

# East Asian Voices on Science and the Humanities

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## SCIENCE AND CONFUCIANISM IN RETROSPECT AND PROSPECT

by Hsu Kuang-Tai

*Abstract.* In contrast to Western science and religion, a topic which has been studied very much since the twentieth century, less research has been done on science and Confucianism. By way of a comparative viewpoint within the history of science, this article will deal with some aspects of science and Confucianism in retrospect, for instance, the Confucian origin of the idea of *tian yuan di fang* 天圓地方, the natural philosophy of *qi*, and the *wu xing li tian zhi qi* 五行沴天之氣 bringing abnormal astrological phenomena and reflecting a negative Confucian relation between politics, ethics, and nature.

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In the late Ming, Xiong Mingyu found that abnormal astrological phenomena, as atmospheric events, happened in the sublunar region rather than in the stars, and in the present time we can reinterpret the crisis of air pollution or global climate change as reflecting a negative Confucian relation between politics, ethics, and nature and as a warning of collective misbehavior in our use of modern scientific technologies.

*Keywords:* Chinese astrology; comparative viewpoint of history of science; natural philosophy of *qi*; science and Confucianism; *tian yuan di fang* 天圓地方; *wu xing li tian zhi qi* 五行沴天之氣

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In the past, scholars who paid attention to Western science and Chinese science have found that they came from different traditions and developed independently in each civilization. By dealing with the development of science in different civilizations, the history of science, as a branch of the humanities, has been regarded as a bridge between the humanities and the sciences. The history of science regards science as a conceptual system of nature and concerns “old science” rather than contemporary science. Thus, different cultures or civilizations have their own sciences. Historians of science study how “old science” developed in the past, including historical or social processes and results rather than the advanced results found by modern scientists.

Being a historian of science, I have taught “The Scientific Revolution” at National Tsing Hua University in Taiwan for more than fifteen years. At first, I simply introduced how Western science developed from Greek science through the Middle Ages to the sixteenth and seventeenth centuries. Because many scholars discussed questions like “Why did the scientific revolution not happen in China?,” this question inspired me to do some research on the comparison between science in Chinese civilization and science in Western civilization. In my classes, I gradually introduced my understanding of the different developments of science in these two civilizations.

I also pay attention to science and Confucianism. Although science and Confucianism have been regarded as two totally different disciplines in modern times, they were related to each other in traditional Chinese civilization, for Confucian classics and their commentaries contain abundant natural knowledge. However, in the past, less research was done on science and Confucianism. Because Confucianism was dominant in the culture of East Asia before the modern era, this article will focus on science and Confucianism and will take the viewpoint of a comparative history of science.

## SCIENCE AND RELIGION IN WESTERN CIVILIZATION

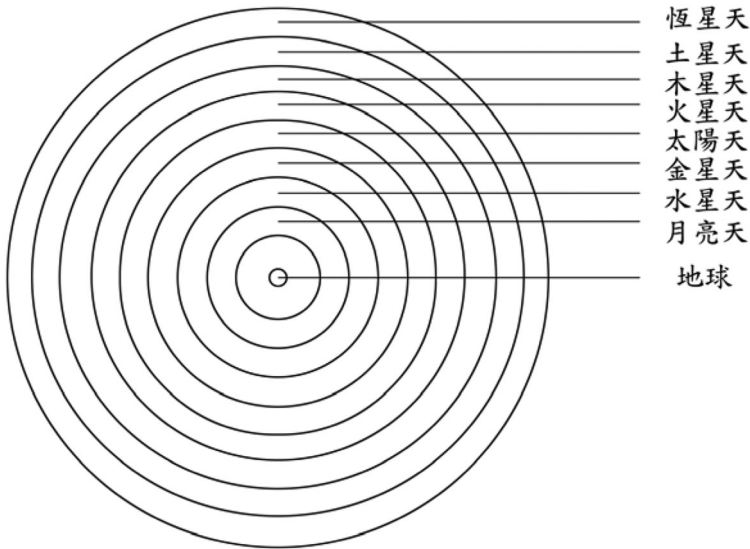
Although science and religion have been regarded as two totally different disciplines in modern times, they were closely related to each other from the Middle Ages to the end of the eighteenth century.

