

## The Meaning of Science in Oriental Mind

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### Introduction

There is an old saying in the Orient, On Go Ji Shin ( 溫古知新 ). It means, "Preserve the old to know the new." Intellectuals today entertain apprehensive feelings that the world is facing the worst crisis since Adam and Eve. The voice of distress is heard from many directions. People of Roman Club foresee the limit in material growth to predict the catastrophe of the earth. Scientists gathered at Pugwash, Canada denounce not only nuclear weapons but all the conventional weapons whatsoever. Many religionists through their churches and meetings anticipate the coming of the latter days of the world and warn against the corruption of the moral standard of mankind. The public at large cannot help the feeling of crisis that arises from the lack of balance between the material and spiritual culture.

The source of this kind of acute feeling, of course, may appear to differ among peoples, but in my opinion, it is caused by the failure of human individuals and groups to digest the explosive amount of new informations and new products accompanying rapid changes of social, cultural, economic and moral systems.

"Science," the new idea that arose in the 17th century West, has taken the most rapid progress surpassing all other ideas of sages and philosophers of the past in both the East and West. Today in the 20th century the result is the continuous production of unlimited amount of new knowledge. Especially during the past fifty years, new technical revolutions have broken out in every decade, and we have been obliged many times to change our ideas and philosophies with

aspect to nation and religion as well as our way of living and moral standards. Moreover, many factions of races and nations have declared self-independence based on the idea of the supremacy of science and economic development, and the road to modernization, industrialization and post-industrialization is taken to be an ultimate course of civilization, upon which the advanced as well as the underdeveloped countries must compete with one another to keep in the lead. Through this kind of historical process, every nation has set the national interest as her utmost goal, and today's world is necessarily accelerating toward catastrophe riding upon not only the battle of arms but the battles of trade, capital, ideology, religion, racialism, territorialism, etc.

This phase of today's world is sometimes likened to the Age of Civil Wars of China (B.C. 770-221), and it is suggested that the problem may be solved through the establishment of a unified philosophy of the world. More people, however, tend to think that such a universal philosophy cannot be realized, and rather than to seek a universal philosophy, it is better to rediscover the philosophies that have been developed among peoples and nations through all the past ages.

Considering the problem of today, I would like to present here the science of oriental philosophy in its essence with a special attention given to the long-neglected Mo-Tzu's ( 墨子 ) philosophy, then rediscover its merits as a possible solution to the problem.

#### The Main Stream of Oriental Philosophy of Science

A unique thing about Oriental philosophy is, regardless its origin, to consider the science culture and the literary culture as one harmonious thing and not to separate them. It may have resulted from the tendency to look at human ethics and morals in terms of natural laws and in turn to explain natural

principles in terms of human feelings. Essentially, however, it is the consequence of an attempt to seek the beginning point of the whole phenomena of human and nature within a unified philosophical system. Ancient chronicles show that the backbone of the Oriental thoughts such as the idea of Tao ( 道 ), Yin-Yang theory ( 陰陽說 ) and Five Elements theory ( 五行說 ) appeared prior to B.C. 2600. The first legendary Emperor in China, Fu-i ( 伏羲 ), derived the world creation thought, and Yellow Emperor, Huang-ti ( 黃帝 , B.C. 2,600) had derived the dual power of Yin and Yang theory and Five Elements theory. Lao-tzu ( 老子 ) and Confucius ( 孔子 ), who were the famous philosophers six centuries before Christ, arranged and systemized the Oriental thoughts up to their time in their books. The Book of Changes (Chou-Yi, 周易), which was originally described by Confucius and lately supplemented by Che-tzu ( 朱子 , A.D. 1130-1260), mentions that the man of gentle is such a man that his virtue is consistent with heaven and earth, his brightness with sun and moon, his order with four seasons, and his fate with spirit.

