with Jill Bolte-Taylor’s (2008) personal experience of hemispheric shut-down in her explicit report of her left hemisphere shutting down, and the resultant experiential perceptual shifts during her AVM stroke. Next, both Taylor and McGilchrist (2009) are quite explicit about the point that all functions of the brain are present in both hemispheres at all times. J.

Taylor (2008) and McGilchrist (2009) specifically refer to the evolved *experiential* components of hemispheric functions (as shown in the tables above) that are quite different from the dated broad-brush ideas of brain hemispheric function espoused in the 1970s and 1980s. McGilchrist (2009, 10) refers to where the detection threshold of brain activity in present-day instrumentation can be set to appropriately see experiential hemispheric function.

Of course, in 1983, Calvin did not have access to the advanced technology and sophisticated instruments that are available at present for measuring and displaying activity in the brain, but one would imagine that Lindell and Kidd, as neuro-scientists in 2011, *do* have access to the same advanced technology that J. Taylor (2008) and McGilchrist (2009) reference. Lindell and Kidd (2011) make no mention in their argument of instrumentation use protocols in their article. Yet the arguments of Lindell and Kidd are quite similar to that of Calvin (1983), in focusing on scarcity of resources, of less-than-precise science, and “strict dichotomizing [of] brain function [as] problematic” (Lindell and Kidd 2011, 123). Their arguments are, in the modes that J. Taylor (2008) or McGilchrist (2009) suggest (in the tables above), curiously reminiscent of a left-hemisphere dominant and habitual style of attending, where certain focal elements of argumentation tend to be self-validating, particularly without the function of the right-hemisphere style of attending to offer more than a simplistic black-and-white context.

As shown above, neither J. Taylor (2008) or McGilchrist (2009) argue that any brain function is at all exclusive to a particular hemisphere. Marks-Tarlow

(2012) speaks specifically about the heightened utility of engaging in “non-overlapping realms of understanding” (225) in being in the world.

It is beyond the scope of this book to offer more than an incomplete and cursory glimpse into these counterarguments, yet one looks forward to the productive engagements of the developing and broadening context of understanding that both sides can bring to this controversy.

Appendix B: Glossary: Chinese Characters and Translations

Traditional Chinese characters are a pictographic representation of enfolded meaning. Some characters have migrated from the original pictographic meaning, and are used phonetically. Being that they are not alphabetic in nature, which means that words are constructed of multiple letters in a linear sequence, each Chinese character represents a word/concept in the language. As I have stated in the text, the meanings in many of these words is *paranomasic* (Ames 2008). In other words, Chinese characters many times have multiply embedded meanings. The challenge to translators is to find their way through these meanings, that show the best offering of meaning in the overall meaning of the text, and the orientation and opinion of the translator.¹⁹⁵ It is beyond the scope of this book to venture into the history of development of Chinese characters, or into the inherent concerns in translation theory.

In the interest of study of Chinese characters and their enfolded meanings, I thought readers would benefit by understanding the schematic structures of a limited number of specific characters I felt relevant to this book. The first display is of the character in its whole form. Because Chinese characters are pictorial, I explore the components of each character in a quadrant-like way. Each character has its own structural makeup. I proceed in a left to right, top to bottom examination, which is not unlike the order of brush-strokes needed to write the character. Where specifically relevant, I refer to sources that use these characters,

¹⁹⁵ See the introduction of Chapter 6 for my thoughts on translation theory.

so the reader may find additional information regarding the multiple embedded meanings in these characters that gives a richness to understanding of the text in which they are found.

The characters are arranged alphabetically by the Pinyin romanization system of each character. Diacritical marks to the Pinyin romanization are added to imply which of the four tones is used in the pronunciation of the character. First, or high-pitched and even tone is $\bar{\quad}$, second, or ascending tone is $\acute{\quad}$, third, or a “dipping” tone is $\check{\quad}$, and fourth, or a descending tone is $\grave{\quad}$.

Of particular mention is the remarkable resource afforded by *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998). This dictionary is not only available as a printed book but is available in on the internet at Zhongwen.com. The structure of the book and website allows the researcher to trace the structures and implicit meanings of characters. One of the most enjoyable activities in writing this book has been the uncovering of the very earthy and natural organic meanings enfolded in Chinese characters.

Chinese Characters

本 bēn: root (of tree; a tree rooted in the ground; Jin 2010, 359)

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 232–33)
 - a. Tree with line emphasizing base. Stem, root, basis, origin, principal, capital, book, edition, personal, own, this, a measure-word for books
 - i. Top character: mù 木: words: pictograph of tree, wood.
 1. Inside character: yī 一: Ideograph representing one. In composition can represent the horizon, a bar or line, or heaven.

2. *Chinese Etymology Dictionary* (Sears 2011)

The root of a plant / the root / the origin / the source / the basis / the foundation / original / a book / a copy / capital (in business) / our / this / the present / according to / based on / the beginning / the starting point

3. *Chinese Text Project* (Sturgeon 2013)

root, origin, source; basis

4. *Nciku Dictionary* (2013)

- a. root, tree root, basis; put the cart before the horse, capital; lose money in business, book, edition, hand-written copy, master copy script, main, original, one's own, some books
 - i. Top character: mù 木: tree, wood, numb, stupid
 - 1. Internal character: yī 一: one

5. *Zhending Dictionary* (Denisowski 2013)

roots or stems of plants; origin; source; this; the current; root; foundation; basis; (a measure word)

誠 chéng: truthful, honest, loyal.

As quoted in the *Doctrine of the Mean*, in Gardner (2007, 124).

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 140)

- a. words that become reality
 - i. Left character: yán 言: words: crime of the mouth, word, speak
 - 1. Top character: qiān (root 50, var.79; Harbaugh 1998, 154): offend the law above crime
 - 2. Bottom character: kǒu 口: mouth
 - ii. Right character: chéng 成: lance, become, complete accomplish
 - 3. Inside character: dīng 丁: pictograph of a nail

2. *Chinese Etymology Dictionary* (Sears 2011)

sincere / honest / cordial / sincerity / true / real / truly / indeed / actually

3. *Chinese Text Project* (Sturgeon 2013)

- a. sincere, honest, true, real
 - i. Left character: yán 言: words, speech, speak, say

ii. Right character: chéng 成: completed, finished, fixed

4. *Nciku Dictionary* (2013)

honest, sincere, really

5. *Zhending Dictionary* (Denisowski 2013)

honest; sincere

法 fǎ: law

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 126)

a. law: as water goes law

i. Left character: 氵 as water 水 shuǐ: water

ii. Right character: 去 qù:

1. Top character: person 大 dà, altered to resemble 土 tǔ; (an object rising through the earth)

2. Bottom character: 厶 sī; lecurved line suggesting lack of straightforwardness: selfish.

2. *Chinese Etymology Dictionary* (Sears 2011)

an institution / law / regulations / rules / the statutes / legal / methods / ways of doing things / to pattern or model after / to emulate / (Buddhism) the “way”—doctrines, etc. / tricks / magic arts / expert or standard (calligraphy, painting, etc.) / penalty / punishment /

3. *Chinese Text Project* (Sturgeon 2013)

a. law, rule, regulation: literally “water depart earth secret”

i. Left character: 氵 abbreviated form of 水 shuǐ: water

ii. Right character: 去 qù depart (homonym of 曲 qū: song, also seems to be the top of right character in 禮)

1. Top character: 土 tǔ: soil, earth

a. Top character: 十 shí: tenth, complete, perfect

b. Bottom character: 一 yī: one

2. Bottom character: 厶 sī: private, secret

4. *Nciku Dictionary* (2013)

law, method, model, Buddhism, magic

- a. Left character: 氵 abbreviated form of 水 shuǐ: water
- b. Right character: 去 qù: go, get rid of, be apart, send, past
 - 1. Top character: 土 tǔ: soil, land, local, folk
 - 2. Bottom character: 厶 sī: undefined

罰 fá: punish

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 194)
 - a. punish for insults and threats with knife; penalize, fine.
 - i. Left character: 罍 li: words against person caught in web of misdeeds: scold
 1. Top character: 网 wǎng: mis-deeds
 - a. Top character: 冃 mǐ: covering
 - b. Bottom character: 乂 yì: interwoven ropes
 2. Bottom character: 言 yán: crime of the mouth
 - a. Top character: 讠 qiān: crime
 - b. Top character: 干: pictograph of shield or pestle; offend, attack
 3. Bottom character: 口 kou: mouth²
 - ii. Right character: 刀 dāo: pictograph of knife
2. *Chinese Etymology Dictionary* (Sears 2011)

no entry
3. *Chinese Text Project* (Sturgeon 2013)
 - a. penalty, fine, punish, penalize
 - i. Top character: 网 wǎng: net, network
 - ii. Bottom character: 討 taǒ: to discuss; ask for, beg; demand; dun; marry
 1. Left character: 言 yán: words, speech; speak, say
 2. Right character 刀 dāo: pictograph of knife
4. *Nciku Dictionary* (2013)

to punish, penalize, to fine.
5. *Zhendic Dictionary* (Denisowski 2013)

no entry

感應 gǎn yìng: resonance; stimulus-response from the *Huái Nán Zǐ* (淮南子) (Major, et al. 2010, 875; Le Blanc 1985, xii, 8)

感 gǎn: stimulus

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 139)

a. bite the heart

- i. Top character: xián 咸: wound, with the (kǒu 口) mouth. Bite all.
- ii. Bottom character: xīn 心: heart

2. *Chinese Etymology*

to find, to feel, to sense, to perceive, to respond to, to affect, move, or touch, feeling, sensation, emotion, to be grateful.

3. *Chinese Text Project* (Sturgeon 2013)

a. feel, perceive, emotion

- i. Top character: xián 咸: together, all, completely, united
- ii. Bottom character: xīn 心: heart-mind

4. *Nciku Dictionary* (2013)

a. feel, move, moving, sense

- i. Top character: xián 咸: salted
 1. Top character: wù 戊: fifth of ten heavenly stems
 2. Middle character: yī 一: one
 3. Bottom character: kǒu 口: mouth
- ii. Bottom character: xīn 心: heart-mind

5. *Zhendic Dictionary* (Denisowski 2013)

to feel; to move; to touch; to affect

格 gé: to pattern or to investigate (as in the *Great Learning* or *Dà xué* 大學; e.g., Gardner 2007). Gè 格 is literally translated as “the pattern of wood that speaks.”

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 22)

mù, wood: 木, with gè, pattern: 各 which derives from 人 ren (person) with mouth 口 kou.

2. *Chinese Etymology Dictionary* (Sears 2011)

to correct / to adjust or regulate / to reach / to come or go to / to influence / to resist / to attack / fight / to obstruct / to block / to study thoroughly / to search to the very source / to investigate / a standard / a form / a rule / a pattern / a style / a frame / a trellis / squares formed by crossed lines

3. *Chinese Text Project* (Sturgeon 2013)

- a. pattern, standard, form, style
 - i. Left character: 木 mù: tree, wood, lumber, wooden
 - ii. Right character: 各 gè: each, all
 - 1. Top character: 夂 zhǐ: go
 - 2. Bottom character: 口: gǒu: mouth, entrance, gate

4. *Nciku Dictionary* (2013)

- a. check, standard, character
 - i. Left character: 木 mù; wood, tree
 - ii. Right character: 各 gè: each

5. *Zhending Dictionary* (Denisowski 2013)

frame, rule

- a. pattern, standard, form, style
 - i. Left character: 木 mù: tree, wood, lumber, wooden
 - ii. rRght character: 各 gè: each, all
 - 1. Top character: 夂 zhǐ: go
 - 2. Bottom character: 口: gǒu: mouth, entrance, gate

觀 guān: to observe: as a stork (screeching bird) sees (eye above standing person). This character is title of *Yì Jīng* 易經 Hexagram 20 觀 (e.g., Y. Wu 1998, 2012; Wilhelm and Baynes 1967)

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 350)

- a. a stork: guàn 鶩, sees jiàn 見
 - i. Left character: guàn 鶩: stork
 - 1. Top character: huán 隹: bird with horn-like (an abbreviated form of cǎo 艸: [multiple sprouts, usually referring to plants] feathers, a type of owl
 - 2. Middle character: xuān 𠂔 (two mouths): to cry out
 - 3. Bottom character: zhuī 隹: pictograph of short-tailed bird
 - ii. Right character: jiàn 見: sees: eye above a standing person
 - 1. Top character: mù 目: pictograph of eye
 - 2. Bottom character: rén 儿: pictograph of human legs; person

2. *Chinese Etymology Dictionary* (Sears 2011)

to see / to observe / to behold / to view / to take a view of / to look / to inspect / sights / views / to display / a point of view / a conception

3. *Chinese Text Project* (Sturgeon 2013)

- a. see, observe, view; appearance
 - i. Left character: guàn 鶩: heron, small cup
 - ii. Right character: jiàn 見: see, observe, behold; perceive
 - 1. Top character: mù 目: eye, look, see, division, topic
 - 2. Bottom character: ér 儿: son, child

4. *Nciku Dictionary* (2013)

look at, watch, observe, sight, view, concept, outlook, idea

5. *Zhendic Dictionary* (Denisowski 2013)

to look at; to watch; to observe; to behold

和 (or alternate) 龢 hé: harmony, calm, peaceful

1. *Chinese Characters: A Genealogy and Dictionary* “Hé 和” (Harbaugh 1998, 282; alternate is “Hé 龢”)

- a. Left character: 禾 hé: pictograph of grain-bearing plant. Grain on stalk.
- b. Right character: 口 kǒu: mouth.
- c. Alternate left character: 龠 yuè: holes 口 kǒu arranged in pan-pipe 龠 lún. (Harbaugh 1998, 294)
 - i. Internal character: 侖 lún: gather 亼 jí, documents 冊 cè
 1. Top character: jí 亼: three lines, many, gather
 2. Bottom character: 冊 cè: pictograph of an ancient book composed of bamboo strips tied together.
- d. Alternate right character: 禾 hé: pictograph of grain-bearing plant. Grain on stalk.

2. *Chinese Etymology Dictionary* (Sears 2011)

harmony / harmonious / peace / peaceful / to be affable / the sum or aggregate / alternate is: 龢

3. *Chinese Text Project* (Sturgeon 2013)

- a. hé 和: harmony, peace; peaceful, calm
 - i. Left character: 禾 hé: grain still on stalk; rice plant
 - ii. Right character: 口 kǒu: mouth; open end; entrance, gate
- b. (alternate) hé 龢: in harmony; calm, peaceful
 - i. Left character: 龠 yuè: flute; pipe, ancient measure
 - ii. Right character: 禾 hé: grain still on stalk; rice plant

4. *Nciku Dictionary* (2013)

- a. to join in the singing
 - i. Left character: 禾 hé: see
 - ii. Right character: 口 kǒu: mouth

5. *Zhending Dictionary* (Denisowski 2013)

龢 hé : and; together with; peace; harmony; union

慧 huì: intelligent; also “Well kept heart/mind.” Used with 智 zhì, 智慧 to indicate “wisdom” (Yang 2008, 64) . The term can literally mean; “holding a bundle of plants over the heart/mind while arrow mouth speaks.”