*Western science developed according to naturalistic thinking.* To my understanding, in ancient times Greek philosophers proposed different views about nature in terms of naturalistic thinking in the tradition of *Logos*. Perhaps influenced by Hesiod's *Theogony*, which presents a genealogy of the gods originating from one primordial god, Thales of Miletus (fl. 6th BCE) started naturalistic thinking by regarding water as the *archai* of many natural phenomena. He not only created a sensation in philosophy, but also a new way of thinking in natural philosophy or science.

*Aristotelian natural philosophy and his idea of science.* Based on the reasoned discourses of the Pre-Socratic philosophers and Plato, which describe natural phenomena in terms of statements or propositions, Aristotle (384–322 BCE) developed his natural philosophy by synthesizing earlier views of nature and establishing the two-sphere model of the cosmos, that is, with both Earth and Heaven as spherical domains (*tian yuan di yuan* 天圓地圓; Lindberg 1992, 42f., 90f.). The cosmos is depicted as a great sphere, divided and demarcated into terrestrial and celestial regions. It is geocentric and contains concentric spheres. Within its inner or terrestrial region, the natural place for the motionless Earth was at the center of the universe, surrounded by water, air, and fire. In the celestial region, there were seven “wandering stars,” that is, Moon, Mercury, Venus, Sun, Mars, Jupiter, and Saturn. The fixed stars beyond those seven wandering stars were made up of ether and were considered eternal and unchanging (Lindberg 1992, ch. 3; see Figure 1).

Aristotle also worked out the first system of logic in the *Organon*, in which he presented his idea of science and the explanatory structure of demonstrative knowledge in the *Posterior Analytics*. The most perfect scientific knowledge is a proof through the proper, immediate, or true cause or reason for a fact or an effect. He thus used mathematical proof as his model to define true knowledge as deductive demonstration. Such deductive demonstration comes from principles, axioms, definitions, or hypotheses with premise(s) to explain phenomena, prove conclusions, and describe or predict the position of wandering stars.

In Aristotle's classification of the sciences, there are theoretical and practical sciences. Theoretical sciences include natural philosophy, mathematics (including astronomy), and metaphysics. Practical sciences have something to do with human choice or behavior, such as politics, ethics, and economics. Each science has its own principle. Natural philosophy, a branch



**Figure 1.** Chinese Depiction of Aristotle's Two-Sphere Model of the Cosmos.

of theoretical sciences, is thought to be totally different from politics, ethics, and economics.

Under the influence of Aristotle's idea of science, Euclid (*fl.* 300 BCE) synthesized earlier mathematics into his *Elements*, and Claudius Ptolemy (*c.* 90–*c.* 168 CE) did the same for astronomy in his *Almagest*. Based upon Aristotle's natural philosophy—especially the two-sphere model of the cosmos—Ptolemy established Western astrology in his *Tetrabiblos*, emphasizing celestial influence on the terrestrial earth and humans.

*Comets as a normal phenomenon in the sublunar region.* In the *Meteorologica*, Aristotle used his idea of the natural motion of four elements to explain hundreds of natural phenomena within the terrestrial region. Comets are one of the normal phenomena in this terrestrial region.

Before the seventeenth century, comets had not been recognized as stars with regular periods moving around the sun. Since comets appear outside of the zodiac, they could not be wandering stars like the Moon, Mercury, Venus, Sun, Mars, Jupiter, or Saturn. Aristotle believed that comets were an atmospheric phenomenon, originating from dry, warm exhalations of oily air that emanated from the earth, naturally moving toward the Moon, and igniting near the region of fire (Heidarzadeh 2009, ch. 1). Thus, comets were explained as a normal phenomenon in the terrestrial region in Aristotle's natural philosophy (see Figure 2).



Figure 2. Comet as a Normal Phenomenon in the Terrestrial Region.

*Natural theology.* In the second century, Christianity spread over the territory of the Roman Empire. Since ancient times, the book of Genesis in the Old Testament has been closely associated with the Christian religion and science in Western civilization. How could theologians explain that the Lord created the physical universe, living things, and Adam within six days? They had two choices at that time. One was to study nature by themselves, and the other was to borrow from pagan Platonic or Aristotelian natural philosophies. The early church fathers chose the latter (Lindberg 1986).