The original point of our oriental thoughts started from Taoism, the principle of which is to form a picture of the cosmogony or philosophy of the origin of the world. In other words, the conception of Taoism is similar to the following quotation out of St. John's Gospel, part 1, "In the beginning was the Word, and the Word was with God, and the Word was God." To express it in more familiar terms, the conception of Tao is the way, and is also subdivided into the Tao of heaven, the Tao of earth, and the Tao of man; for it is one fitting into the other as an indivisible entity. The following is quoted from Lieh-tzu ( 列子 ), the oldest author who proposed a theory of creation. "---starts from chaos, in which the three primary elements of the universe—force, form and substance—were still undivided. The first stage is followed by a second, the great inception, when force becomes separated; then by a third, the great beginning, when form appears; and a fourth, the great homogeneity, when substance becomes visible. The light and pure substance rise above and form heaven, the

avier and coarser sink down and produce the earth."

This concept of the division of substance into a lighter and a heavier part is one of the many forms which express the origin of oriental peoples belief in a dual power. The two components of the dual power were designated as Yin and Yang. The two characters which stand for Yin and Yang have received a vast variety of interpretations, but by analyzing the ideographs themselves the original and basic meaning of the character can be ascertained. A literal translation of the components that constitute the two characters result in the meaning of the shady side of a hill for Yin and the sunny side of a hill for Yang. Therefore, Yang stands for sun, heaven, day, fire, heat, dryness, light and many other related subjects; Yang tends to expand and to flow upwards and outwards. Yin stands for moon, earth, night, water, cold, dampness, and darkness; Yin tends to contract and to flow downwards. As heaven Yang sends fertility in the form of sun (and rain) upon the earth; hence heaven's relation to earth is like that of man to wife, the man being Yang and the wife being Yin.

Day changed into night, light into darkness, spring and summer into fall and winter. From these most striking and regular manifestations, it was deduced that all happenings in nature as well as in human life were conditioned by the constantly changing relationship of these two cosmic regulators.

A few more examples showing their extension from the physical to the moral, from the concrete to the abstract, may be instructive. Yang: motion, hence life; Yin: standstill, hence death. Yang: high, hence noble; Yin: low, hence common. Yang: good-beautiful; Yin: evil-ugly. Further contrasts are: virtue-vice; order-confusion; reward-punishment; joy-sadness; wealth-poverty; health-disease.

In these contrasts, Yang represented the positive and Yin the negative side. It must always be borne in mind that Yin and Yang were conceived of as one entity, and the both together were ever present.

In this sense, the Yin and Yang theory derived from Taoism is very much

similar to the interpretation of dualism in quantum theory of physics, in which light should have both corpuscle and wave properties. It is clear, of course, that whenever they make their appearances, corpuscular character and wave character of light come out separately, but they are essentially inseparable.

The idea of Yin and Yang is also sometimes compared to Hegel's idea of thesis, antithesis and synthesis. Hegel tried to present the formation of the whole through the relationship between nature and spirit, based upon the formula of thesis and antithesis. To him, thesis was not against antithesis, but was for antithesis, and together they resulted in synthesis.

We traced the close connection between Tao and Yin and Yang. However, for the analysis of Tao in regard to Yin and Yang, it is necessary to break down the concept of Yin and Yang into more tangible components. These tangible components, or creations, of Yin and Yang were the Five Elements; metal, wood, water, fire and earth.

The sequence of the Five Elements varied according to the viewpoint with which they were enumerated, for they were said to vanquish one another and to produce one another. Oriental philosophy explained the mutual victories of the elements in the following manner: wood brought in contact with metal is felled; fire brought in contact with water is extinguished; earth brought in contact with wood is penetrated; metal brought in contact with fire is dissolved; water brought in contact with earth is halted. Thus the sequence of subjugation is;

metal subjugates wood,  
wood subjugates earth,  
earth subjugates water,  
water subjugates fire,  
fire subjugates metal.

The sequence of creation is;

metal creates water,  
water creates wood,

wood creates fire,  
fire creates earth,  
earth creates metal.