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 213)

- a. Well-kept heart/mind. Intelligent.
 - i. Top character: 彗 huì: hand holding a bunch of plants
 - 1. Top character: 丰 fēng (doubled): abundance of plants
 - 2. Bottom character: 又 yòu: pictograph of the right hand
 - ii. Bottom character: 心 xīn: heart/mind.

2. *Chinese Etymology Dictionary* (Sears 2011)

intelligent / bright / wise

3. *Chinese Text Project* (Sturgeon 2013)

- a. bright, intelligent; intelligence
 - i. Top character: 彗 huì: broomstick; comet
 - ii. Bottom character: 心 xīn: heart/mind

4. *Nciku Dictionary* (2013)

intelligent, bright, clever

5. *Zhentic Dictionary* (Denisowski 2013)

intelligent

盥 jìn: to exhaust: a pen burned in a fire in a bowl (*Mencius*, Book 7, part A; e.g., Lau 2003)

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 40)

- a. Only ashes in a plate
 - i. Top character: 聿 yù: pen or stick
 - ii. Middle character: 火 huǒ: pictograph of rising flames
 - iii. Bottom character: 皿 mǐn: pictograph of a serving vessel, plate, saucer.

2. *Chinese Etymology Dictionary* (Sears 2011)

to exhaust / to use up / to put to the best use / to complete / to finish / to accomplish / all / entirely / totally / completely / wholly / the utmost

3. *Chinese Text Project* (Sturgeon 2013)

exhaust, use up; deplete

4. *Nciku Dictionary* (2013)

exhaust, go to extremes, use...to the full, strive to accomplish, complete

5. *Zhendic Dictionary* (Denisowski 2013)

to use up; to exhaust; to end; to finish; to the utmost; exhausted; finished; to the limit

敬 jìng: respectful, serious

What Master Cheng said was no more than the word “seriousness” (jìng 敬). This was the reason why he said, “Seriousness without fail is the way to attain equilibrium,” and “For entering the Way there is nothing better than seriousness. No one can ever extend knowledge [complete wisdom] to the utmost [qiong?] without depending on seriousness,” and again, “Self-cultivation requires seriousness; the pursuit of learning depends on the extension of knowledge [completion of Wisdom]” (Chan 1973, 601).

Literally to “strike (with a held stick) frivolousness or carelessness.”

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 63)

a. Strike and self-restraint (an ancient character), respect, respectfully request

i. Left character: gǒu 苟: plant with carelessness

1. Top character: cǎo 艸: plant: multiple sprouts

2. Bottom character: jù 句: mouth stopped/entangled

ii. Right character: pū 攴: hand holding a stick

3. Top character: bǔ 卜: pictograph of cracks in tortoise shells. In composition can represent a stick. Foretell, divine.

4. Bottom character: yòu 又: pictograph of the right hand.

2. *Chinese Etymology Dictionary* (Sears 2011)

to respect / to revere / to honor / to esteem / respect / respectfully / to present / to offer

3. *Chinese Text Project* (Sturgeon 2013)

- a. exhaust, use up; deplete
 - i. Left character: gǒu 苟: careless, frivolous; illicit; grammatical particle: if, but, if only; surname; grass name
 - 1. Top character: cao 艸: grass
 - 2. Bottom character: jù 句: sentence
 - a. Top-right character: bāo 勹: wrap
 - b. Bottom-left character: kǒu 口: mouth
 - ii. Right character: suī 夂: rap, tap, radical 66; abbreviated form of pū 攴:
 - 1. Top character: 扌 undefined
 - 2. Bottom character: yòu 又: and, also, again, in addition

4. *Nciku Dictionary* (2013)

respect, offer, respectful

5. *Zhending Dictionary* (Denisowski 2013)

to respect; to venerate; to salute; to offer

静 jìng: quietude, tranquility

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 279–80)

- a. Think vividly and pull at truth
 - i. Left character: qīng 青: color of lush growth that burns red
 - 1. Top character: shēng 生: pictograph of a plant rising from ground; grow, to give birth to.
 - 2. Bottom character: dān 丹 (often written as 月): a red mineral, represented by the dot, found in a mine/well (jǐng 井)
 - ii. Right character: zhēng 爭 or 争: hands pulling, struggle, contend, argue, quarrel
 - 1. Top character: piǎo (Harbaugh 1998, 216; root 103, var. 16): from hand above (zhuǎ 爪; pictograph of hand or paw facing down) to hand below (yòu 又: pictograph of right hand)
 - 2. Bottom character: yì (Harbaugh 1998, 16; root 7, var. 1): ideograph suggesting a dragging motion.

2. *Chinese Etymology Dictionary* (Sears 2011)

still / motionless / quietly / calm / tranquility silent / peaceful / harmonious
/ serene / virtuous / chaste

3. *Chinese Text Project* (Sturgeon 2013)

a. quiet, still, motionless; gentle

i. Left character: qīng 青: blue

1. Top character: 𠂇: undefined

2. Bottom character: 冫: undefined

ii. Right character: zhēng 争: dispute, fight, contend, strive

4. *Nciku Dictionary* (2013)

quiet, still, motionless, still, noiseless, peace, calmness, tranquility,
composure

5. *Zhending Dictionary* (Denisowski 2013)

no definition available

静坐 jìng zuò: quiet-sit. “Quiet sitting.” (R.Taylor 1988).

居 jū

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 100)

a. lower body with live

1. Left upper character: shī 尸: pictograph of a person sitting or lying down

2. Right lower character: gǔ 古: retold through ten (shí 十: ideograph indicating the four directions and the center, complete) mouths (kǒu 口).

2. *Chinese Etymology Dictionary* (Sears 2011)

to dwell / to reside / to inhabit / to occupy / an abode / a dwelling / to stay
put / to be at a standstill

3. *Chinese Text Project* (Sturgeon 2013)

a. live, dwell, reside, sit

- i. Left upper character: shī 尸: corpse; to impersonate the dead; to preside; KangXi radical 44
- ii. Right lower character: gǔ 古: old, classic, ancient
 - 1. Top character: shí 十: ten, tenth; complete; perfect
 - 2. Bottom character: kǒu 口: mouth; open end; entrance, gate

4. *Nciku Dictionary* (2013)

live, be, claim, claim the credit, store...up, house

5. *Zhendic Dictionary* (Denisowski 2013)

reside

居敬 jū jìng: abide in reverence

for Zhū Xī, a necessary state of “abiding in reverence,” which was the result of “the correct attitude of mind” (jìng 敬, seriousness or reverence) when attempting to “plumb pattern to the utmost” in quiet sitting. (R. Taylor 1988, 17)

理 Lǐ: organic pattern

lǐ: organic pattern, principle, law

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 288)

- a. to work jade
 - i. Left character: 玉 yù: three pieces of jade strung together (with dot to distinguish this character from 王 wáng, king (as below)
 - 1. Alternate character: 王 wáng: a king: the one who connects heaven, humanity, and earth
 - ii. Right character: 里 lǐ: field, earth, hamlet, village, 1/3 of a mile
 - 1. Top character: 田 tián: pictograph of field with irrigation channels
 - 2. Bottom character: 土 tǔ: an object rising through the earth

2. *Chinese Etymology Dictionary* (Sears 2011)

reason / logic / cause / truth / right / righteousness / law / principles / doctrine / theory / science / to arrange / to administer / to govern / to operate / to regulate / to manage / to run / to reply or answer / to respond / texture / grain as in wood, skin, etc.) / name of a religious sect.

3. *Chinese Text Project* (Sturgeon 2013)

a. reason, logic, manage

i. Left character: 王 wáng: king, ruler, surname

1. Top character: 一 yī: one, alone

2. Bottom character: 土 tǔ: soil, earth (related to 王 wáng)

a. Top character: 十 shí: ten

b. Bottom character: 一 yī: one, alone

ii. Right character: 里 lǐ: unit of distance, village, lane

1. Top character: 田 tián: field, arable land, cultivated

2. Bottom character: 土 tǔ: soil, earth (related to 王 wáng)

a. Top character: 十 shí: ten

b. Bottom character: 一 yī: one, alone

4. *Nciku Dictionary* (2013)

texture, reason, natural science, manage

5. *Zhending Dictionary* (Denisowski 2013)

reason; logic; science; inner principle or structure

禮

Lǐ: Rites, Ritual, Propriety

Ritual, ceremony, present (gift): literally: to make connection with the divine through linking the three elements (sun, moon, and stars), with music and song, while offering food (a bowl of bean-curd).

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 213)

a. Left character: 示 shì: to obtain revelations, to show, to teach

i. Top character: 上 shàng: heaven above; (also looks like 二 èr, numeral two)

1. Top character: 一 yī: numeral one

2. Bottom character: 卜 bù: practice divination

- ii. Bottom character: 三 sān: numeral three; the three elements, sun, moon, and stars of heaven above; written vertically to look like 小 xiǎo: (dividing).
 - b. Right character: 豊 lǐ: sacrificial vessel (phonetic)
 - i. Top character: 曲 qū: wood carved in a cup shape (pictograph), also means “to sing a melody.”
 - ii. Bottom character: 豆 dòu: serving container, ceremonial serving dish. (For soybean)
 - 1. Top character: 一 yī: numeral one
 - 2. Middle character: 匚 wéi: enclosure
 - 3. Lower character: legs to support enclosure
2. *Chinese Etymology Dictionary* (Sears 2011)
- reason / logic / cause / truth / right / righteousness / law / principles / doctrine / theory / science / to arrange / to administer / to govern / to operate / to regulate / to manage / to run / to reply or answer / to respond / texture / grain as in wood, skin, etc.) / name of a religious sect.
3. *Chinese Text Project* (Sturgeon 2013)
- a. social custom; manners; courtesy; rites
 - i. Left character 示 shì: meaning cult: abbreviated form of 示
 - ii. Right character: 豊 lǐ; abundant, lush, bountiful, plenty
 - 1. Top character: 曲 qū: crooked, bent; wrong, false
 - 2. Bottom character: 豆 dòu: peas, beans, bean-shaped
4. *Nciku Dictionary* (2013)
- ceremony, courtesy, present (gift)
5. *Zhending Dictionary* (Denisowski 2013)
- gift, propriety, rite

倫 lún: relationship

lún: human relationship; orderly union with members of a group; a person with a bundle of bamboo strips, a group of people gathered together with one common purpose like bamboo strips of an ancient Chinese book.

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 294)
 - a. people (rén 人) in order (lún 倫); reflect on, mediate, orderly
 - i. Left character: rén 亻: human being
 - ii. Right character: lún 侖: gather documents
 1. Top character: jí 亼: gather, union
 2. Bottom character: cè 冊: pictograph of an ancient book composed of bamboo strips tied together.
2. *Chinese Etymology Dictionary* (Sears 2011)

normal relationships among people / comparison / a peer / a match / classification / order / logic / regular / ordinary / to choose / choice
3. Chinese Text Project (Sturgeon 2013)
 - a. normal human relationships
 - i. Left character: rén 亻: abbreviated form of 人 human being, radical No.9
 - ii. Right character: lún 倫: logical reasons, logical order
4. *Zhending Dictionary* (Denisowski 2013)

human relationship

命 mìng: fate

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 136)
 - a. verbal (口 kǒu) decree (令 lìng: to [亼 jí] join a seal [冂 jiè] to a document.)
 - i. Top character: 亼 jí: join
 - ii. Right bottom character: 冂 jié: pictograph of an official seal. Early form shows pictograph of kneeling person.
2. *Chinese Etymology Dictionary* (Sears 2011)

life / a fate / destiny / a lot / the ordinances of Heaven / orders / a command

3. *Chinese Text Project* (Sturgeon 2013)

- a. life, destiny, fate, luck, an order, instruction
 - i. Top character: 亼 jí: to assemble, to gather together
 - 1. Top character: 人 rèn: person
 - 2. Bottom character: 一 yī: one
 - ii. Bottom character: 叩 kòu: knock, ask, bow, kowtow
 - 1. Left character: 口 kǒu: mouth, open end, entrance, gate
 - 2. Right character: 叩 undefined

4. *Nciku Dictionary* (2013)

- a. life, fate, lifespan, order, set
 - i. Top character: 亼 undefined
 - ii. Bottom character: 叩 kòu: knock at door, bow
 - 1. Left character: 口 kǒu: mouth, taste, entrance/exit, edge
 - 2. Right character: 叩 jí: undefined

5. *Zhending Dictionary* (Denisowski 2013)

life; fate

名 míng: name/fame

Name/fame: what is spoken of at sunset/evening, under a crescent moon, the measure of a person (perhaps around a fire after the work of the day, during the evening meal).

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 216)

- a. Mouthed in the dark of evening, to identify, (make) famous, well-known
 - i. Top character: 夕 xī: pictograph of a crescent moon; evening, dusk, setting sun
 - ii. Bottom character: 口 kǒu: pictograph of a mouth

2. *Chinese Etymology Dictionary* (Sears 2011)

a name / a designation / a title / rank / position / honor / fame / renown / reputation / famous / noted / distinguished / renowned / valuable / precious / noble / rare / great / to name / to describe

3. *Chinese Text Project* (Sturgeon 2013)

- a. name, rank, title, position
 - i. Top character: xī 夕: evening, night, dusk; slanted
 - ii. Bottom character: kǒu 口: mouth; open end; entrance, gate

4. *Nciku Dictionary* (2013)

- a. name, reputation, famous
 - i. Top character: xī 夕: sunset, evening
 - ii. Bottom character: kǒu 口: mouth

5. *Zhendic Dictionary* (Denisowski 2013)

name; (measure word for persons); place (e.g., among winners)

氣 qì: energy

energy: rice and steam from rice

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 247)

- a. rice (mǐ 米) disbursed like air (qì 气)
 - i. Top character: qì 气: pictograph of curling clouds
 - ii. Bottom character: mǐ 米: pictograph of grains of rice

2. *Chinese Etymology Dictionary* (Sears 2011)

air / gas / vapor / the atmosphere / breath / spirit / morale / influence / bearing / manner / smells / odors / to be angry / to be indignant / rage / anger / to provoke / to goad / to make angry / to annoy / weather

3. *Chinese Text Project* (Sturgeon 2013)

- a. name, rank, title, position
 - i. Top character: xī 夕: evening, night, dusk; slanted
 - ii. Bottom character: kǒu 口: mouth; open end; entrance, gate

4. *Nciku Dictionary* (2013)

gas, air, breath, mood, smell, manner, anger

5. *Zhending Dictionary* (Denisowski 2013)

gas; air; smell; weather; vital breath; to make angry; to get angry; to be enraged

氣質

qì zhì: Psychophysical “stuff” (Gardner 1986, 77, fn 4)

This can “stuff” can “cover,” or “obscure” (depending on its clarity and density) people’s “bright nature.” (Gardner 1990, 50–51, fn 61)

器

qì: energy

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 189–90)

- a. collection of cooking vessels (clamoring of many mouths) as guarded by a dog (great teeth in mouth with foot with protruding toes).
 - i. Upper character: 𠂔 two mouths:
 1. kǒu 口; mouth
 - ii. Middle character: quǎn 犬: dog;
 2. further, dog as: quǎnchǐ 犬齒 “great teeth”
 - a. left character: quǎn 犬
 - b. right character: chǐ 齒: pictograph of teeth (with zhǐ 止 pictograph of foot with protruding toes)(teeth inside kǒu 口: mouth)
 - iii. Bottom character: 𠂔 two mouths
 1. kǒu 口; mouth

2. *Chinese Etymology Dictionary* (Sears 2011)

- a. an instrument / an implement / a utensil / a tool / a piece of apparatus /
- b. magnanimity / talent / ability / capacity / to think highly of (a person)

3. *Chinese Text Project* (Sturgeon 2013)

- a. receptacle, vessel; instrument
 - i. Top character: kū 哭: weep, cry, wail (howling dog?)
 1. Top character: xuān 𠂔: two mouths: kǒu 口: compositionally related to: lǚ 呂: a musical note

2. Bottom character: quǎn 犬: dog
- ii. Bottom character: xuān 𠂔: two mouths: kǒu 口: compositionally related to: lǚ 吕: a musical note

4. *Nciku Dictionary* (2013)

- a. utensil, musical instrument, organ
 - i. Upper character: 𠂔 undefined
 - ii. Middle character: quǎn 犬: dog
 1. Dog is: dà 大: great, with dot: zhǔ 丩
 - iii. Lower character: 𠂔 undefined

5. *Zhending Dictionary* (Denisowski 2013)

device, tool, utensil

窮

qióng: to exhaust, plumb, delve deeply into

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 179)

- a. bent over (躬 gōng; phonetic element) in a hole (穴 xué).
- b. this suggests being exhausted from excavating.