In the late Middle Ages, when Christianity became dominant in Western culture, the Aristotelian cosmology had been integrated with a Christian theology of Genesis as a Christianized Aristotelian worldview. Nature became the work of the Creator. It was thought that one may understand the Creator by way of his creation. This view became natural theology, a branch of learning by which to know the Creator. The Creator was seen as the most remote cause for the creation of the cosmos. Later, natural theology encouraged seventeenth-century “scientists” to pursue the natural laws to glorify the lawmaker, the Creator.

#### SCIENCE AND CONFUCIANISM IN CHINESE CIVILIZATION

In my opinion, looking for progress and regression in science and Confucianism is Whiggish history rather than the right way to understand the past, let alone learning something in order to see its meaning for the future. In contrast to Western science, which developed within the naturalistic thinking of Western civilization, Chinese science developed by the associative or correlative thinking of Chinese civilization.

*Chinese science developed by associative or correlative thinking.* It seems to me that the ancient Chinese looked to nature not for the sake of Nature itself. For example, Yung Sik Kim points out that mutual association “was

a key mode of explanation in Chu Hsi's discussion of natural phenomena," "the 'natural' world . . . was frequently invested with moral qualities" (Kim 2000, 315f). In Kim's opinion, Chu Hsi 朱熹 (or Zhu Xi), a prominent Neo-Confucian scholar of the Song Dynasty, was not concerned with nature itself; rather his interest was political and social. Derk Bodde (1991) also finds that ancient Chinese posited a moralistic view of nature.

*Analogy and the Way (Dao).* Scholars who have paid attention to ancient Chinese thought and Greek philosophy have found that the former emphasized *Dao* and the latter *Logos*. I will take *tian yuan di fang* 天圓地方 and *tian yuan di yuan* 天圓地圓 as examples to show that *Dao* and *Logos* are two different ways of expressing the relation of Heaven and Earth in these two natural philosophies. In contrast to *tian yuan* 天圓 representing the circular motion of celestial stars and *di yuan* 地圓 representing the spherical shape of the Earth, ancient Chinese thinkers understood nature in terms of analogy and according to *Dao*. By means of analogy, Confucius (孔子 551-479 BC) and his student Tzeng Zi or Tzeng Shen (曾參 505-435 BCE) expressed their understanding of *tian yuan* 天圓 as *tian dao* 天道 representing the way of the heaven and *di fang* 地方 as *di dao* 地道 representing its way of rest in order to encourage gentlemen to imitate their example by following their spirit, rather than learning them mindlessly as geometrical figures of the heaven and earth (Gao 1984, "Tzengzi Tian Yuan Di Wushiba 曾子天圓第五十八," 207). It reflects the Confucian emphasis on the relation of Heaven and human beings (*tian ren guan xi* 天人關係). Later, *tian yuan* 天圓 and *di fang* 地方 were used in a political context to represent *jun dao* 君道 (way of the emperor) and *chen dao* 臣道 (way of the courtier) respectively. Finally, *tian yuan di fang* 天圓地方 appeared in the *Zhou Bi Suan Jing* 周髀算經 (*The Arithmetical Classic of the Gnomon and the Circular Paths of Heaven*), a work concerning the circular paths of heavenly bodies and the measurement of the cosmos; thus the idea of *tian yuan di fang* 天圓地方 gets its mathematical and physical meanings (Hsu 2014).

*The natural philosophy of qi.* In 2000, Yung Sik Kim used the term "Natural Philosophy" to express Chu Hsi's natural knowledge in *The Natural Philosophy of Chu Hsi (1130-1200)* in terms of the "Theory of Ying Yang, Five Phases, and Qi" (*yinyang wuxing qi lun* 陰陽五行氣論). I propose that there is also a Chinese natural philosophy of *qi*, which has been modified, adjusted, and enriched through different times or ages up until the present.

The character 氣 (气 or 炁 *qi*) represents one of the most influential concepts in Sinic culture. Before the late nineteenth century, Chinese people believed that *qi* was the most fundamental substance composing everything in the cosmos, including material things, the human body, mind, or

spiritual soul. One can find the character 氣 (*qi*) in works on Chinese philosophy, medicine, astrology, military strategy (*bingshu* 兵書), literature, subject-based reference books (*leishu* 類書), almanacs (*tongshu* 通書), geomancy (*fengshui* 風水), and so on. I will focus on my understanding of the Chinese natural philosophy of *qi* and its implications from a comparative viewpoint of the history of science. One can say that Chinese culture is a kind of culture of *qi* with many ideas expressed in terms of *qi*, including fields of natural knowledge or so-called science.