The theory of Five Elements was philosophically as well as substantially different from Empedocles' Four Elements theory. If the four number of elements, water, air, fire and earth, could be modified to extend to 92 or 105 elements such as hydrogen, helium, etc., the Empedocles' four elements theory was consistent with the conception of modern chemistry in that all the materials are characterized according to their proportion of the compositions of elements.

On the other hand, the Oriental theory of Five Elements classified not only the whole universal matter as Mendeleev's periodic table classified whole chemical elements into eight groups, but it also classified the interactional relationships of the natural and spiritual world as well as the symmetrical relationships of the notional and physiological vitality of human beings, so that entire physical matter and spiritual phenomena did not exist beyond the boundary of the classification and also beyond the creation and subjugation sequence of the five elements. Co-ordination of the theory of Five Elements classified such items as flavors, odors, climates, musical scales, grains, animals, and many other categories in the names of five elements, wood, fire, earth, metal, and water.

The theory of Five Elements was extended not only in the natural world, but even in the human affairs concerning nations, politics and economics, as well as personal fate, so much that its desirable goal was always too far away to reach in lifetime. Even so, I do not doubt that the thoughts of Yin and Yang and the Five Elements theory have been very much inveterate among our oriental habits of spiritual, moral and practical living ways.

The outset of the idea of Changes, which occupied an important position in the Oriental philosophy of science, could be traced back as early as the times of Fu-i. This idea of Changes or Yi ( 易 ) began from the notion that the fate of a man or a nation changed according to the divination signs

which appeared upon burning tortoise shells. To express the signs on tortoise shells, eight figures called Kua ( 卦 ) were introduced through the combination of dual signs of — and -- , denoting Yang and Yin respectively. The eight figures were ☰ ☷ ☱ ☲ ☳ ☴ ☵ ☶ . These eight figures were further combined in two's to form 64 symbols, and six meanings were assigned according to the position and sequence of the six signs appearing in each symbol. Thus a total of 384 meanings were given to 64 symbols. From these meanings of symbols was derived the knowledge about the basic principles and changes of cosmos including human affairs and hence the destiny of all things.

#### Critical Review of Oriental Philosophy of Nature

Having started from the idea of Tao, the Oriental view of nature had its objectives not in the definitive understanding of nature itself but rather in the comprehensive harmony with its emotional, ethical and moral backgrounds. This is why the Oriental concept of nature failed to be "scientific."

Lao-tzu initiated the Oriental mind that true values were found only in the harmony between the ways of man and heaven or between the systems of life and cosmos. There was, however, a great difference between the concept of Confucius and Mencius ( 孟子 ) and that of Lao-tzu and Chuang-tzu ( 莊子 ). Lao-tzu and Chuang-tzu saw man as one equal entity as plant or animal within nature, whereas Confucius and Mencius saw man as the cause of morals with nature as its practical back-ground. While Lao-tzu and Chuang-tzu placed no distinction between man and nature, Confucius and Mencius put man at the center of universal nature only to be in harmony with the law of nature and to follow the will of heaven.

From the beginning, however, all the philosophy of nature in the Orient intrinsically bore an ambiguity in establishing its phraseology. Tao, the source of cosmogony and the center of order as mentioned before, reflected

different concepts at different times even for the same person. At times it is taken to indicate the way of seeking the enlightenment of order, while at other times as the cosmic order itself. Consequently, a vast variety of schools appeared with differing opinions of Tao.

Likewise, no clear terminological definition of Yin-Yang or Five Elements was ever given in deriving their concepts from Tao. A great number of illustrative books with different explanations were written by different scholars belonging to different schools, so that no one could ever completely understand them. Only after perusing the Three Classics ( 三經 ) and the Four Books ( 四書 ), the seven Chinese classics, could one barely pretend to understand the basic principles of Yin and Yang, and in the process of doing so, he became indulged with the great philosophy of Confucius, only never to surpass it to a critical idea or an advanced theory.