2. *Chinese Etymology Dictionary* (Sears 2011)

poor / impoverished / destitute / to exhaust / to trace to the very source / distress / affliction / the extreme / the farthest / an end / thoroughly

3. *Chinese Text Project* (Sturgeon 2013)

- a. poor, destitute, impoverished (exhausted)
 - i. Top character: 穴 xué: cave, den, hole.
 - ii. Bottom character: 躬 gōng: body, personally, in person
 1. Left character: 身 shēn: body, trunk, hull
 2. Right character: 弓 gōng: bow, curved, arched

4. *Nciku Dictionary* (2013)

thoroughly, extremely
(this site offers etymology for “simplified” characters only)

5. *Zhending Dictionary* (Denisowski 2013)

exhausted, poor

確 què: to be really certain

so certain [of words] that one can fly high off a cliff (reminiscent of Major Arcana 0, “The Fool” in the English Tarot deck).

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 347–48)

- a. stone, with soaring bird, signifying persistence, certain, reliable, firmly
 - i. Left character: shí or dàn 石: stone, rock
 - 1. Top character: hǎn 厂: cliff piece, cliff dwelling
 - 2. Bottom character: kǒu 口: mouth
 - ii. Right character: hào (see Harbaugh 1998, 347, root 162 var. 35), bird heading into the distance
 - 1. Top character: jǐng 冂: ideograph representing outer limits
 - 2. Bottom character: zhūi 隹: pictograph of bird with short tail

2. *Chinese Etymology Dictionary* (Sears 2011)

sure / certain / secure / real / true / valid / firm / firmly

3. *Chinese Text Project* (Sturgeon 2013)

- a. sure, certain; real, true
 - i. Left character: shí or dàn 石: stone, rock, mineral, radical 112
 - ii. Right character: hè 雀: a bird flying high, ambition

4. *Nciku Dictionary* (2013)

- a. really, firmly
 - i. Left character: dàn 石: stone
 - ii. Right character (simplified): jué 角: role, actor, fight

5. *Zhending Dictionary* (Denisowski 2013)

authenticated, solid, firm, real, true

儒家 Rú Jiā (Confucianism)(e.g., Yao 2000, Chan 1973, Fung 1952)

聲 shēng: Sound, reputation, fame

Hearing a gentleman striking hollowed stone chimes hung from a rack (Harbaugh 1998, 117).

矢 shī: neglect, (Harbaugh 1998, 260–61)

事 shì: phenomena

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 347–48)

- a. scribe with 之 (abbreviated) phonetic. job, occupation, affair, matter, business
 - i. Top character: shǐ 史: hand (yòu 又: pictograph of the right hand) (altered) holding a fountain pen (zhōng 中).
 - ii. Bottom character: zhī 之: possessive “s,” plant (altered) rising from the ground.

2. *Chinese Etymology Dictionary* (Sears 2011)

an affair / a matter / business / a job / an occupation / a task / a service / duties / functions / a subject / to serve / to attend / to manage a business

3. *Chinese Text Project* (Sturgeon 2013)

affair, matter, business; to serve; accident, incident

4. *Nciku Dictionary* (2013)

- a. thing, accident, trouble, responsibility, job, problem
 - i. Top character: yī 一: one
 - ii. Upper middle character: kǒu 口: mouth
 - iii. Bottom character: jué 丨: undefined

5. *Zhending Dictionary* (Denisowski 2013)

matter; thing; item; work; affair

勢 shì: influence

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 184)

- a. cultivate strength
 - i. Top character: yì 埶: mound being worked
 1. Top left character: liú 壘
 - a. Top character: lù 尪: mushroom
 - i. Top character: tǔ 土 soil, earth

- ii. Bottom character: ér 儿: son, child
- b. Bottom character: tǔ 土 pictograph of object rising through the earth
- 2. Top right character: jǐ 冂: hand holding an object
- ii. Bottom character: lì 力: pictograph of a tendon

2. *Chinese Etymology Dictionary* (Sears 2011)

power, force, influence, a tendency, the natural features, a situation, circumstances, signs, gestures, male genitals

3. *Chinese Text Project* (Sturgeon 2013)

- a. power, force, tendency
 - i. Top character: yì 藝: art
 - 1. Left character: liù 壘: a clod of earth, land
 - a. Top character: lù 尫: mushroom
 - i. Top character: tǔ 土 soil, earth
 - ii. Bottom character: ér 儿: son, child
 - b. Bottom character: tǔ 土 pictograph of object rising through the earth
 - 2. Right character: wán 丸: small round object, pellet, pill
 - a. Bottom character: lì 力: power, capability, influence

4. *Zhending Dictionary* (Denisowski 2013)

conditions; influence; tendency

思 sī : thinking, thought, hopes (Jin 2010, 372)

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 184)

- a. think, contemplate, long for, think of, ponder: head with heart
 - i. Top character: xìn 囟, which is a pictograph of a skull with a brain inside, written to look like tiàn 田, field.
 - ii. Bottom character: xīn 心: heart-mind

2. *Chinese Etymology Dictionary* (Sears 2011)

contemplate / to consider / memory / remembrance / to remember / to recall / to think of / to mourn / to grieve / to admire / to pine for / a final particle to sound off an expression

3. *Chinese Text Project* (Sturgeon 2013)

- a. think, consider, ponder; final particle
 - i. Top character: tiàn 田: field, arabale land, cultivated
 - ii. Bottom character: xīn 心: heart-mind, intelligence, soul

4. *Nciku Dictionary* (2013)

- a. think, miss, hope, thought, train of thought
 - i. Top character: tiàn 田: field
 - ii. Bottom character: xīn 心: heart-mind

5. *Zhending Dictionary* (Denisowski 2013)

to think, to consider

骨 曲
骨 豆 tǐ: body, skeleton, system (Needham 1956, 559; Jin 2010; this character, tǐ is found starting on page 358 in its simplified form: 体).

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 213–14)

- a. Left character: gǔ 骨: bones
 - i. Top character: guǎ (root 133, var.1 Harbaugh 1998, 316) pictograph of a skull and vertebrae
 - ii. Bottom character: ròu 肉: pictograph of a carcass cut open. In composition can resemble month: yuè 月 (pictograph of crescent moon).
- b. Right character: 豊 lǐ: sacrificial vessel (phonetic)
 - i. Top character: 曲 qū: wood carved in a cup shape (pictograph), also means “to sing a melody.”
 - ii. Bottom character: 豆 dòu: serving container, ceremonial serving dish. (For soybean)
 - 1. Top character: 一 yī: numeral one
 - 2. Middle character: 匚 wéi: enclosure
 - 3. Lower character: legs to support enclosure

2. *Chinese Etymology Dictionary* (Sears 2011)

the body / shape / form / an entity / a unit / a style / a fashion / a system / substance / essence / theory (as opposed to practice)

3. *Chinese Text Project* (Sturgeon 2013)

body; group, class, body, unit

4. *Zhending Dictionary* (Denisowski 2013)

body; form; style; system

天 tiān: heaven

Heaven, standing person under great sky.

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 123)

- a. the expanse 一 above humans 大.
 - i. Top character: yī 一: Ideograph representing one. In composition can represent the horizon, a bar or line, or heaven.
 - ii. Bottom character: dà 大: Pictograph of a standing person. Big, large, great, grand, greatly.

2. *Chinese Etymology Dictionary* (Sears 2011)

the sky, the heavens, the vault of heavens, the firmament, Nature, God, Heaven, nature, natural, not artificial, a day, seasons, climates, weather, father or husband, something indispensable, necessities

3. *Chinese Text Project* (Sturgeon 2013)

- a. sky, heaven; god, celestial
 - i. Top character: yī 一: one; a, an; alone
 - ii. Bottom character: dà 大: big, great, vast, large, high

4. *Nciku Dictionary* (2013)

- a. sky, day, before dawn, season, autumn, weather, nature, Heaven, overhead
 - i. Top character: yī 一: one
 - ii. Bottom character: dà 大: great, big, important

5. *Zhending Dictionary* (Denisowski 2013)

day; sky; heaven

文 wén: character, pattern (Moran, 1984). The *Hsi-tz'u*, A:3, says

[FúXī 伏羲] looked up to see the patterns (*wén* 文) in the heavens, and looked down to inspect the *lǐ* (理) of the earth. The words “*wen*” and “*lǐ*” are parallel. The terms “*t’ien-wen*” (天文; celestial phenomena) and “*ti-li*” (地理; earthly phenomena) now refer to astronomy and geography, and before the mid-nineteenth century referred to astrology and geomancy....a reminder that these sciences have as their objects not only static phenomena such as constellations, but to a much greater extent dynamic phenomena such as the orbits of planets and shifting courses of rivers. The text probably refers to those kinds of phenomena. So these *wén* [文] and *lǐ* [理] must include patterns experienced through time. (Moran 1984, 119–20)

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 273)

A pictograph of interlocking lines; script, writing, language, culture, refined

2. *Chinese Etymology Dictionary* (Sears 2011)

a composition / an article / language / literature / culture / education / elegant / cultured / polished / suave / civil / polite / urbane / mild / civilian or civil (as opposed to military) / a former monetary unit

3. *Chinese Text Project* (Sturgeon 2013)

a. Literature, culture, writing

i. Top character: 一 tóu: head

ii. Bottom character: 乂 yì: govern, control, manage, nurture

4. *Nciku Dictionary* (2013)

a. writing, written, culture, civilization, astronomy, gentle

i. Top character: 一 tóu: head

ii. Bottom character: 乂 yì: govern, control, manage, nurture

5. *Zhentic Dictionary* (Denisowski 2013)

language, culture, writing, formal, literary

我 wǒ: self

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 252)

a. I, hand holding a halberd. (this suggests an idea of self-protection)

- i. Left character: shǒu 手: pictograph of hand
- ii. Right character: gē 戈: halberd: stake with a horizontal blade.
 - 1. Top character: yī 一: one
 - 2. Bottom character: yì 弋: pictograph of a stake.

2. *Chinese Etymology Dictionary* (Sears 2011)

I / me / my / we / our / us / self

3. *Chinese Text Project* (Sturgeon 2013)

our / us / I / me / we

4. *Nciku Dictionary* (2013)

I / me / we / self

5. *Zhending Dictionary* (Denisowski 2013)

thing, object, matter

物 wù: the 10,000 things [extrapolated to “being”]

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 252)

- a. Left character: 牛 nǐu: ox
- b. Right character: 勿 wù: pictograph with banners on a pole used to direct troops.

2. *Chinese Etymology Dictionary* (Sears 2011)

a composition / an article / language / literature / culture / education / elegant / cultured / polished / suave / civil / polite / urbane / mild / civilian or civil (as opposed to military) / a former monetary unit

3. *Chinese Text Project* (Sturgeon 2013)

- a. thing, subject, creature
 - i. Left character: 牛 nǐu: cow, ox, bull
 - ii. Right character: 勿 wù: must not, do not, without, never
 - 1. External character: 勹 bāo: wrap

4. *Nciku Dictionary* (2013)

- a. thing, produce, creature, matter, property, the outside world (10,000 things)
 - i. Left character: 𠂇 nǐu: undefined
 - ii. Right character: 勿 wù: not
 - 1. External character: 勹 bāo: undefined
 - 2. Internal character: 勹 : undefined

5. *Zhending Dictionary* (Denisowski 2013)

thing; object; matter

性 xìng: nature

one's heart-mind, growing from birth

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 210)

- a. One's heart 心 from birth 生, nature, disposition, sexual relations
 - i. Left character: 心 xīn: heart-mind
 - ii. Right character: 生 shēng: pictograph of a plant rising from ground (土), grow, give birth to, bear, produce, have a child

2. *Chinese Etymology Dictionary* (Sears 2011)

nature, natural property, disposition, temper, a quality or property, sex

3. *Chinese Text Project* (Sturgeon 2013)

- a. nature, character, sex
 - i. Left character: 忄 xīn: an abbreviated form of 心, heart-mind, radical number 61.
 - ii. Right character: 生 shēng: life, living; birth

4. *Nciku Dictionary* (2013)

- a. character, moral character, function, gender, sex, reliability
 - i. Left character: 忄 xīn: undefined
 - ii. Right character: 生 shēng: give birth to, grow, live, get, light, life,

5. *Zhending Dictionary* (Denisowski 2013)

sex, nature, surname, a suffix corresponding to -ness or -ity

修 xiū: “cultivate”

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 82)

- a. hair with person holding a stick crossing a stream. Adorn, decorate, fix, repair, study
 - i. Top character: yōu 攸: person (rén 人) holding a stick (pū 攴: hand yòu 又 pictograph of the right hand, holding a stick: bǔ 卜: and crossing a stream: shuǐ 水: pictograph of streams flowing together).
 - ii. Bottom character: shān 彡: pictograph of hairs or fine feathers. Also used to indicate markings.

2. *Chinese Etymology Dictionary* (Sears 2011)

to repair / to mend / to adorn / to decorate / to construct / to build / long / slender / to prune / to cut / to sharpen / to trim / to study / to cultivate / to write / to compile / to edit

3. *Chinese Text Project*

study, repair, cultivate

4. *Nciku Dictionary* (2013)

decorate, mend, study, build, trim

5. *Zhending Dictionary* (Denisowski 2013)

to decorate; to embellish; to repair; to build; to study; to write; to cultivate

虛 xū: emptiness

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 82)

- a. Tiger hill empty unoccupied, false, unreal
 - i. Top character: hū 虍: pictograph of a tiger’s striped fur
 - ii. Bottom character: qū 丘: persons back to back (běi 北)

2. *Chinese Etymology Dictionary* (Sears 2011)

empty / hollow / void / unoccupied / unreal / false / deceptive / unfounded / groundless / weak / feeble / abstract / shapeless / alternate 虛

3. *Chinese Text Project*

false, worthless, empty, hollow

4. *Nciku Dictionary* (2013)

empty, timid, false, modest, weak; in vain

5. *Zhending Dictionary* (Denisowski 2013)

devoid of content; void, false, empty, vain

易 yì: change

stylized pictograph of a lizard; in human action, with appropriateness

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 350)

- a. pictograph of a lizard, head resembling 日 and legs resembling 勿.
 - i. Top character: 日 rì: sun, day
 - ii. Bottom character: 勿 wù: pictograph with banners on a pole used to direct troops.

