

**COMMITTEE VI**  
Eastern Approaches to Knowledge and  
Values: With an Emphasis on "QI"

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**Discussant Paper on Wu Huan Pei's Paper**

**COMMENT ON "THE QI THEORY OF CHINA AND MODERN SCIENCE"**

by

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## I.

China and perhaps the Orient in general created their own traditional science in the past, and it was quite different from modern science. It emphasized strictly to reason deductively from the given principles and axioms. There was no mathematical system comparable to Euclidean geometry.

However, the four major inventions of mankind, i.e., paper making, gunpowder, printing and marine compass, as well as seismograph and rocketry were made by the Chinese.

These inventions were transferred to Europe during the renaissance and contributed greatly to the building of the basis upon which modern European science was created. But these inventions made no direct contribution to the development of modern science as represented by modern European mathematics.

There were some fields of science wherein the Chinese distinguished themselves such as meteorology and magnetism. Here, air current, high and low atmospheric pressure and magnet were understood as fluids, and Qi as the ying and the yang which provided undulating wave models.

In the history of world mathematics, the Chinese first discovered the notion of minus(-) and applied it to real number theory. This was found in the Jiuzhang Suanshu (Mathematics in Nine Chapters) of the Chin-Han period (221 B.C. to 9<sup>C</sup> A.D.)

The traditional Chinese philosophy is founded on the ying and the yang which in turn rest on Qi. This can be expressed mathematically as  $- +$  theory (theory of the negative and the positive).

The Greeks dealt with geometrical figures in mathematics. This compares with the Chinese <sup>to</sup> tried to systematize mathematics with the theory of equation.

The Chinese (particularly) were gifted with talent in individual and concrete description of objects and their classification by patterns. This was why Hegel referred to the "Chinese spirit of classification."

The great development of Chinese herb medicine was also due to this way of thinking. Almost all the old Chinese books on science and technology follow this principle of classification. The Chinese understood diverse phenomena as they were and negated to generalize and abstract them. This method was effective when they dealt with organic objects with individuality.

## II.

The theory of the ying and the yang is not effective in all fields of science. Rather, it can be said that in comparison with modern European science, Chinese science has few outstanding features. Because of their effort to grasp an object with the impalpable Qi the Chinese failed to build a modern mathematics.

The notion of Qi is omnipresent in all Chinese philosophy. It first appears in the inscriptions on bones and tortoise carapaces and reveals the primordial Chinese view on life in the Yin-Chow<sup>u</sup> Period (18-7<sup>c.</sup> B.C.)

In the philosophies of Chutzu Pochia (7th-3rd c., B.C.) of the warring state period, the Qi in humans rapidly proceeded to that in nature. Then in the theory of Li during the Han dynasty (3rd c., B.C.-1st c., A.D.), it took on a character of natural philosophy. In the Sui-Tang period (6th-9th c., A.D.), the Qi became an important element in the then prevalent Taoism, a mystic religion, and was applied both in philosophy and magic. The Qi was transformed into

the neoconfucianist philosophy of Li Qi during the Sung-Ming period (10th-16th c., A.D.).

The Qi was conceived as something making clouds, something in human breath, human soul itself, and as something magic. Then it began to be thought of as dynamic energy that is the fountain of life. Thus the Qi was regarded as creating all things -- as energy giving life to humans and animals. In this way it was applied widely in Confucianism, Buddhism and Taoism.

Particularly in the philosophy of Li Qi advocated by Chutze and Wang Yang-ming, the Qi became the foundation of its systematic ontology. It is considered difficult, however, to apply this Qi in modern science.

### III.

In the concrete description of individual objects and their cognition through classification, the Chinese resorted to bipolar classification. The 64 patterns in I-Ching (The book of change) ~~embrace~~ <sup>connote</sup> almost all natural phenomena in abstract conceptions and the process<sup>es</sup> of their change. This is the binary classification using the two lines represented by the Ying and the Yang. The alternation of the ying and the yang for six times, ~~it~~ becomes the combination of

$$2^6 = 64.$$

Thus it replaces all natural phenomena by mathematical symbols. Leibnitz and other European scholars were amazed at this.