According to the natural philosophy of *qi*, everything, including heaven, earth, the myriad of things, human beings, and so on is composed of *qi*, which moves everywhere in the cosmos. Thus, *qi* was seen as the most fundamental reality for Chinese in ancient times. I call this perspective the “Realism of *Qi*” (*Qi Shizhai Lun* 氣實在論), a phrase I coined.

As for the cosmogony of the world, or how the universe and the myriad of things are formed by *qi* through *yin/yang* and *wuxing* (five phases), Chinese *literati* usually took for granted that the universal dynamic *qi* will spontaneously form the visible things as we see them without offering any detail. Thus, I call this perspective “Natural *Qi*-ism,” (*Ziran Qi Lun* 自然氣論), another term I coined.

According to the imagination of Christian culture, the omnipotent Creator created the world by natural laws in six days. Likewise, according to the imagination of the Sinic culture of *qi*, the universal dynamic *qi* constantly moves and constitutes all the things we see. Compared with the Creator as first and final cause, we may say that Natural *Qi*-ism stresses the “efficient cause” of the universal dynamic *qi*.

*Ren qi* 人氣: *qi* issued from human beings. Among the different kinds of *qi*, *qi* that issues from people has been noted since ancient times.

According to the system of militarism employed in the Warring States Period (475–221 BCE), in order to know the fate of the country, two kinds of *qi* that issued from human beings were recorded and emphasized. There was one *qi* that issued from the battlefield (戰場之氣). For example, we find the following precept in Mozi’s *Ying Di Ci* (墨子·迎敵祠 Sacrifice Ritual during Encounter with the Enemy):

凡望氣，有大將氣，有小將氣，有往氣，有來氣，有敗氣，〔有勝氣，〕  
能得明此者可知成敗、吉凶。

Watching the physical form of *qi* above the camp of the enemy, appearing there are *qi* issued from admirals, young militants, withdrawing troops, coming troops, defeated troops, [victor’s troops]. One who can comprehend those above-mentioned *qi* will win and succeed and make the opponent lose and fail. (Mozi 1976).

Another form of *qi* is that issued from the emperor. The *Yi Si Zhan* 乙巳占 (Astrology Published in the Year of *Yi Si* [656]), published by Li Chun-Feng 李淳風 (602–670 CE), collects earlier Chinese astrological

records of the above-mentioned two kinds of *qi* that issue from people. It contains one chapter concerning *qi* that issues from the emperor and ten chapters related to *qi* that issues on the battlefield (Li 1987, jun 9, 147–60).

In addition, in the culture of *qi*, ancient Chinese developed a special astrology in terms of a special kind of “bad *qi*” (*li qi* 沴氣) produced by humans on the Earth’s surface, which was thought to bring disasters including rising up toward the stars, resulting *xing zhan yi xiang* 星占異象 (anomalous astrological phenomena).

*Wuxing Xiangli Zhi Qi* 五行相沴之氣. Beside the “mutual generation theory of the five phases” (五行相生) and the “mutual restriction theory of the five phases” (五行相剋), there exists a view of *wu xing xiangli zhi qi* 五行相沴之氣. *Li qi* 沴氣 is a kind of ominous *qi*, resulting from the different clashes of the “five phases” and causing different disasters in nature. According to the imagination of natural philosophy of *qi*, the emperor’s misbehavior or judgment caused different kinds of *li qi*. In his commentary on the *Documents* (*Shangshu* 尚書), one of the classics of Confucianism, Fu Sheng (伏勝 260–161 BCE) points out that, in the manner of ruling the court, if the Emperor does not respect his leading courtiers with a positive attitude (貌之不恭), follow their good suggestions (言之不從), distinguish between good and bad officials (視之不明), like to hear true opinions (聽之不聰), or make intelligent judgments (思之不睿), there will rise five *wuxing xiangli zhi qi*: *jin li mu* 金沴木 brings the damage of *mu qi* 木氣; *mu li jin* 木沴金 causes the damage of *jin qi* 金氣; *shui li huo* 水沴火 will damage *huo qi* 火氣; *huo li shui* 火沴水 does harm *shui qi* 水氣; *jin, mu, shui, huo li tu* 金木水火沴土 means *qi* of 金木水火 together reduces *tu qi* 土氣. By way of correlative thinking, the above-mentioned five kinds of *li qi* correspond to the following five kinds of disasters, such as xylon ice (雨木冰), nine sacred tripods shaking (九鼎震), ice nil (亾冰), heavy rain, snow, or hail-storms (大雨、大雪、雨雹), and earthquake or landfall (地震、山崩) respectively recorded in the *Spring and Autumn* 春秋. There is another kind of *li qi* which is most serious and reflects the “relations between human beings and heaven” (*ren tian guan xi* 人天關係). If the emperor makes all five mistakes, then comes *qi* of *jin, mu, shui, huo, tu li tian* 金木水火土沴天, which means ominous *qi* of *jin, mu, shui, huo, tu* will move together upward to the heaven and cause serious anomalous astrological phenomena such as comets and lunar or solar eclipses recorded in the *Spring and Autumn* 春秋 (Hsu 2009).

