CHAPTER FIVE

CONCLUSION

From what has been discussed, we may in fact say that Chinese scientific thought is obviously closely related to their natural philosophy. A serious treatment of Chinese science cannot begin with a chronicle of theories or discoveries, instead, one must begin at a more fundamental level, in order to understand a different conceptualization of the world view in this tradition. An understanding of the indigenous Chinese worldview requires an exposition of ideas in natural philosophy, especially from its Taoist origin, that shaped the Chinese world picture.

We must admit that traces of interest among the early Confucians in natural science are few. They were primarily concerned with human and social affairs. On the other hand, it is very common to identify Taoism as a stream of thought that takes the questions of Nature as its dominant focus. From what has been discussed, we noticed that the naturalistic conception of the universe, as it was germinated in Daode Jing and Zhuang Zi, and more fully developed in subsequent centuries, has been a most important philosophical heritage from the pre-Qin period. It is quite apparent from a variety of evidence that the cosmology expressed in Daode Jing and Zhuang Zi
had very great impact on Chinese scientific thought and produced a unique Chinese science.

The Chinese world-view depended upon an entirely different line of thought. As we have said the *philosophia perennis* of China was an organic naturalism. Therefore, the mechanical view of the world did not develop in Chinese thought, but the conceptualization of Nature which was a non-mechanistic, non-legalistic, unified and interrelated organism, was universal among Chinese thinkers. This world-view determined and characterized the subsequent developments of Chinese scientific thought. This also led to some fields of science being particularly well developed in ancient and medieval China, such as the three branches of physics - optics, acoustics and magnetism, and to the neglect of others such as mechanics and dynamics which were relatively advanced in the West. In particular, we can say that the Chinese physics was loyal to a prototypic wave theory, which was closely bound up with their organic naturalistic thinking and perennially averse to atoms.

As we have remarked, *Daode Jing* is the first work to depict the cosmos as an amoral, impersonal Nature. Its world is an uncreated universal organism, an interconnected, unified and self-maintaining whole. This holism is symbolized by the word *Dao* that is the Order of Nature and worked in profoundly organic way in all its operations. It would appear that the invention of the technical term, *Dao*, was one of the more important achievements of Lao Zi in his transformation of archaic mythology into natural philosophy. *Dao* is organic, unconscious and spontaneous. Therefore, it appears to have a strong influence on the shaping of the organic features of Chinese science.
During the Zhanguo period, the Guan Zi made an advance
development of the view of qi monism from the Daode Jing's concept of Dao. Qi
which places emphasis on wholeness, connectedness, formlessness, conversion and
dialectics as its fundamental keys, plays an exceedingly important role in almost every
branch of Chinese science. From what has been discussed, it is frequently used in
Chinese life science in a very subtle way to describe the various patterns of flow and
fluctuation in the human organism, as well as the continual exchanges between
organism and environment.

In short, Chinese science took a totally different line of thought from
that in the West. The atomistic theories never took any root in Chinese scientific
culture. As Needham pointed out that when the people of Greece developed the theory
of mechanical atoms, the Chinese follow by developing a philosophy of an organic
cosmos.¹ This organic world picture had led the Chinese to a science of organism.

We know that the Western view was characterized above all by an
external Creator external to the cosmos itself. Therefore, the main problem of their
science was to discover the laws laid down by the Creator for the ordering of the
cosmos. This led the West to develop the atomistic-mechanistic model of causality.

While Western scientists make predictions and explanations on the
basis of causal laws, the Chinese scientists make predictions and explanations on the
basis of dialectical laws. For them, the general principles governing changes are
basically dialectical. The dialectical reconciliation between the two complementary
polarities of yin and yang as a process of return and reversal, which is so often seen in
Chinese science, appears with much clarity in the Daode Jing and Zhuang Zi.

Daode Jing and Zhuang Zi are essentially scientific in outlook. This scientific outlook has led to many Taoist observations on and theories of natural phenomena. As noted earlier that the Taoist central concept is that of the Dao, thus they concentrated their attention fully on the observation of Nature in order to discern the 'characteristics of the Dao.' They insisted that the observation of Nature required a receptive passivity which the Taoist key term 'wu wei' symbolized. This careful observation of Nature had led the Taoist to profound insights of Nature.

From what has been discussed, we notice that one of the deepest scientific insights of the Taoists was the realization that transformation and change were essential features of Nature. Change was the universal mode of the Dao. Therefore, transformation and change did constitute a central issue in Taoist naturalistic thinking. Nevertheless, they were especially impressed by cyclical change. It is worth recalling here that the Chinese notion of qi, which represents the principle of flow and fluctuation, is always cyclical. As we have seen, this pattern of cyclical change was extensively used to interpret a wide range of natural phenomena in Chinese science, especially in Chinese medicine and alchemy.

Science today has made tremendous progress and has a strong effect on people's attitudes toward the natural environment. As we know ecosystems sustain themselves in a dynamic balance based on cycles and fluctuations, which are non-linear processes. Thus, "Ecological awareness will arise only when we combine our rational knowledge with an intuition for the non-linear nature of our environment," writes Capra. Such intuitive wisdom tends to be holistic and non-linear.