2. *Chinese Etymology Dictionary* (Sears 2011)

to exchange / to barter / to change (places, jobs, owners, etc.) / easy / amiable / lenient / the *Book of Changes*

3. *Chinese Text Project* (Sturgeon 2013)

- a. change, easy
 - i. Top character: 日 rì: sun, day
 - ii. Bottom character: 勿 wù: not

4. *Nciku Dictionary* (2013)

- i. Top character: 日 rì: sun, day
- ii. Bottom character: 勿 wù: not
 1. External character: 丿 bāo: undefined
 2. Internal character: ㇀ : undefined

5. *Zhending Dictionary* (Denisowski 2013)

change, easy, simple

意 yì: thought: to stand and let the sun into your heart-mind, or to open the sound of the heart-mind

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 194)

- a. sound from the heart-mind; meaning, idea, intention
 - i. Top character: yīn 音: speak (yán 言) altered with (yī 一 “one”) representing sound. Literally “one speak”
 - ii. Bottom character: xīn 心: pictograph of a heart. Heart, mind, feelings, center, middle

2. *Chinese Etymology Dictionary* (Sears 2011)

a thought / an idea / sentiments / intention / inclination / expectations / meaning / a hint / suggestion

3. *Chinese Text Project*

- a. thought, idea, opinion, think
 - i. Top character: yīn 音: sound, tone, pitch, pronunciation
 - 1. Top character: lì 立: stand; let stand; establish, set
 - 2. Bottom character: rì 日: sun; day; daytime.
 - ii. Bottom character: xīn 心: heart; mind, intelligence; soul

4. *Nciku Dictionary* (2013)

- a. meaning, wish, intention, expect
 - i. Top character: yīn 音: sound, news, syllable
 - 1. Top character: lì 立: stand, stand up, make contributions
 - 2. Bottom character: rì 日: sun
 - ii. Bottom character: xīn 心: heart, mind, attentively, center

5. *Zhending Dictionary* (Denisowski 2013)

idea, meaning, wish, desire

應 yìng: response

Response: humans responding like birds flying together from a high cliff with heart.

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 348)
 - a. heart (xīn 心) of birds flying together
 - i. Top character yàn 雁: Birds that fly in (inverted 人) shape from home on cliffs: hǎn 厂
 - ii. Middle character left: ren 人: pictograph of a human
 - iii. Middle character right: zhūi 隹: pictograph of bird with short tail
 - iv. Bottom character: xīn 心: heart-mind
2. *Chinese Etymology Dictionary* (Sears 2011)

to respond to / to answer / to echo / to react to / to comply with / to grant / to deal with / to cope with / to assent to
3. *Chinese Text Project* (Sturgeon 2013)

should, ought to, must
4. *Nciku Dictionary* (2013)
 - a. answer, respond to, comply with, handle, correspond to, answer, agree, should, agree, promise, accept
 - i. Top character: guǎng 广: broad, numerous
 - ii. Bottom character: xīn 心: heart-mind
5. *Zhending Dictionary* (Denisowski 2013)

ought

韻

yùn: music, charm, rhyme; sound (yīn 音) that is round (yuán)

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 333–34)
 - a. sound that is round
 - i. Left character: yīn 音: speak (yán 言) altered with (yī 一 “one”) representing sound. Literally “one speak”
 - ii. Right character: yuán 員: shell (bèi 貝) with (kǒu 口 “mouth”). Objects, round, member.
2. *Chinese Etymology Dictionary* (Sears 2011)

rhymes / harmony of sound / refined / sophisticated / polished / elegant / vowels

3. *Chinese Text Project* (Sturgeon 2013)

a. rhyme, vowel

- i. Left character: yīn 音: sound, tone, pitch, pronunciation
 - 1. Top character: lì 立: stand; let stand; establish, set
 - 2. Bottom character: rì 日: sun; day; daytime.
- ii. Right character: yuán 員: member: personnel, staff member
 - 1. Top character: kǒu 口: mouth
 - 2. Bottom character: bèi 貝: sea shell; money, currency

4. *Nciku Dictionary* (2013)

a. music, charm, rhyme

- i. Left character: yīn 音: sound, news, syllable
 - 1. Top character: lì 立: stand, stand up, make contributions
 - 2. Bottom character: rì 日: sun
- ii. Right character: yūn 勻: even, even...out, apportion

5. *Zhending Dictionary* (Denisowski 2013)

rhyme

則 zé: principle, law

Principle, law, standard, rule of existence. From Ode 260 in *She King* or *Book of Odes* (Legge 1893, 541) as translated in *Sources of Chinese Tradition, Volume 1*, (de Bary 1999, 690): “All things under Heaven can be understood by their principle....Everything must have its principle.”

“In the term *Lǐ* 理 [organic pattern], the reference is to the fact that *every event and thing has each its own rule of existence*” (*shì shì wú wú gè yǒu zé*; 事事物物各有則). (Needham 1956, 559; Bruce 1922, 3)

Needham (1956, 559) suggests

that the ancient writing of the character on bones and bronzes shows a cauldron and a knife—in other words, the very act of incising codes of laws on ritual cauldrons.

“The character’s radical should have continued to be that for cauldron (Radical 206)(dīng 鼎), but it was corrupted into that for cowry-shell (Radical 154)(bèi 貝).” (Needham 1956, 559)

So, according to Needham (1956), the word should have been 鼎 刂, instead of 則.

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 334)
 - shell money cut in standard pieces; law, rule
2. *Chinese Etymology Dictionary* (Sears 2011)
 - a law / a rule / a regulation / a standard / a norm / a criterion / a particle indicating consequence (usually used after a supposition) or a reason / a numerary particle used before news reports, advertisements, and so forth / but / however / to imitate / to follow
3. *Chinese Text Project* (Sturgeon 2013)
 - a. Left character 貝 bèi: seashell, money, currency
 - b. Right character 刂 or 刀 dāo: knife, to cut
4. *Nciku Dictionary* (2013)
 - a. standard, rule, piece
 - i. Left character: 貝 : bèi: shellfish
 - ii. Right character 刂 or 刀 : knife or blade
5. *Zhending Dictionary* (Denisowski 2013)
 - (expresses contrast with a previous sentence or clause); standard, norm, rule, to imitate, to follow, then, principle

正 zhēng:

To rectify, to straighten toes and feet.

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 257)
 - a. stop at the line, proper, right, straight
 - i. Top of character: 一 yī: one
 - ii. Bottom of character: 止 zhǐ: pictograph of foot with protruding toes

2. *Chinese Etymology Dictionary* (Sears 2011)

contaminated / straightforward and unbending / honest and virtuous / the person in charge / the person in command / the principal (as against the secondary) / to mete out punishment for a criminal / original (texts, etc.) / exactly / just / right / positively / main / principal / sharp / punctually / just / unbiased

3. *Chinese Text Project* (Sturgeon 2013)

- a. right, proper, correct
 - i. Top of character: 一 yī: one
 - ii. Bottom of character: 止 zhǐ: stop, halt, desist, detain

4. *Nciku Dictionary* (2013)

- a. straight, straighten, main, right, upright, pure, regular, positive, put right
 - i. Top of character: 一 yī: one
 - i. Bottom of character: 止 zhǐ: stop, end

5. *Zhending Dictionary* (Denisowski 2013)

just (right), main, upright, straight, correct, principle

知 zhī: knowledge, wisdom

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 105–6)

- a. Arrow-like mouth
 - i. Left character: 矢 shǐ: enter, with marks for arrow head and flights
 - ii. Right character: 口 kǒu: pictograph of mouth, opening, mouthful

2. *Chinese Etymology Dictionary* (Sears 2011)

control / to operate / to direct / to wait on

3. *Chinese Text Project* (Sturgeon 2013)

- a. know, perceive, comprehend
 - i. Left character: 矢 shǐ: arrow, dart, vow, swear
 - ii. Right character: 口 kǒu: mouth, open end, entrance, gate

4. *Nciku Dictionary* (2013)

- a. know, inform, knowledge

- i. Left character: 矢 shī: arrow
- ii. Right character: 口 kǒu: mouth

5. *Zhending Dictionary* (Denisowski 2013)

to know; to be aware

智 zhì: wise, wisdom, resourcefulness, wit

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 106)

- a. wisdom, intelligence
 - i. Top character the same as zhī 知
 - 1. Left character: 矢 shī: enter with marks for arrow head and flights
 - 2. Right character: 口 kǒu: pictograph of mouth
 - ii. Bottom character: 曰 yuē: mouth 口 kǒu, exhaling: to say
(e.g., 子曰: “Confucius says”)

2. *Chinese Etymology Dictionary* (Sears 2011)

talented / capable / intelligent / clever / wise / wisdom / knowledge / wit /
prudence

3. *Chinese Text Project* (Sturgeon 2013)

- a. wisdom, intellect
 - i. Top character: zhī 知: know perceive comprehend
 - 1. Left character: 矢 shī: arrow, dart; vow, swear
 - 2. Right character: 口 kǒu: mouth; open end; entrance, gate
 - ii. Bottom character: 日 rì: sun; day; daytime

4. *Zhending Dictionary* (Denisowski 2013)

wisdom, knowledge

致 zhì: “completion”

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 308)

- a. arrive despite difficulties
 - i. Left character: zhì 至: pictograph of a bird swooping down towards
the ground. Arrive, stop, to, until, extremely.

- ii. Right character: sūi 夂: person (rèn 人) with mark suggesting shackles. Walk with difficulty.

2. *Chinese Etymology Dictionary* (Sears 2011)

to send / to present / to convey / to transmit / to extend (thanks, etc.) / to cause to come / to cause (injury, death, etc.) / to achieve / to attain / to amass (fortune) / one's principle (interest, hobby, etc.) / to bring about / to occasion or result in / to retire / to resign

3. *Chinese Text Project*

- a. send, deliver, present; cause
 - i. Left character: zhì 至: reach, arrive; extremely, very
 - ii. Right character: suī 夂: rap, tap; radical number 66

4. *Nciku Dictionary* (2013)

- a. send, concentrate, cause, result in, appeal, fine
 - i. Left character: zhì 至: arrive
 - ii. Right character: pū 夂: undefined

5. *Zhendic Dictionary* (Denisowski 2013)

to send, to devote, to deliver, to cause, to convey

至 zhì: “arrive”

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 308)

- a. arrive
 - i. Main character: zhì 至: pictograph of a bird swooping down towards the ground. Arrive, stop, to, until, extremely.

2. *Chinese Etymology Dictionary* (Sears 2011)

to arrive at / to reach (a destination) / very / extremely / to indicate the superlative degree—the most

3. *Chinese Text Project*

- a. arrive
 - i. Main character: zhì 至: reach, arrive; extremely, very

4. *Nciku Dictionary* (2013)
 - a. arrive
 - i. Main character: zhì 至: arrive
5. *Zhending Dictionary* (Denisowski 2013)

arrive, most, to, until

天下至誠 tiān xià zhì chéng “most perfectly sincere” (Gardner 2007, 124)

質 zhì: “stuff”

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 106)
 - a. money/(cowrie) shell with double axe, suggesting mutual nature of exchange, nature, character, quality
 - i. Top characters: jīn 斤: two pictographs of axes, pound, cattie
 - ii. Bottom character: bèi 貝: pictograph of cowrie shell
2. *Chinese Etymology Dictionary* (Sears 2011)

matters, substances, elements, one's disposition or temperament, qualities, simple, plain, to question, to confront
3. *Chinese Text Project* (Sturgeon 2013)
 - a. matter, material, substance
 - i. Top characters: jīn 斤: a catty (approximately 500 g); an axe; keen, shrewd; KangXi radical number 69
 - ii. Bottom character: bèi 貝: sea shell; money, currency
4. *Nciku Dictionary* (2013)

nature, quality, matter, pledge, simple, question
5. *Zhending Dictionary* (Denisowski 2013)

hostage, substance, nature, quality

坐 zúo

1. *Chinese Characters: A Genealogy and Dictionary* (Harbaugh 1998, 209)
 - a. two people on the ground
 - i. Top character: rén 人: pictograph of a human, person
 - ii. Bottom character: tǔ 土: pictograph of object rising through the earth. Soil, earth, dirt, land, ground.

2. *Chinese Etymology Dictionary* (Sears 2011)

to sit / a seat / to ride (on a bus, train, etc.) / to kneel / to reach / to arrive at / (said of a building) to have its back towards / to get (profit, etc.) without work / to keep on / to persist in / (said of a building) to fall back from pressure / to sink / (said of gun, etc.) to recoil / to kick / to be accused for a crime / to be punished / owing to / because of

3. *Chinese Text Project* (Sturgeon 2013)
 - a. sit; seat; ride, travel by
 - i. Top character: cóng 从: from, by, since, whence though
 1. Left and right characters: rén 人: man; people; mankind; someone else
 - ii. Bottom character: tǔ 土: soil, earth; items made of earth
 1. Top character: shí 十: ten, tenth; complete; perfect
 2. Bottom character: yì 一: one; a, an; alone

4. *Nciku Dictionary* (2013)
 - a. sit, sit by the window, travel by
 - i. Top character: cóng 从: follow, follow the crowd, follow convention, obey, blindly follow, participate in, do everything simply
 - ii. Bottom character: tǔ 土: soil, land, native land, territory, opium, local, folk

5. *Zhending Dictionary* (Denisowski 2013)

to sit, to take a seat, to take (a bus, airplane etc.)

Appendix C: Birdwhistell's Shao Yung Translation

I have included extended quotes here from Dr. Birdwhistell's (1989) work *Transition to Neo-Confucianism: Shao Yung on Knowledge and Symbols of Reality* on Shao Yung, as Shao Yung's words are particularly supportive of my arguments in this project. Passages are quoted with permission from Stanford University Press.

With his concept of *fan-kuan*, [*fǎn guān* 反觀] Shao Yung was proposing to eliminate the individual self as a perceiver, as a particular person distinct from others. Shao's goal was to observe, contemplate, and understand (perceive) a thing in terms of itself and not in terms of the separate perceiver. There should be no awareness of separation between subject and object; they are to form a whole. This is possible for the sage because he completely empties his mind and the object perfectly fills it, like a reflection in a mirror. The sage's mind and the object are identical, and there is no question or possibility of distinguishing between subject and object. In Shao's concept of *fan-kuan*, one gains perfect "insight" through total identification with the other.

Shao expressed these ideas in the following statements.

If one perceives things from the viewpoint of things, it is their nature [that one perceives]. If one perceives things from the viewpoint of one's self, it is a matter of one's feelings/circumstances. The nature is public and clear, the feelings are private and obscured.

If one does not perceive a thing from the viewpoint of the self, then one can perceive a thing from the viewpoint of the thing.