The modern computers are based on the binary numerals, which

first drew the attention of Leibnitz. He was interested in universal mathematics and universal symbols, and also endeavored to develop modern logic. But his activities were not directly related to the development of electronic computers. The relationship between I-Ching and electronic computers does not go beyond that between Leibnitz and electronic computers.

#### IV.

Modern science rests on the bedrock of mathematics. Ever since Plato and Pythagoras, European scholars have believed that the universe could be cognized by mathematics.

Chutze based his philosophy on Qi and conceived a quality derived through its operation <sup>Li</sup> or the quality of pattern. "Where there is Qi, there is Li, and vice versa." Or "If there are Qi and form, there are ~~numbers~~<sup>numerals</sup>" The operation of Qi changes from activity to inactivity, from inactivity to activity, from progression to retrogression, and from retrogression to progression. Each change has its limit. The change of seasons, the changing phase of the moon and the alternation of day and night all have their limits, and can be shown by numerals.

However, the Chinese notion is fundamentally different from the western view of mathematics.

The modern science founded on the Greek tradition has a deductive inference system in which cognition is made by establishing a principle from which to proceed to reasoning. In modern mathematics, principles are formulated by numerals and truth and falsehood are judged by the result of a test.

The "mathematical principles" used by Chutze and other Chinese philosophers were based on the rules of classification from which individual and concrete description is made and understood in terms of fundamental constants.

## V.

Certainly, modern science is faced with a crisis, Nuclear energy, pollution, biotechnology, etc. which could drive mankind to destruction are all products of Western Science. This has called for the rediscovery of the possibilities of Eastern science and the reexamination of national cultures. The study of traditional thoughts and science has taken on its importance not as a study of the good old days but as that of the realistic present.

However, this does not mean that we seek an alternate solution in Eastern thoughts now that western view of the world has revealed its limits. The contradictions built in western science and possibilities of Eastern science should now be reexamined in light of scientific philosophy and scientific methodology.

In recent years, New Science has arisen, stressing a biological, not mechanical, view. In recent biological sciences, the concept of a self-organizing system is stressed. Included in this view are symbiotic theory of evolution which negates the principle of the survival of the ~~fit~~<sup>test</sup> and natural selection, and Gaia hypothesis which views the universe as a biological system wherein organic and inorganic matters interact. The basic thought in this view is to regard nature as an autonomous and self-becoming system in lieu of a mechanistic doctrine of elements.

Out of this, a world view has developed to grasp the creation of the universe, the creation and evolution of life and even the formation of culture in terms of a self-organizing system. This sharply contrasts with the traditional heteronomous, deterministic and mechanistic Weltanschauung, governed by the doctrine of elements, and viewing nature as a lifeless clockwork.

Now, humans, the universe and even earth are thought to have a life, and to be ceaselessly breathing and evolving.

Humans are but a tiny part of this life called the universe.

In the human body there are hundreds of millions of cells each of which has its own life in supporting the whole. Likewise, earth is a living cell and goes on living keeping a delicate harmony as J.E. Lovelock said.

According to him, the atmosphere is controlled by the biosphere, and inorganic and organic matters on earth constitute a cybernetic system to maintain homostasis. This was named Gaia hypothesis after the great-mother in the Greek myth.

"In the world, there exist no two things which do not have the mutual relationship of "I" and "Not-me." Both "I" and "Not-me" act for themselves. East and west stand in extreme opposition. Yet they are like lips and teeth. To act for one self is also to act for others. They are mutually opposed, yet they do not negate each other."

(Chuangtze)

Humans are certainly living cells of the living earth.

This corresponds to Laotze-Chuangtze philosophy and proves that the oriental reasoning that "heaven and earth combine with the ~~chi~~<sup>qi</sup> to create everything" is not only a philosophical premise but a scientific truism.

## VI.

This does not mean that Chinese thought connotes western science and thought. Oriental thought should be examined anew in light of the present, but we should bear in mind that Oriental science cannot connote western science.

The present crisis is the natural outcome of western science, and it should be overcome on the higher plane of philosophical system which connote both modern science and oriental thought.

I have read prof. Pei's paper with deep interest and this theory of Qi field has drawn my close attention. However, we should not be led to think that Qi theory alone could solve the problems which modern science has failed to do.