Similar to the early Western church fathers, who chose to borrow pagan Platonic or Aristotelian natural philosophies rather than study nature themselves, Han Dynasty Confucians like Dong Zhongshu (董仲舒) chose to borrow the view of *wu xing xiangli zhi qi* 五行相沴之氣 rather than investigate nature on their own (Dong 1975). In contrast to the relationship between science and Christianity, Dong Zhongshu and other Confucian literati borrowed the view of *wu xing xiangli zhi qi* 五行相沴之氣 to



reflect the negative relations among politics, ethics, and nature as a means of limiting the absolute power of the emperor.

#### THE COMET AS AN ANOMALOUS ASTROLOGICAL PHENOMENON

The Aristotelian two-sphere model of the cosmos was divided into celestial and terrestrial domains, but things in the latter could not move into the former. However, according to the natural philosophy of *qi*, everything, including the Earth and the Heaven, is composed by *qi*; indeed, “the whole world is full of *qi*” (*tong tian di yi qi* 通天地一氣).

As mentioned previously, an emperor’s failures may lead to ominous *qi* of *jin, mu, shui, huo, tu li tian* 金木水火土沴天. *qi* 五行相沴之, which issues from the people, is thought to move from the surface of the Earth up toward heaven and cause seriously abnormal astrological phenomena.

Comets are among the hundreds of abnormal astrological phenomena recorded in the *Kaiyuan Zhan Jing* (開元占經), a collected work published in the Kaiyuan Era (開元年間, 713–741) that contains previous records of astrology up to the Tang Dynasty. According to the view of *wu xing xiangli zhi qi* 五行相沴之氣, ominous *qi* of *jin, mu, shui, huo, tu li tian* will interfere with the regular movements of Jupiter or Venus and produce comets, as *Shi Ji* (史記) records in the *Tian Guan Shu* (天官書; Sima 1974, v. 27, 1328). Chinese shared this view of comets since ancient times. In late October 1577, the father of Zhang Juzheng (張居正, 1525–1582 CE) died in Jiang Ling (江陵) in Huguang (湖廣) Province. According to official protocols of the time, Zhang Juzheng needed to return home to take care of his father’s funeral and stay there for three years. However, he and the Wanli 萬曆 Emperor wanted Zhang to remain in Beijing. Thus, the Emperor ordered him to stay in his position, removing his filial obligation of going back to take care of the ceremony of mourning and the deathwatch of his father or mother; this act was called *duoqing* 奪情. During this period, the comet of 1577 appeared in the sky, and imperial advisors interpreted it as an anomaly with astrological implications due to the bad political decision of the Wanli Emperor and Zhang (Hsu 2009).

In contrast, the comet of 1577 was observed in Europe by Tycho Brahe (1546–1601 CE), who thought it had appeared above the Moon. Thus, it became a crucial anomaly in Western science that contradicted the Aristotelian view of comets as atmospheric phenomena.

#### THE ENCOUNTER, COMPARISON, AND COMPETITION OF CHINESE AND WESTERN SCIENCES

Soon after the great discoveries in world geography at the end of the Western fifteenth century, the Reformation and Counter-Reformation occurred in the first half of the sixteenth century. The Society of Jesus was founded in

1540. Beginning in 1582, Jesuit missionaries came to China to propagate Christianity by introducing the natural sciences. They thereby enabled the encounter, comparison, and competition of Chinese and Western sciences.