The sage benefits things and has no self.

If one relies on the self, then it is a matter of one's feelings. If it is a matter of one's feelings, then there are obscurations. If there are obscurations, then things are murky.

If, however, one depends on the thing, then it is a matter of its nature. If it is a matter of its nature, then it is a matter of spirit [*shén* 神]. If it is spirit, then it is clear and bright.

Have no preconceptions, no dogmatism, no obstinacy, and no self. If you unite these things and speak of them, then they are one. If you divide them and speak of them, then they are two. If you divide them [again] and speak of them, then they are four.

It begins with having preconceptions and is completed with having a self. If there are preconceptions, afterward there is

dogmatism. Dogmatism is produced from preconceptions. If there is obstinacy, afterward there is a self. The self is produced from obstinacy. (Birdwhistell 1989, 186)

In the learning of the principles [*lǐ* 理] of things, sometimes there is that which one does not understand [*t'ung*][*tōng* 通]. One cannot force understanding. If one forces understanding, then there is a self. If there is a self, then one loses the *lǐ* [理] and enters into techniques [*shù* 術]. (*Shu* {techniques} were considered an inferior type of knowledge).

If the mind is whole and not split, then it can respond to the myriad changes. This is how the superior man empties his mind and does not let it move.

In these and other passages, Shao stated both how people normally think—they make a distinction between themselves and others—and how, with the sage as the model, they can overcome this way of thinking. Anyone who tries to perceive a thing from a particular viewpoint, or to force understanding, will end up with a partial and biased understanding. Some aspects of the thing will be obscured because the whole cannot be seen or understood from one angle only. Moreover, one's mental state will contribute to mistakes or inaccuracies in perception. Anyone, however, who tries to perceive a thing from the viewpoint of total identification can understand it completely. The reality of a thing is its nature [*xìng* 性], from which is equivalent to *lǐ* [理](pattern, principle). These terms referred to a thing's pattern of activity or behavior. To Shao, one cannot totally understand a thing without complete identification with it; one has to forgo distinguishing between oneself and the thing.

For Shao, self-awareness clearly is a necessary part of the formation of a self. The self appears with conscious thoughts, preconceptions, and obstinacy. These things separate the self from the surrounding world, cloud the mind, and prevent one from reaching a state of perfect understanding. They act like specks of dust on a mirror, because they interfere with the process of reflection.

Understanding involves getting past the outer, obscuring aspects of a thing and penetrating to its core. This had to be done with total ease and without force, however, for otherwise one's deliberateness would break up the unity and separate the self and the other. Here again we see the use of the inner-outer distinction and the concept of *wu-wei* of the *Lao Tzu*. (Birdwhistell 1989, 187)

On [Shao's highest] level there is no self, and things are perceived according to *lǐ* [理]....Shao used the terms *shou* [*shǎo* 少](receive) and *shan* [*shàn* 善] (complete), as in the eye receives the colors, the ear receives the sounds, and the eye completes the colors, the ear completes the sounds.

Shao's concepts of reflection perception (*fan-kuan*) [*fǎn guān* 反觀] and seeing things as things (*yi wu kuan wu*) [*yǐ wù guān wù* 以物觀物] contains similarities to the concept of expanding the mind (*da xīn* [大心]) of Chang Tsai. Shao and Chang used different words, but their positions were extremely close. Both Shao and Chang argued for merging the self with the whole, so there is no consciousness of self and other.

Chang Tsai's concept of *dà-xīn* [大心] implies expanding one's consciousness until it encompasses all things in the universe. When this state is achieved, there is no distinction between oneself and the world.

If one expands one's mind, then one can embody all the things of the world. If some things are not yet embodied, then one's mind still has things outside of it. The minds of ordinary people stop with the narrowness of hearing and seeing. The sage, however, completely develops his nature and so does not restrict his mind to seeing and hearing. He sees the world as not having a single thing that is not himself. This is why Mencius said that if one completely develops one's mind [*xīn* 心], then one will know nature and heaven. Heaven is so vast that there is nothing outside of it. A mind that has things outside of it cannot unite itself with the mind of heaven. Knowledge from seeing and hearing is knowledge derived from contact with things. It is not what one's virtuous nature knows. What one's virtuous nature knows does not sprout from seeing and hearing.

Rather than speak of no-self, however, as Shao Yung did, Chang Tsai said that everything becomes one's own self. Whether stated in a positive or negative way, the idea in both cases is that there is no subject-object distinction. Chang distinguished the sensorial knowledge of ordinary people, which he called *wen-jiàn chih chih* [*wén-jiàn zhī zhì* 聞見之智] (knowledge from hearing and seeing), and the qualitatively different knowledge of the sage, or *te-hsing chih chih* [*dé xìng zhī zhì* 德性之智] (knowledge from one's virtuous or moral nature). For Chang, it was this second kind of knowledge that enabled the sage to merge with the universe. His allusion to Mencius makes it clear that he was thinking of a Mencian type of moral and spiritual cultivation. (Birdwhistell 1989, 194–95)

Appendix D: Glossary: Complexity Science

Chaos: Unpredictability in a Deterministic System

Definition of chaos. Chaos is deterministic unpredictability (Strogatz 2008, lect. 1, 9:30).

Determinism and Nondeterminism: Cause–Effect and Karma

Sometimes called *causal* determinism, *determinism* is an idea that things in a system happen the way they do because of a temporal cause–effect relationship. In other words, what is happening now and what will happen in the future are *determined* by what happened in the past. “There is only one possible future, given the present” (Strogatz 2008, lect. 1, 9:30). Determinism in philosophy has sometimes been characterized as saying that human beings have no “free will” because the outcomes of human behaviors are all known.

Nondeterminism is a system in which any state of the system is not determined by the previous state of that system; in other words, the states of the system are *independent*. Examples of nondeterministic systems are found in the decay of radioactive isotopes, where particles are spontaneously emitted. Some say quantum states fluctuate spontaneously “without cause,” and can be considered nondeterministic (Strogatz 2008, lect. 1, 9:56).

Eastern philosophy offers the idea that the cause and the effect are the same. This is known as “karma,” literally translated as “doing” (A. Watts 2005). Since there is only the cosmos “doing,” (and within this thesis I have been talking about that we are something the cosmos is doing, and the “doings” of the cosmos are the organic patterns of *li* 理,) separate doings that we had thought were related

by cause and effect, and doings that we thought was human “free will” are simply the actions of the cosmos within and fulfilling the deep ubiquitous organic *patterns* of the cosmos—in a way that is sensitive to initial conditions—it is in *this* way that cause and effect are the same.

Self-Similarity and Scale Invariance

It was the terms *self-similarity* and *scale invariance* that first drew my attention to a possible relevant parallel between complexity science and Chinese philosophy (the topic of Chapter 5). *Self-similarity* refers to the composition of a pattern, where the parts of the pattern recapitulate the larger pattern (e.g., Bar-Yam 1997, 258-9, 283; Gleick 1987 103, 115-16, 227). *Scale invariance* refers to the parts of the pattern reflecting the larger pattern, no matter the scale of the parts (e.g., Schroeder 1990, 122, 304, 330). In fractal figures such as the edges of the Koch curve (e.g., Schroeder 1990, 7, 63) and Mandelbrot set (e.g., Schroeder 1990, 279, 296, 298), the scales of the pattern are infinite. In natural structures, the compound stems of certain ferns are isosceles triangles in general shape and their leaves are also of the same isosceles shape, as are the leaflets extending from the leaves (e.g., Gleick 1987, 198, 238).

In twentieth-century science, self-similarity was first described by Benoit Mandelbrot (1965) while he was working for IBM with the problem of noise in the telephone lines between computer terminals and mainframes. In 1965, the only computers were large, room-sized “mainframe” machines that were housed in a central location. Terminals, a little larger than a manual typewriter table, were equipped with a keyboard and perforator/reader that would punch out oiled paper

tape with encoded instructions. Since computer time was very expensive, problems were worked out before contacting the mainframe computer. When programs were ready to be sent to the mainframe, the terminal operator would dial up the mainframe using standard telephone lines, and feed the pre-punched paper tape through its reader, which would then send digital information over the telephone line. Noise on the telephone lines would cause data to be lost in transmission from the terminals to the mainframe, leading to problems in programming. IBM set Mandelbrot to try to solve the problem (IBM 2014, paragraph 2).

When Mandelbrot studied the noise on these telephone lines, he made a startling discovery. The bursts of noise were consistent in pattern, yet there was an additional domain of information—not only were these patterns consistent in linear repetition, but they were also consistent at varying degrees of scale, in time and in space. In time the patterns were similar across wide domains; from a fraction of a second to a year, the patterns of noise repeated themselves. In space, Mandelbrot could focus in on smaller and smaller units within the same sample and find the same patterns. This study alerted Mandelbrot that there might be other patterns in nature with similar characteristics. After more research, he found that all of nature exhibits these characteristics of self-similarity (Mandelbrot 1977).

Self-Organization

Ilya Prigogine won the 1977 Nobel Prize in Chemistry for his work on self-organization in systems in non-equilibrium or far-from-equilibrium

conditions. His work focused on the oscillatory patterns of the Belousov-Zhabotinski reaction that would of its own inertia, change color and develop spiral patterns (Prigogine and Stengers 1997). Figure D1 shows two different series of views of progressions of the Belousov-Zhabotinsky reaction. The views on the left show complex growth from centers, where the views on the right show complex growth in spiral patterns..

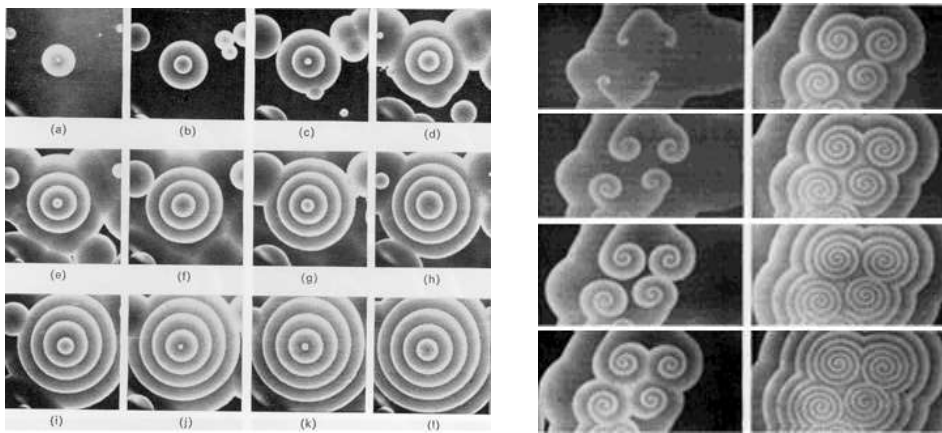


Figure D1. Concentric and spirial examples of the Belousov-Zhabotinsky reaction (Zhabotinsky 2007). Reprinted under the terms of a Creative Commons Attribution NonCommercial-ShareAlike 3.0 Unported license.

A simple example of self-organization of a system that is far from equilibrium is an eddy or whirlpool in a river. As the water seeks equilibrium in its flow towards the sea, the whirlpools spontaneously form from responding to roughness at the river bed.



Figure D2. A whirlpool in water (Shutinc 2011). Reprinted under the terms of a Creative Commons Attribution-ShareAlike 3.0 Unported license.

Power Laws

A power law is properly stated as: $1/f(\text{noise})$ (where f is frequency—or time) and is an inverse function. Simply put, a *power law* is the inverse relationship between (in one domain) the intensity of events and the frequency at which such events occur (Schroeder 1990, 33-40).

A logarithmic time-plot of the intensity of earthquakes is one example; Figure D3 shows graphs and locations of earthquakes registered in the New Madrid, Missouri fault zone (Bak 1996).

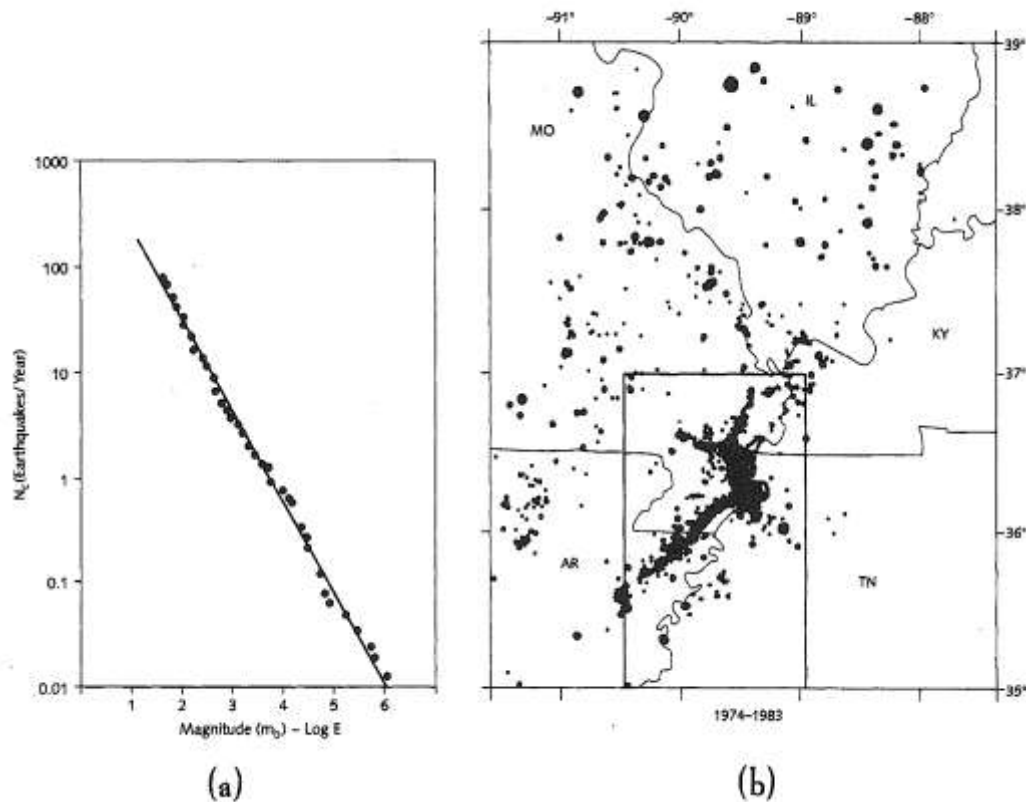


Figure D3. Logarithmic time-plot and geographic locations of New Madrid, Missouri earthquakes. The graph on the left (a) refers to the power law; the graph on the right (b) plots the location of quakes over time. Reprinted from Bak (1996, 15), with kind permission from Springer Science + Business Media.

As one can see, there are few large earthquakes, and lots of little ones, across the domain of time. Zipf's Law (Weisstein 2014) is another example of an inverse function regarding the frequency of use of specific words in the English language (Bak 1996, 26; see Figure D4).