By the same token, in deriving 384 meanings from 64 symbols in the philosophy of Yi, there was no logic appropriate to modern mathematics. Meanings connected with cosmic principles and divination signs were assigned a priori by the great mythical power of Confucius, and the mystic ambiguity in its semantics was preferably taken by his followers to be so profound and abstruse that no mortal could ever reach the depth of its greatness in his lifetime. Since the Book of Changes was considered by Oriental philosophers to be the absolute text book of all the basic principles of the universe, this idea of Yi was the biggest obstacle that stood in the way of scientific evolution of Oriental thoughts.

Since the Oriental philosophy of science was based on no unique definition, little a posteriori reasoning was found in its system. Neither a priori argument could be found from the list of various phenomena in the process of understanding the principles of nature. A knowledge that had neither inductive nor deductive reasoning in its methodology was not a science in modern sense. About an individual phenomenon, only the interpretation that was multivocal was possible in its definition and formalism. The words of highest authority, namely the



teachings of Confucius were consequently received as the absolute truth and remained unchallenged and unsurpassed.

Here, the Oriental knowledge failed to be a univocal knowledge for all people, but degenerated to be a knowledge for one to gain his fame and reputation as a scholar. This in turn hindered people from supporting the real truth and cultivating a new knowledge. On the contrary, people gathered under the authority of a particular politico-scholar to safeguard their seats of learning. Always the teachings of Confucius were held in reverence even to be worshipped as the religion of Confucianism, and along with it, the naturalistic idea of Lao-tzu's Tao was regenerated as a religion of the hermit, namely Taoism.

#### Philosophy of Mo-tzu and its Science

Of many thoughts developed in the ancient Oriental society, the philosophy of Mo-tzu showed a unique peculiarity. His ideas were succeeded by his followers for only about 200 years, but then suffered persecution for 2000 years. Now that the modern scientific culture of the West is introduced, Mo-tzu's philosophy is looked upon with a new insight into it. The main reason for its rejection ~~was~~<sup>lay</sup> in its ideological novelty of diligence and economy based on universal love and pacifism, which inevitably stood on the negative side of the politico-Confucianistic ideas of disciplinary system that emphasized loyalty and filial piety and that upheld the virtues of benevolence, righteousness, propriety and wisdom. The following are the main thoughts of Mo-tzu's philosophy.

His philosophy of pacifism invited to love others as myself, others' parents and other nations as mine.

Mo-tzu contended that propriety should be practised accordingly at convenience. In contrast to Confucius' assertion that a funeral should be performed generously, Mo-tzu maintained that it should be held as simply as possible lest it should impede occupational activity.

In addition, Mo-tzu believed in no fatalistic destiny and rejected the Confucianistic effeminacy of submission to destiny. Instead, he advanced the idea that a man could carve out his fortune through his will, and this will was not the will of heaven. Mo-tzu, unlike Confucius, believed in the Supreme Being.

Mo-tzu was thoroughly a pacifist and renounced wars as he held human life in high esteem. During the course of his study of scientific technology, he never engaged in developing offensive weapons. Instead he worked on defensive strategies and weapons only to safeguard against any possible foreign invasion. He maintained it a grave crime against human race for a state ruler to provoke a war at a great sacrifice of human lives.

While Confucius valued pleasure, Mo-tzu considered it an extravagance and something to abstain from.

Whereas all the Oriental philosophy was devoid of experimentalism and sought after transcendental idealism, Mo-tzu emphasized knowledge through experience and its practical application based on positive empiricism.

Strong utilitarianism dwelled in Mo-tzu's thoughts. His idea of "the most out of the good and the least out of the bad" is akin to Bentham's idea of "the greatest happiness for the greatest majority."

Mo-tzu was different from other Oriental philosophers in that his ideas were thoroughly empirical and his descriptions clearly definitive in explaining nature. They were completely in accord with the modern scientific method. Listed below are a few of his scientific ideas.

Arithmetic: 1 was less than 2 but greater than 5. Here he reasoned that 0 was also 1, based on the decimal system.

Geometry: Flat meant equal heights, and center meant equal lengths. Circle was that which measured equal length from a center, and square was that which had four pillars.

Optics: The difference in the size of a shadow resulted from the difference

in angle and distance. There were two shadows, one being the true shadow and the other being the half shadow.