*The encounter of two traditional sciences.* Matteo Ricci (利瑪竇 1552–1610 CE), the most famous Jesuit missionary in late Ming China, learned about Chinese natural knowledge from his interactions with Chinese *literati*. At the same time, he introduced Western learning into China. In doing so, he facilitated an encounter between Chinese and Western sciences, such as the Jesuit view of air versus the Neo-Confucian view of *qi* (Hsu 2001), the four elements theory versus the five phases view, the Western view of the Earth as a sphere versus the Chinese view of the Earth as a square, and Chinese astrology versus Western astrology, as well as different explanations for solar and lunar eclipses, the generation of hail, comets, and so on.

*A comparison of two traditional sciences.* The transmission of Western learning by Ricci and other Jesuits had a great impact on some Chinese *literati*, who used Western learning as a reference to make an evidential study of traditional natural knowledge. Xiong Mingyu (熊明遇, 1579–1649 CE) was a good example. He wrote *A Draft on Regularity* (*Ze Cao* 則草) and *A Draft on the Investigation of Things* (*Ge Zhi Cao* 格致草) in which he distinguished two new approaches to traditional texts, reliable texts of traditional natural knowledge with evidence (*Ge Yan Kao Xing* 格言考信), and doubtful texts of traditional natural knowledge without evidence (*Miao Lun Cun Yi* 渺論存疑). Xiong was thus the pioneer of the seventeenth-century evidential study of Chinese natural knowledge. Based upon Western learning of Aristotelian natural philosophy, he regarded ominous *qi* of *jin, mu, shui, huo, tu* moving together upward to the heaven and causing abnormal astrological phenomena as groundless; for instance, comets as atmospheric phenomena happened in the sublunar region (Xiong 2014).

In the past, scholars have proposed many answers to the question, “Why did the scientific revolution not happen in China?” However, it seems to me that no one has approached this question from the viewpoint of natural philosophy, let alone from a comparative viewpoint of history of science. In *The Structure of Scientific Revolutions*, Thomas Kuhn describes Aristotelian natural philosophy as a pre-paradigm in the Middle Ages and Renaissance. However, there were several anomalies, such as the 1572 nova, the 1577 comet, Galileo’s five discoveries in 1609–1610, and sunspots, which challenged the credibility of Aristotelian natural philosophy and opened a great space for a new paradigm.

Since the 1970s, Chinese scholars began to be familiar with the ideas of paradigm, anomaly, and scientific revolution elucidated by Kuhn. Indeed,

some scholars have tried to borrow the term “paradigm” from Kuhn and wondered if “Theory of Ying Yang, Five Phases, and Qi” might be the “paradigm” of Chinese science. The adoption of yin *qi* and yang *qi* not only excludes coherence and consistency as criteria for scientific explanation, but also hardly permits any anomaly for the *Yin-Yang Wuxing Qi Lun*.

As I mentioned before, there is a Chinese natural philosophy of *qi*, which has been modified, adjusted, and enriched through different times or ages, but it has never been revolutionized. From our comparative analysis of two sciences, I offer the following list to show my comparison of natural philosophy of *qi* with Aristotle’s natural philosophy.

**Table 1.** Comparison of the natural philosophy of *Qi* with Aristotle’s natural philosophy

	Natural philosophy of <i>Qi</i>	Aristotle’s natural philosophy
Way of thinking	Correlative	Naturalistic
Focus	Politics	Natural Phenomena
Idea of science	None	Aristotle Proposed
Unity	Inconsistent	Consistent
Explanatory structure	None	Aristotle Proposed
Anomalies led to	Political Concern	Scientific Revolution

*The competition of two sciences.* Matteo Ricci made efforts to replace the five phases (*wuxing* 五行) with the Aristotelian four elements in his *On Four Elements* (*Si Yuan Xing Lun* 四元行論). So far as I know, much earlier Shao Yung (邵雍, 1011–1077 CE) had introduced a minority perspective called *di zhi si ti* 地之四體, that is, *shui* (water), *huo* (fire), *tu* (earth), *shi* (stone) 水火土石, to challenge the dominant view of the five phases. Although Ricci did not succeed, he knew this commentary and appropriated it to transmit Aristotle’s four elements as “bodies” (*ti* 體) which comes into being earlier than its function and regarded five phases *wuxing* as “functions” (*yong* 用) of Aristotle’s four elements (Hsu 2007).