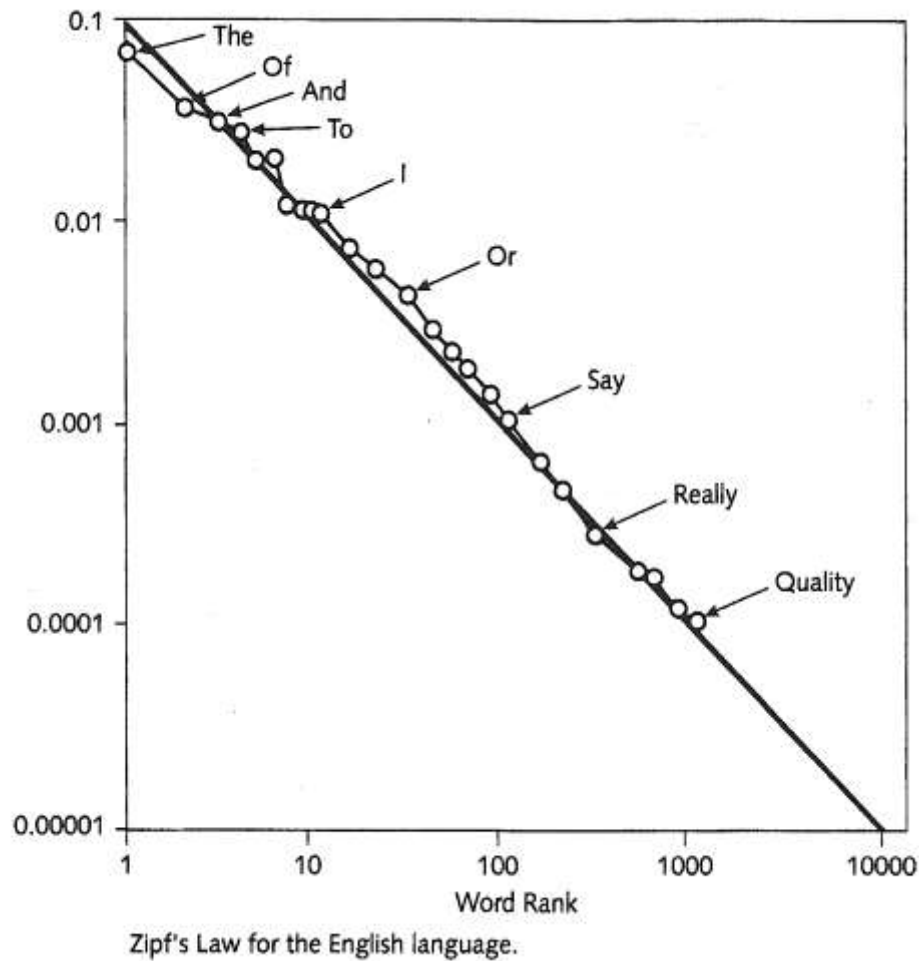


Figure D4. Zipf's Law for the English language. Graph reprinted from from Bak (1996, 26), with kind permission from Springer Science + Business Media.

Mandelbrot studied monthly variations in cotton prices (Mandelbrot, 1963) for thirty months. The points on Graph b in Figure D5 show this inverse relationship between time and price.

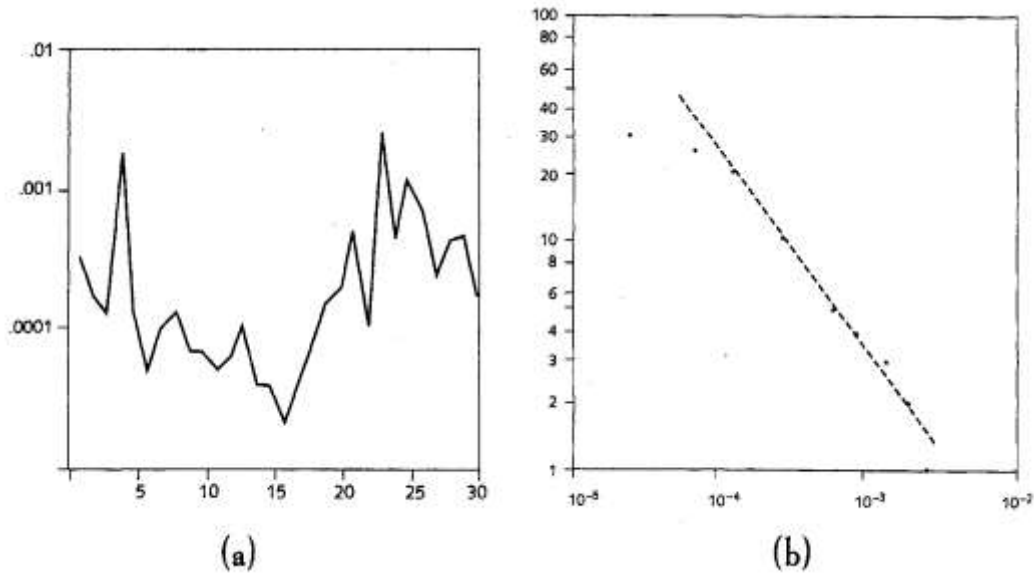


Figure D5. Monthly variations in cotton prices in 1963. Graphs reprinted from Bak (1996, 15), with kind permission from Springer Science + Business Media.

Power laws are important as they are an “endless source of self-similarity” (Schroeder 1990, 103). This self-similarity in pattern is temporal, or is a pattern over *time* rather than in *space* (as are the self-similarities exhibited in the Cantor set in Figure 9).

Bifurcation

Bifurcation describes how dynamical systems, with additional input, reach a state of instability and switch to a behavior where there are *two* stable states instead of one. With additional input, these systems will switch to a behavior of *four* states instead of two. As shown in Figure D6, these bifurcated stable states get very complex, and then, as the diagram shows, go into periods of relative stability for a short time period with only a few stable states rather than many. In a simple way, the hexagrams of the *I-Ching* are bifurcation diagrams.

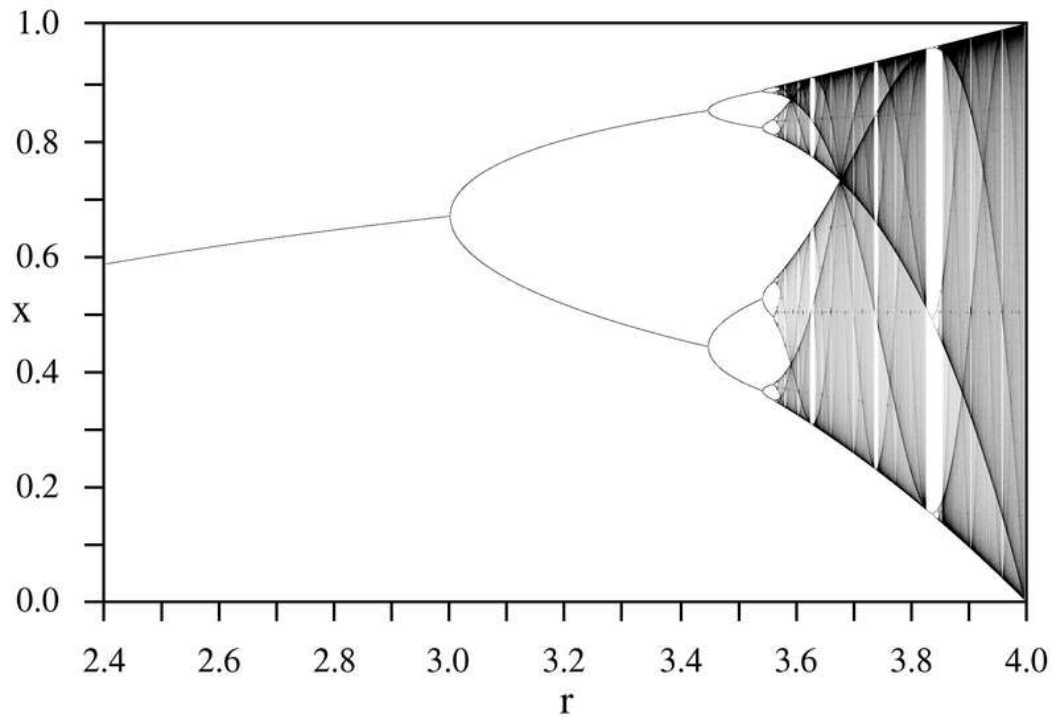


Figure D6. Bifurcation Diagram (PAR 2005). Public Domain image retrieved from Wikimedia Commons.

The *I Ching*: Period 3 Phenomena of Bifurcation

There is a diagram describing bifurcations or decision points of the activity of a system (first studied from biological populations; Gleick 1987, 70), where the “steady state” of an organic system is infused with energy until a crisis point is reached. At the crisis point, the steady state bifurcates from the single trajectory it was following into two relatively steady states, called *periods*. When a single state bifurcates, it becomes a *period two* state (Figure D7).

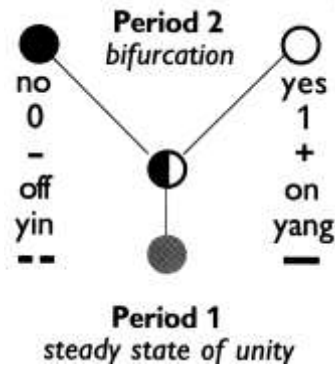


Figure D7. Period 2 state. Reprinted with permission from Walter (1994, 74).

When the period-two state again bifurcates from further infusion of energy, it splits into four stable states, and becomes a period four state (e.g., Figure D8). Another illustration of period doubling is figure D9, which ultimately becomes a period eight state.

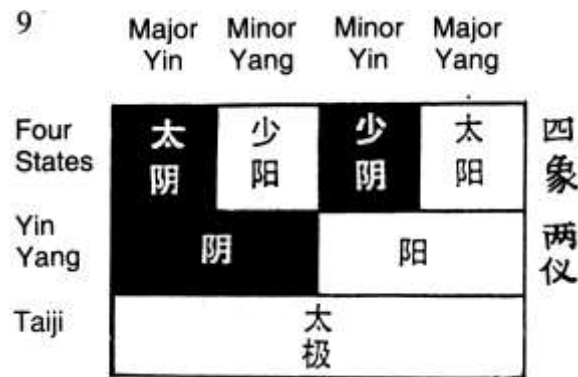


Figure D8. Period-four state diagram. Reprinted with permission from Tan and Koh (1993, 42).

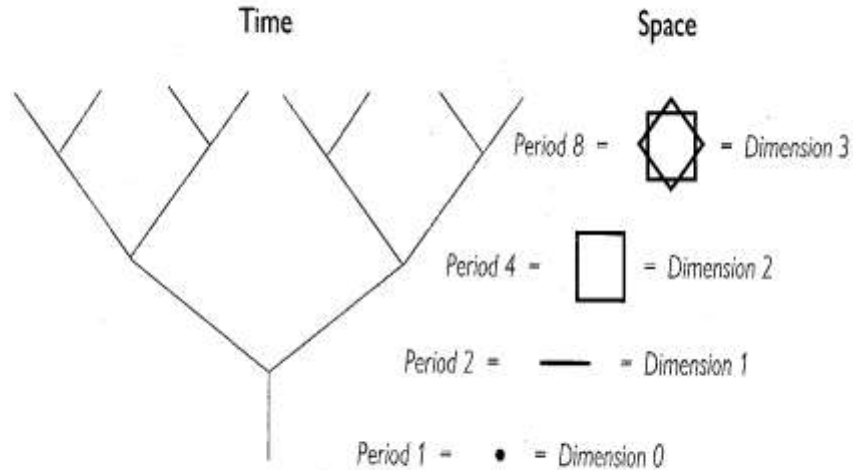


Figure D9. Progressions of states to period eight. Reprinted with permission from Walter (1994, 98).

However, sometimes “near the bifurcation (point), chance (or ‘randomness’) plays a significant role (Bütz 1997, 12) and (in a very simplified description of period-three phenomena) one of the two states will not bifurcate. Then, instead of four branchings the now-steady states will have only three branchings, known as a *period-three state*. The graph below in Figure D10 is a detail of Figure D6. As can be seen, there is a void space across which there are three branchings—this is a period-three state that then becomes chaotic.

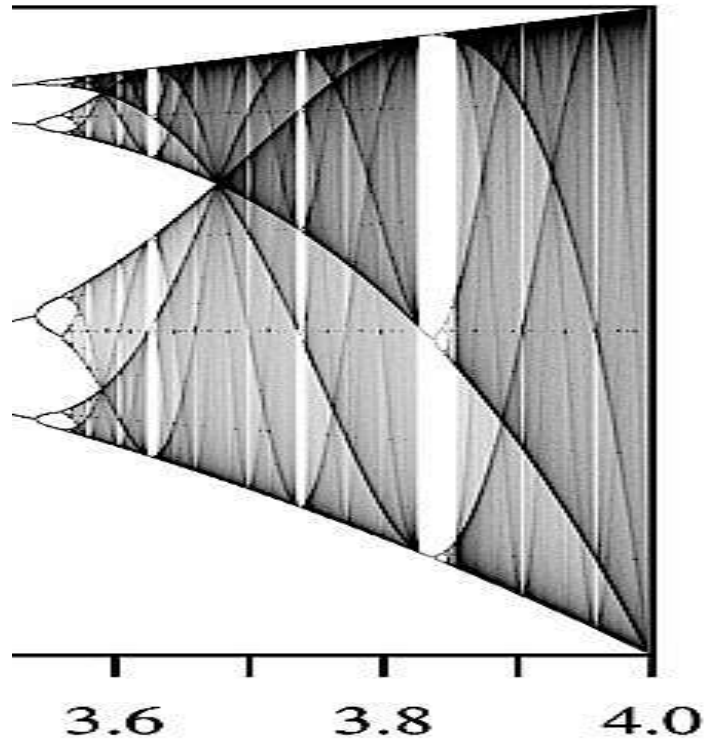


Figure D10. Detail of Figure D7 showing period-three state (PAR 2005). Public Domain image retrieved from Wikimedia Commons.

Each of these three divisions in a period-three state can become a component of a one of the eight “trigrams” of the *I Ching* (Figure D11). Period-three states are chaotic “because you can predict an overall pattern but you...cannot specify any exact point of its next manifestation....Chaos theory has enabled us to see pattern within apparent random events” (Walter 1994, 78). “The underlying order emerges out of chaos” (Bütz 1997, 14).

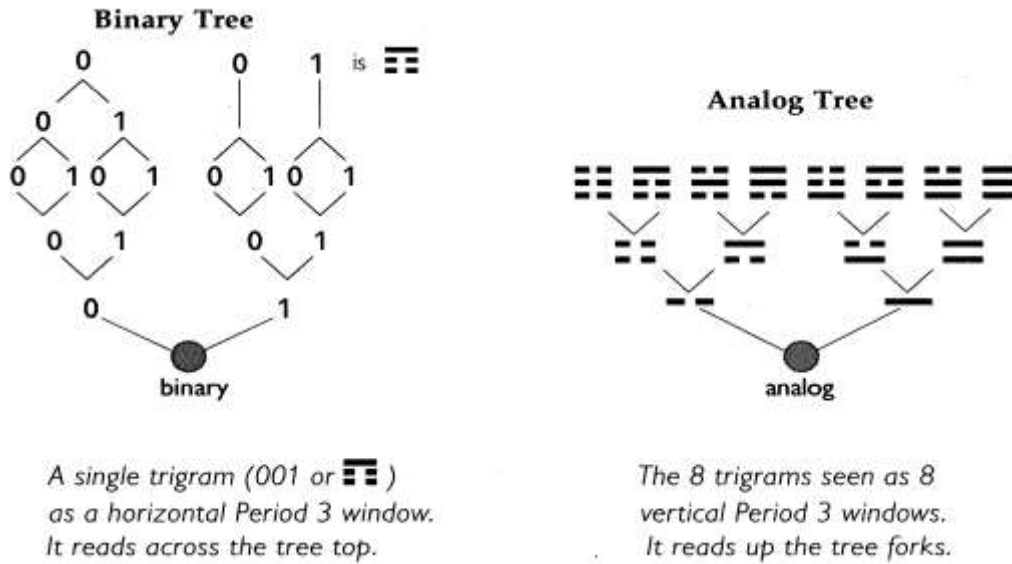


Figure D11. Binary Tree and Analog Tree, Reprinted with permission from Walter (1994, 119).