Mechanics: Force was what caused substance to move. Force was the weight of substance and motion was the displacement of its position.

Mo-tzu's idea of time and space was a very interesting one. Time was that which extended over different moments and space was that which extended over different places. This idea of time and space was later supplemented by Chun-nan-tzu ( 淮南子 , B.C. 179-123) in his description of universe or Yu-chou ( 宇宙 ). By ascribing space to Yu ( 宇 ) and time to Chou ( 宙 ), he recognized universe as space-time continuum. This concept was almost in accord with the modern theory of space-time continuum.

#### Rediscovery of Oriental Philosophy

8 So far, I have introduced the essence of the philosophy of Confucius and Lao-tzu that formed the mainstream of the Oriental culture, as well as the philosophy of Mo-tzu that suffered estrangement over the past twenty centuries.

People who give serious thought to today's world crisis may very well wonder if there ever is a highest good that can lead us to tide over the crisis, and if so, what that is. People all over the world have seen countless times throughout the past history what was good for one was bad for someone else. To be an universal good for all peoples, it must be the highest good not only for one individual or group but also for another individual or group. The discovery and realization of such highest good is what we need now in solving today's problems. I have here tried to find this highest good in Oriental philosophies of Confucius, Lao-tzu and Mo-tzu.

Mo-tzu advocated philanthropism and pacifism and hence permanent peace based upon universal love. People of his group adopted diligence and thrift as their creed and lived like prisoners of those days. Since prisoners had

their faces tattooed with black ink or Mo ( 墨 ), his followers were called "Men of black tattoo."

The resources of today's world are rapidly giving out, as warned by men of the Iron Club. A Japanese on the average is consuming a ton of iron each year, and this amount is more than the amount of food he takes for a year to sustain his life, or more than the amount of iron consumed by a hundred men of some underdeveloped countries in Asia or Africa. America today is spending petroleum at a rate that will exhaust within a hundred years the entire petroleum resources of the earth.

People nowadays consider consumption to be a virtue and a barometer for social development. However, looked upon from the point of the welfare of humanity, big consumption without economy certainly must be corrected at once. There was obviously no exception in the days of Mo-tzu that there were wealthy people as well as poor people. Confucius stressed on a grand funeral ceremony in the name of propriety, but Mo-tzu considered it a social evil and pleaded for a simple funeral.

It may not be true that the way of Mo-tzu's philanthropism, pacifism and frugality is the only way to deal with today's world problems, but surely found in his ideas are the requisite elements for solving those problems.

Seen from humanistic view points, it may be difficult to accept Lao-tzu's idea that human beings are considered one equal entity of nature as animals and plants, but on second thoughts, we should certainly re-appraise our consciousness that man is the lord of all creation. We should gravely reflect upon his "lordy" idea that has led us to the world-wide problems of explosive increase in population, extravagant consumption of resources, successive extermination of wild species, and irreparable destruction of natural environment. At a glance, it seems an advantageous idea that man should conquer and control nature and that nature is subordinate to man, but it is actually a very tragic and dangerous idea. For both man and nature to survive on earth, I believe, we

should look into the naturalistic idea of Lao-tzu, who did not think of the ways of man and nature in separate terms.

At this point, I wish to recall the famous line in Confucius teachings, "---ability to rule ~~over the~~ world comes after good statesmanship of his own country; successful statesmanship comes after good home management of his own household; home management comes after moral training of himself; moral training comes after honest mind; honesty comes after sincerity; sincerity comes after ~~conversance with nature.~~" In other words, harmony with natural laws is interlinked with the welfare of mankind.

Scientific technology without regard for the laws of man and nature is no better than the traditional Oriental philosophy of politico-Confucianism that had unfortunately crippled itself by disregarding the empirical aspect of Mu-tzu's philosophy. If there ever exist the highest good applicable to individuals and groups as well as races of the whole world, it is the universal love based on the great law of god-given universe, which is none other than the harmonious relationship of man to man and man to nature.