Since the late sixteenth and early seventeenth centuries, although the transmission of Western science to East Asia brought it into encounter, comparison, and competition with Chinese science, there was no decisive victory for Western science until the second half of nineteenth century, when Western technology based on science was demonstrated through the power of military weapons and ships. Thus, it was scientific technology (or technology based upon science) that persuaded Chinese to believe that Western science and technology were superior to traditional Chinese science and technology.

## SCIENCE AND CONFUCIANISM IN THE AGE OF SCIENTIFIC TECHNOLOGY

Although the seventeenth-century scientific revolution has been praised as a great achievement in the development of science, Carolyn Merchant (1980) has also criticized it as the beginning of the *Death of Nature*. She reassessed the scientific revolution not as a marker of progress but as the domination of nature. She claims that Francis Bacon's rhetoric legitimated the control of nature that brought about the modern ecological crisis. If science is a conceptual system, how could it cause the modern ecological crisis?

In the nineteenth century, which has been called "the age of science" (e.g., Knight 1986), we see that many branches of science developed from natural philosophy and became fields of study or high technology; that is, technology on the basis of science, that moves the whole world, including the traditional Confucianism of the East Asian world, toward modernization. If technology means that humanity realizes its ideas in material things, and traditional technology is that which is made by human hands with instruments, then scientific technology produces machine tools first and uses them for mass production.

According to such a mechanistic worldview, scientific technology becomes the mainspring of economic growth. But the atmosphere of the Earth is reflecting a kind of crisis evident, for example, in air pollution, smog, dust storms, global warming, or climate change. Chemicals are common environmental pollutants, and carbon pollution is the main reason our Earth is getting hotter, thereby increasing the likelihood of weather disasters.

By the early twentieth century in China, however, Confucianism was criticized as conservative and regressive, and many scholars and ordinary people believed it to be responsible for stunting the development of science and democracy. Confucianism suffered greatly during the late nineteenth and early twentieth centuries. As Levenson (1965) points out, modern science could not develop from a traditional Confucian society.

As I mentioned above, similar to the early Western church fathers who chose to borrow pagan Platonic or Aristotelian natural philosophies rather than study nature by themselves, Han Dynasty Confucians like Dong Zhongshu 董仲舒 chose to borrow the view of *wu xing xiangli zhi qi* 五行相沴之氣 rather than study nature by themselves. Just as the goal of Christian religion was not to develop science, so the purpose of Confucianism was not to develop science. What might we learn from studying the science and Confucianism of the past? What prospects might we expect from the future study of science and Confucianism? I will first mention the universal benefit of the Hippocratic Oath, and then turn to the positive aspects of the Confucian belief in the intimate relation between politics, ethics, and nature.

*The Hippocratic Oath as a universal benefit for human beings.* Because of its basis in Greek natural philosophy, Greek Hippocratic medicine has been regarded as a rational medicine. Scholars widely believe that one of the students of Hippocrates, often called the father of medicine in Western culture, actually wrote the oath. The oath requires the medical doctor to teach his art to students without reward and imposes a duty to cure all kinds of people, regardless of social rank.

The oath has been regarded as the root of medical ethics. Although it has been modified in the past, modern professional doctors use medical technology along with this medical ethic, for the end of making patients feel more comfortable. In my opinion, the Hippocratic Oath is a universal benefit for human beings.

*Positive Confucian belief in politics, ethics, and nature.* As I mentioned above, in order to limit the absolute power of the emperor Han Dynasty Confucians chose to borrow the view of *wu xing xiangli zhi qi* 五行相沴之氣 to introduce the potentially negative relations that may exist among politics, ethics, and nature, reflecting on abnormal phenomena to warn the emperor to correct his misbehavior.

But there also exists a positive relation between politics, ethics, and nature. In the Yao Dian 堯典 of the *Shangshu* 尚書 (The Document), Emperor Yao made efforts to seek harmony between politics, ethics, and nature. Good politics must follow the natural order of the seasons and provide benefits for the people. This is the positive Confucian belief in the intimate relation between politics, ethics, and nature.

In light of the crisis of air pollution or of global climate change, I think we may reinterpret the negative Confucian relation between politics, ethics, and nature, thereby reflecting on abnormal phenomena as a warning about collective misbehavior in our use of modern scientific technologies. If we want get back on the right track, we need to introduce a positive Confucian belief in politics, ethics, and nature, whereby political leaders should seek harmony between politics, ethics, and nature.

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