Chapter 42 of the *Tao Te Ching* also states the utility of period three and chaos. This chapter is illustrated in Figure D12.

The Tao begot one.
 One begot two.
 Two Begot three.
 And three begot the ten thousand things.
 The ten thousand things carry yin and embrace yang.
 They achieve harmony by combining these forces. (Feng and English 1972, 42)

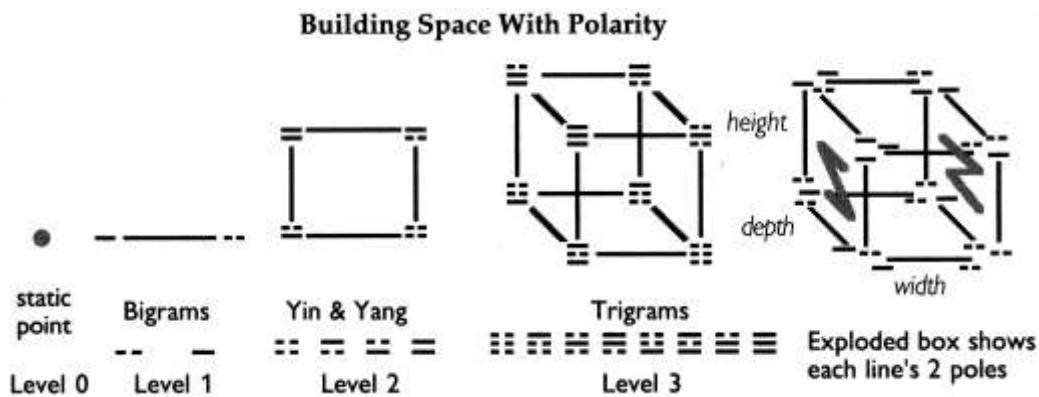


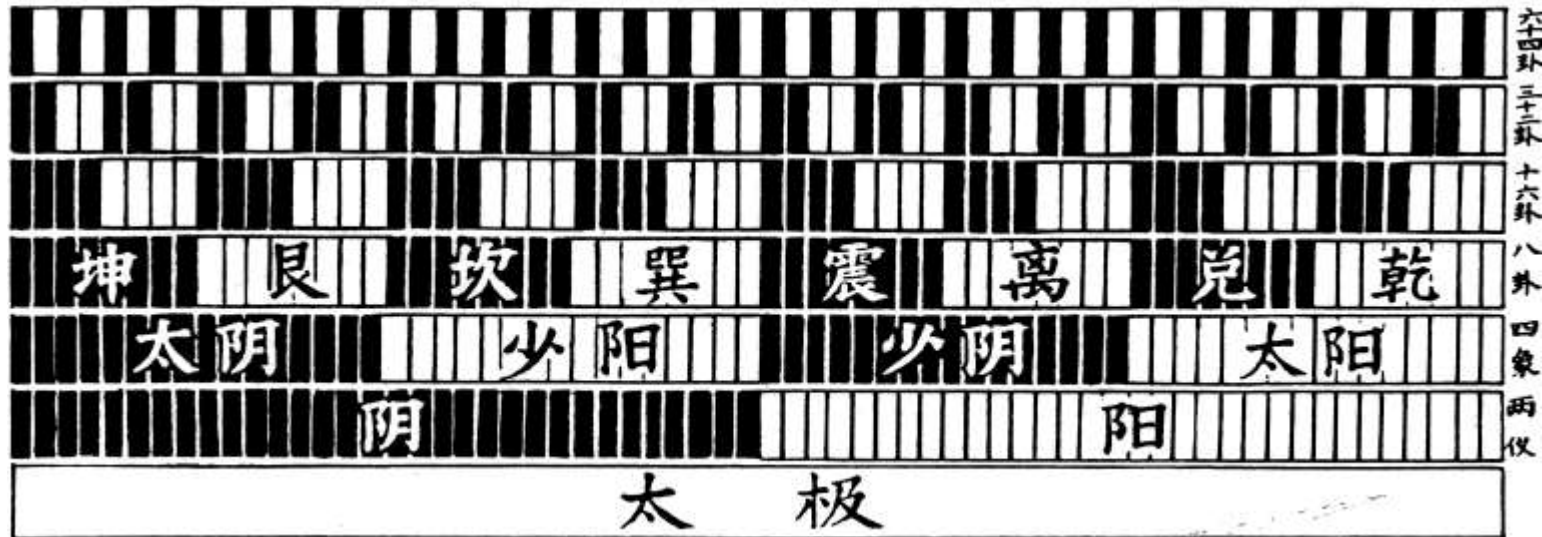
Figure D12. Building Space With Polarity. Reprinted with permission from Walter (1994, 125).

Figure D13 illustrates the bifurcation process through six iterations.

The Sequence of Fu Xi's 64 Hexagrams

伏羲六十四卦次序

坤 比 观 豫 晋 否 谦 艮 渐 小 旅 咸 遁 师 蒙 坎 涣 解 未 困 讼 升 蛊 井 巽 恒 鼎 大 姤 复 颐 屯 益 震 噬 随 无 明 贲 即 家 丰 离 革 同 临 损 节 中 归 睽 兑 履 泰 大 需 小 大 大 夬 乾
 八 七 过 六 济 五 过 四 噬 妄 夷 济 人 三 人 孚 妹 二 畜 畜 壮 有 一



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Figure D13. The Sequence of Fu Xi's 64 Hexagrams. Reprinted with permission from Tan and Koh (1993, 44).

Sensitive Dependence on Initial Conditions

Sensitive dependence on initial conditions (e.g., Bar-Yam 1997, 20, 94, 116, 132, 140, 258, 469–70, 471) is popularly known as the “butterfly effect.” This is an example where the flapping of a butterfly’s wings in the Amazon basin will affect the dynamical system of the atmosphere to the point where a hurricane may form in the Atlantic Ocean. The butterfly effect describes the sensitivity of dynamical systems to very small initial inputs of energy, particularly at the beginnings of repeated iterations of these systems (e.g., Gleick 1987, 8, 20–23, 246–47, 261). Another example is whether a seed falls upon rock or on fertile soil, and to the degree that soil is fertile, it determines the way the plant will grow.

Appendix E: Glossary: Sound: Physics and Terms

“All of Nature is made up of self-organizing vibratory activity.”
–Rupert Sheldrake (personal communication with author,
September 2012)

It is not my intention to give any sort of exhaustive explanation of sound or the mathematics of music in this appendix. I wish only to assist the reader with some background by which to understand some of the references I make to sound in the main body of the book. Please see Dr. Gareth Loy’s (2006, 2007) exhaustive two-volume set *Musimathics, Volume 1 and Volume 2* for a comprehensive foray into sound, music, and mathematics.

The statements I make in this appendix regarding music theory, physics of sound, and mechanics of piano tuning are based on my 50 years of experience as a professional piano technician. While some citation of scholarly work in these areas has been made, much of the discussion of these topics is from my professional experience.

Basic Wave Mechanics: Physics of Sound

What is sound? Sound is vibration, or waves of movement of a medium. When the medium is air, human beings can hear the vibration because of how human ears are constructed. Vibrating media can be anything from strings of energy in the so-called “string theory,” to fields of energy as in radio waves of electromagnetism, to the earth in an earthquake, to thoughts. There must be a source of the movement of the media. The movement of vibrating media is called oscillation, because the medium moves back and forth according to some fixed period or unit of time. This used to be called “cycles per second” which denoted cycles of oscillation per second, or abbreviated as “cps.” This unit is designated as

“Hertz,” after German physicist Heinrich Hertz, and the unit is abbreviated as Hz (Pierce 1983, 42). In the following figure, one can see the vibrations or oscillations of a tuning fork (Figure E1, left) compressing and rarefying molecules of air (Figure E1, right) to produce a wave with a specific frequency.

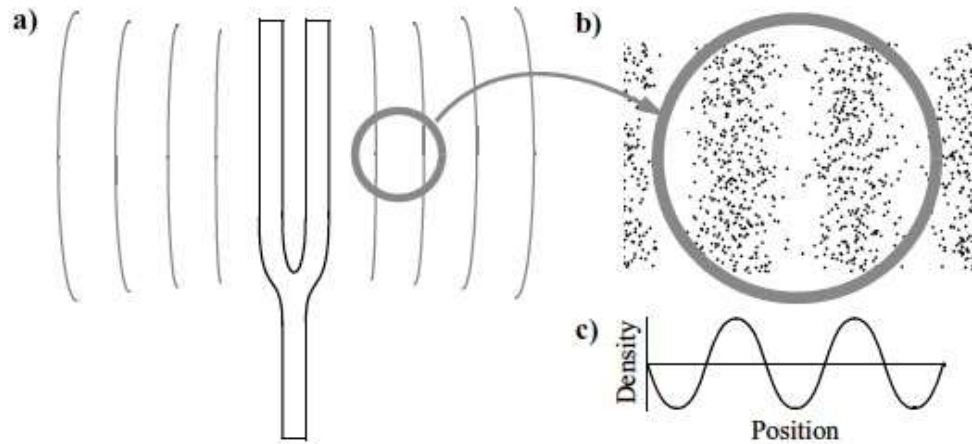


Figure E1. Sound wave from a vibrating tuning fork. Reprinted with permission from Loy (2006, 2).

Similarly the oscillations of the tuning fork, if marked on a moving strip of paper would show the figure of a wave, as shown in Figure E2.

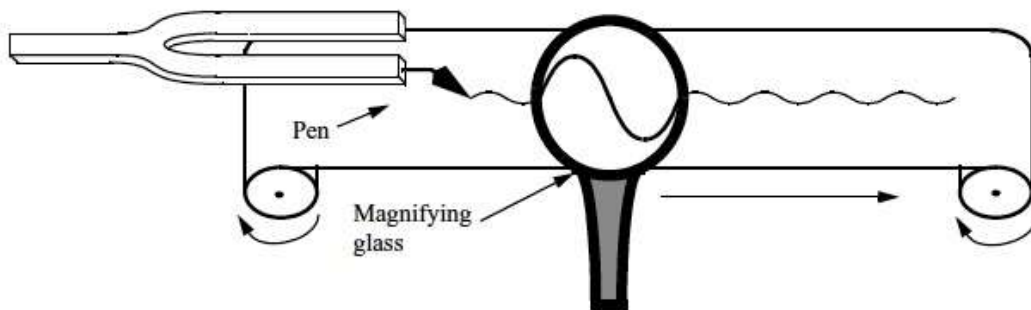


Figure E2. Wave shape of a vibrating tuning fork. Reprinted with permission from Loy (2006, 4)

Figure E3 shows the waveform of a plucked string, which decays over time.

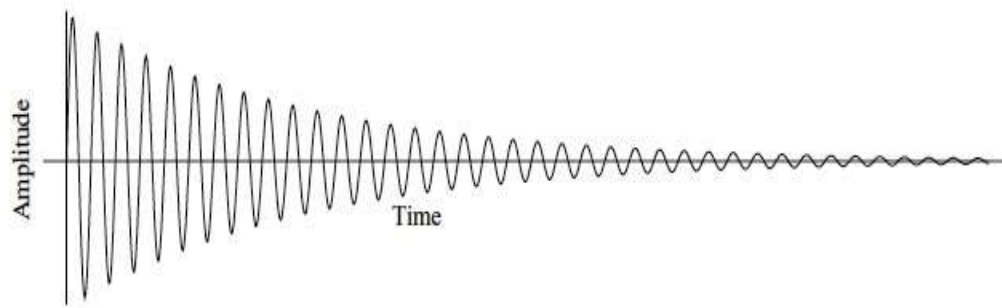


Figure E3. Damped waveform of a plucked musical instrument. Reprinted with permission from Loy (2006, 8).

The medium to consider for this discussion would be a string of some kind.¹⁹⁶ In musical instruments, strings are usually made of gut,¹⁹⁷ wire, or in more recent times, of nylon. The string must have a context in which to move, such as the string being on an instrument of some kind—such as a violin, guitar, or piano. The string must be under some tension, that is, the string is stretched between two points on an instrument, so that the portion of string between two points can move freely. Tension is imparted to the string by stretching the string between two points on the instrument. Stringed instruments are designed to hold a certain amount of tension imparted by the total number of strings on a specific instrument. Without tension, the string is limp, and though it can be moved through the introduction of some energy, we do not think of the string as

¹⁹⁶ Vibrating media can be anything from strings of energy in the so-called “string theory,” to fields of energy as in radio waves of electromagnetism, to the earth in an earthquake, to thoughts.

¹⁹⁷ Gut strings are made from the small intestines of sheep.

vibrating. Only when it is stretched between two points, does that part of the string that is stretched have the potential to oscillate in a regular fashion.

Pitch/Frequency

Where tuning forks and strings of musical instruments (among other vibrating media) have movement as they oscillate, a precise focus can be brought to specific frequency that these oscillators have as they vibrate. The frequency at which a string vibrates is known as the “pitch” of the string. The period (or distance between wave peaks) of the wave determines the frequency (Hz). A higher pitch will have a smaller period and a lower pitch will have a larger (or longer) period. In Figure E6 are shown some examples of pitches of five different frequencies.

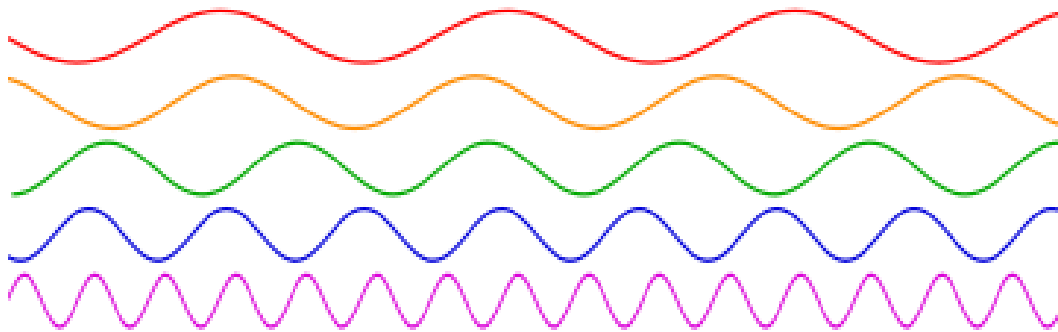


Figure E4. Sinusoidal waves of various frequencies (Lucas 2007). Public Domain image retrieved from Wikimedia Commons.