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Among the Chinese philosophical school, Taoism that involves the idea of their thought involving cyclical recurrence and organic unity, offered one of the most profound and most beautiful expressions of ecological wisdom. The simple-sounding prescription of Daode Jing and Zhuang Zi's 'compliance with Dao' shows that the Taoists behaved in harmony with Nature. Their patterns of thought and behaviour which include the love and study of nature, action without self-assertion, development without domination were in strong contrast to Occidental disposition to combat and conquer Nature.

The Taoist ideas that of 'follow the natural order' and 'flow in the current of the Dao' were firmly rooted in Chinese scientific thought. Although the Chinese technological advances and inventions were far advanced over any other civilization in the world especially from the first to the fifteenth centuries AD., they did not cause any severe degradation of the natural environment.

Here, we may conclude that the organic worldview of Daode Jing and Zhuang Zi not only shaped the Chinese world picture, but also continued to exert a tremendous influence on Chinese scientific thinking at a very fundamental level. We found that the mode of traditional Chinese scientific thought which involved interrelation, cyclical recurrence and organic unity, was much related with the way of Taoist thought. Hence, it is quite natural that certain fields of science were dominant in this culture whose natural philosophy was tied so closely to the concept of organism, interrelation of parts, pattern and resonance.

Although the thought of Daode Jing and Zhuang Zi played a vital role in Chinese science, it has some weaknesses. As we know Daode Jing and Zhuang Zi emphasized the oneness and integrity of Nature. Unfortunately, the Taoists were
perhaps integrated too completely into the Nature (cosmic organism). Therefore it may have hindered further initiatives to experiment with and to control Nature. On the contrary, the Western scientists not only stood apart from Nature, but also developed a new method of inquiry to 'measure' Nature from outside.

Exactness and verification is one of the foundation stones of science. Although the Taoists often talked of everything under the sun, in their understanding of the world, they were rather abstract, obscure, and lacked the bold conjecturing genius of the ancient philosophers of Greece. They failed to reach any precise definition of a deliberate methodology of scientific investigation and technical terminology.

Again, because they were extremely interested in Nature, they tended to distrust reason and logic, and did not apply mathematics to formulate the regularities in natural phenomena. Therefore the workings of the Dao tended to remain somewhat inscrutable.

Every civilization has its own science. However, because modern Western science has had such a tremendous impact on the world, we are apt to forget other civilizations' remarkable achievement in science. The Cartesian division (between mind and body) and the mechanistic worldview were extremely successful in the development of classical physics and technology. They had a tremendous influence on the general Western way of thinking up to the present.

Nevertheless, at the end of the nineteenth century, the basic ideas underlying Newtonian physics were found insufficient to explain all natural phenomena. In fact, the universe was far more complex than Descartes and Newton had imagined. Many scientists found that their new discoveries could not be explained
in mechanical terms, when they extended the range of their investigations into the realms of atomic and subatomic phenomena, as well as of electric and magnetic phenomena.

Now, some Western scientists’ are turning to the Eastern view of Nature, looking for a theory and wisdom. They notice that the concepts of modern physics often show surprising parallels to the ideas expressed in the philosophy of the Far East. As Niels Bohr pointed out,

“... For a parallel to the lesson of atomic theory...[we must turn] to those kinds of epistemological problems with which already thinkers like the Buddha and Lao Zi have been confronted, when trying to harmonize our position as spectators and actors in the great drama of existence.”

We know that the unification of opposite concepts has been emphasized most extensively by the Daode Jing and Zhuang Zi in their symbolism of the archetypal poles yin and yang. These concepts in modern physics can be found at the subatomic level, where particles are both destructible and indestructible; where matter is both continuous and discontinuous, and force and matter are but different aspects of the same phenomena.

Dao, from the Taoist point of view, a void which has an infinite creative potential can easily be compared to the quantum field of subatomic physics. As the quantum field, it gives birth to an infinite variety of forms, which it sustains and, eventually reabsorbs.

The physicists today are more often asserting a ‘belief in a total interrelation, of all aspects of the universe, large and small..., that the total puzzle is

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an interconnected whole." We noticed that this comes very close to the Eastern's worldview. As Capra pointed out,

"The further we penetrate into the submicroscopic world, the more we shall realize how the modern physicist, like the Eastern mystic, has come to see the world as a system of inseparable interacting and ever-moving components with man being an integral part of this system." 5

Nevertheless, it can even be said that this close connection is most clearly expressed in Taoism.

The world of science today comes very close to the Taoist worldview. As Dr Lin Yutang said, "It seems that the great truths of the world have been by the wise men of all ages, regardless of country and period. Dr Millikan, Einstein, Eddington, Emerson, Lao Zi and Zhuang Zi, with different backgrounds and possessing different tools of knowledge, come back to nearly the same thing." 6 The study of the Daode Jing and Zhuang Zi is as lively as ever. Regardless of what shapes things may take in the future, the Daode Jing and Zhuang Zi will continue to provoke thinking and to be a source of inspiration for the Chinese and the rest of the world as well.

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6 The bootstrap scheme which was advocated by Geoffrey Chew (Chew, G.F., The Analytic S Matrix, New York:Benjamin, 1966: passim.), is an especially obvious example of the importance of above-mentioned interrelation. In this bootstrap hypothesis, the universe is seen as a dynamic web of interrelated events and cannot be understood as an assemblage of entities.