Harmonics and Intervals

When the wave of an oscillator is “pure,” that is when it has no other frequencies associated with it (such as is the wave produced by a tuning fork), the wave will have few other frequencies that stand out as distinct from the main or fundamental pitch. But most oscillators, such as strings have identifiable frequencies, that are different from fundamental pitch, that *do* stand out from the

fundamental. These frequencies that are identifiably different from the fundamental are known as “harmonics” or “partials” as they are part of the fundamental. These various parts of the fundamental are related to the fundamental by a ratio.

When a string is tensioned between two points, that length of string is known as its “speaking length.” When a speaking length of a string is divided in half, one gets the octave above the fundamental, or double the pitch of the original speaking length. When the string is divided into thirds, one gets an octave and a fifth. The interesting thing is that in harmonies, when two different vibratory media are sounded, that have certain ratio-nal relationships, different parts of these strings will resonate together in a way where they join together as a unison. This unison of partials is different that the original pitches of the strings. In other words, the one of the partials of one pitch may be a resonant unison with another of the partials of a second pitch. So even though the basic pitches are different, there are parts of them that can become one. The unison of partials in this way is a third pitch that occurs between the two different basic pitches.

Figure E6 shows how a fundamental pitch (the largest wave shown) can encompass many other waves. The top wave is the fundamental, the next wave down is the second partial, the third wave down is the third partial and so forth. Notice the lines that connect certain of the crossing points, known as “harmonic nodes,” of certain partials. It can be seen that the second partial, the fourth partial, and the sixth partial all share a crossing point or node. The fourth partial and the sixth partial share three nodes.

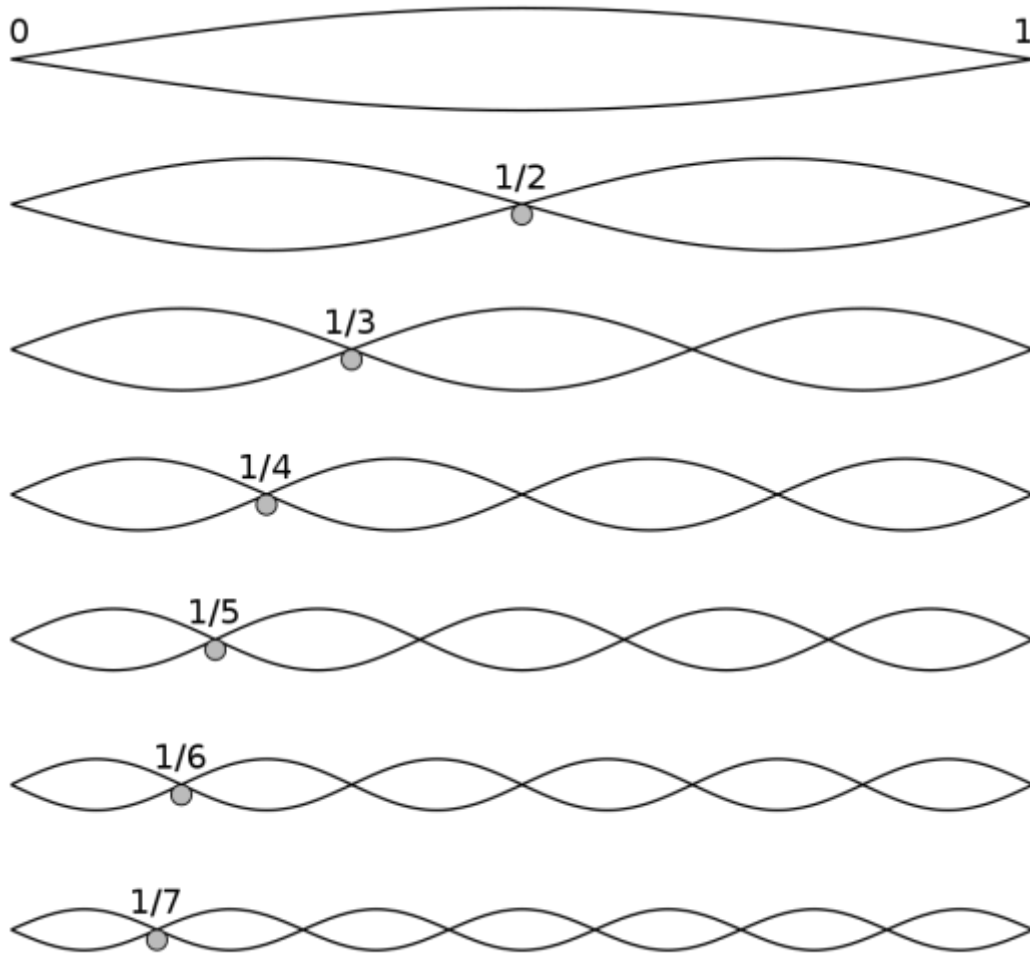


Figure E5. The Harmonic or “Overtone” Series. Sinusoidal waves of various frequencies (Lucas 2007). Public Domain image retrieved from Wikimedia Commons.

Intervals

Intervals are the distances between musical pitches. It is the relationship that is developed by a specific distance that makes for a specific interval. Figure E7 shows the pitch relationships between basic intervals. The names of the interval denotes the relationship and distance between two pitches. As examples, unison is where two strings are pitched the same and the ratio of a unison is 1:1. An interval of a fifth is where the pitches have a relationship of 3:2 to each other.

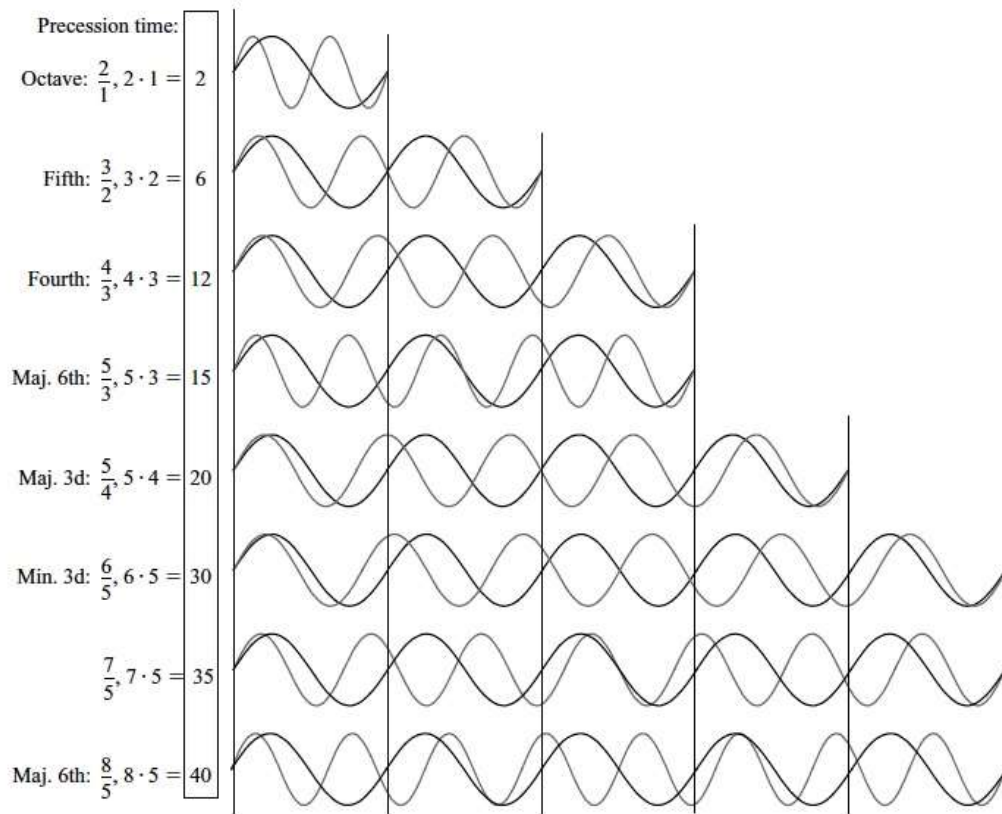


Figure E6. Precession time for various intervals. Reprinted with permission from Loy (2006, 59).

Beats

Beats are interference patterns between two similar pitches, or intervals with similar harmonics. When I tune a piano I listen to beat rates to adjust the proper distance between intervals. When the interval is a unison, I try to make the two or three string pairs beatless. Figure E7 shows interference patterns between two pitches, which results in an increased and decreased amplitude of the combined wave, beyond that of the original pitches.

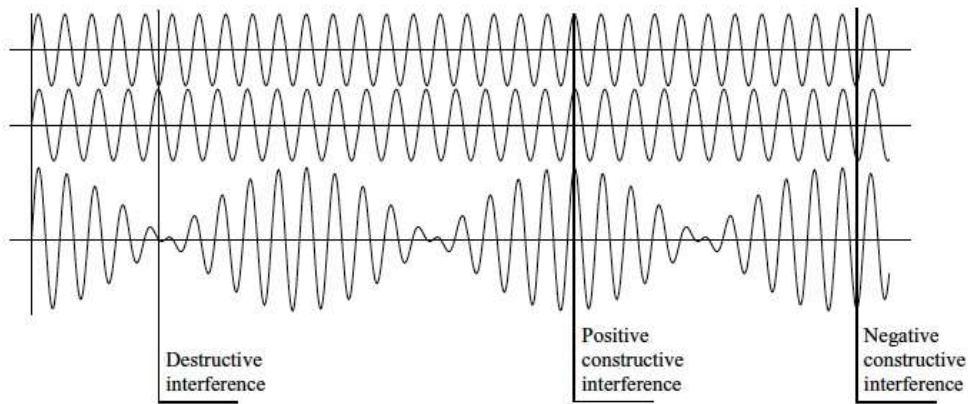


Figure E7. Beats. Reprinted with permission from Loy (2006, 173).

Standing Waves

Standing waves are pitches which are reinforced at the same time period as the frequency. With this reinforcement, the pitch does not decay, but appears to stand still. Figure E8 shows a string that is vibrating as a standing wave that is reinforced by its fourth partial.

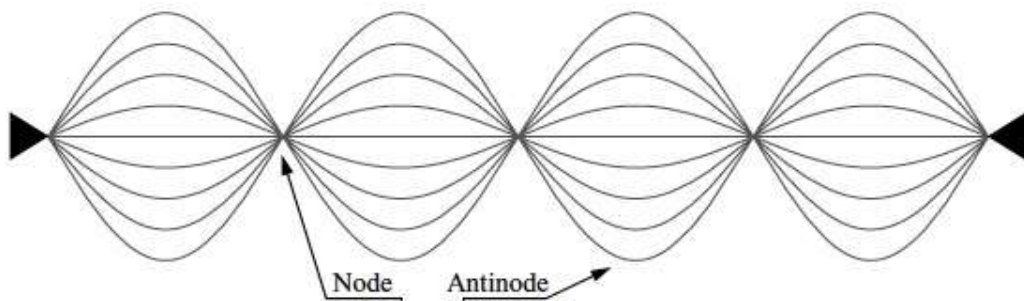


Figure E8. String mode 4 as a standing wave. Reprinted with permission from Loy (2006, 256).

Tempering the Reference Octave

The Pythagorean tuning is where intervals of a fifth are tuned “perfect,” without beats to each other, around the circle of fifths. This tuning gives “pure

intonation” but does not allow one to play in all keys. Modern Western tuning is known as the “equal temperament.” The equal temperament is a tuning system where each half step of the diatonic scale is made equal to the others, through a slight de-tuning of the major intervals. Pure intonation of intervals is sacrificed for being able to play in all keys. Perfect fifths are tuning intervals to the ratio of 3:2, the equal temperament tunes each half step as the $12\sqrt{2}$ of the octave.

When I set the twelve notes of the reference octave on the piano,¹⁹⁸ from which all other notes on the piano are tuned, I start by tuning one note on the piano to a single pitch from a tuning fork, usually A = 440 Hz. I then begin to set and establish all other intervals in a specific pattern.¹⁹⁹

Figure E9 shows the difference between a tuning as simple ratios between intervals, and the equal temperament.²⁰⁰ However, this pattern is only a theoretical idea of the spacing of, or intervals between the notes, that I have in mind. There is a difference between what I have in mind, what the designer had in mind when they laid out the blue-prints for the design of the piano, and the actual execution in physical reality of what the piano actually “wants.”

¹⁹⁸ known technically as “setting the temperament octave.”

¹⁹⁹ I primarily use what is called Equal Temperament, where each of the twelve half-step notes of the octave are spaced equally within the octave. Each half step is 1/12th of the octave.

²⁰⁰ See Isacoff (2003) for a thorough discussion of the development of the equal temperament in the West, and Cho (2003) for a discussion of the discovery of the equal temperament in China and Europe in the sixteenth century.

Comparison of Natural and Equal-Tempered Chromatic Intervals

Degree	Name	Error	Degree	Name	Error
1	Unison	0.0	7	Tritone	-9.7763
2	Minor second	-11.731	8	Perfect fifth	-1.955
3	Major second	-3.910	9	Minor sixth	-13.686
4	Minor third	-15.641	10	Major sixth	15.641
5	Major third	13.686	11	Minor seventh	3.910
6	Perfect fourth	1.955	12	Major seventh	11.730

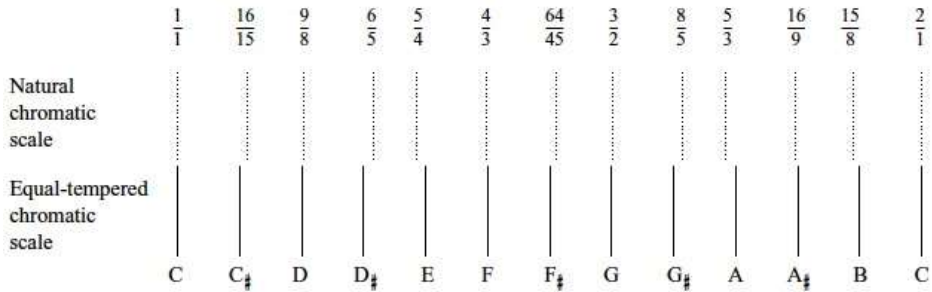


Figure E9. Natural and equal-tempered chromatic intervals. Reprinted with permission from Loy (2006, 71).

Part of my job as a piano technician is to discover what the piano “wants,” that is different in subtle ways, from what the designer and I think “should” be the case for how the reference octave is established. When I find what spacing and balancing of intervals (through tests and checks of beat frequencies) that the piano “wants,” and accommodate the theory of what I know to that, the sound piano seems to “open,” in its now-balanced state, and there is a kind of transparency to the function of the piano that I have described before.

This method of establishing a pattern²⁰¹ on a highly tensioned²⁰² system of a piano or a “self,” is very much like what I have come to know of the

²⁰¹ of notes, intervals, in a balanced way.

²⁰² Each piano has from fifteen to forty tons of tension from the strings, depending on the size of the piano.

hermeneutic method, where one approaches a topic with certain ideas about what the topic “means,” and then through repeated rounds of exposure, contemplation, and work with the topic, to come to know of the “topography” of the topic, the researcher’s understanding deepens and opens. The topic no longer holds the same meaning from the researcher’s entry and preconceived ideas about it at the surface, as it then does as the researcher enters a kind of dialectic with the topic, and allows subtle yet profound opening to occur.