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**Comparisons and syntheses of Eastern and Western
biophilosophical theories**

Cai, Nelson Y., Ph.D.

City University of New York, 1993

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**COMPARISONS AND SYNTHESES OF EASTERN AND
WESTERN
BIOPHILOSOPHICAL THEORIES**

by

NELSON Y. CAI

A dissertation submitted to the Graduate Faculty in Biology in Partial
fulfillment of the requirements for the degree of Doctor of Philosophy, The
City University of New York

1993

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Abstract

COMPARISONS AND SYNTHESSES OF EASTERN AND WESTERN BIOPHILOSOPHICAL THEORIES

by

Nelson Y. Cai

Adviser: Professor Stanley N. Salthe

There are three major purposes of this study. The first is to introduce some basic Eastern biophilosophical theories to Western scientists and philosopher. These are mainly Buddhist ones, which are here dealt with as biophilosophical theories, “metabiology”, or “universal biology” rather than religion. The second purpose is to make comparisons between biophilosophical theories of the East and the West, while the third is to attempt by synthesis to begin developing some new approaches and hypotheses to complement both of these approaches.

It is considered that the central concepts of Buddhism are descriptions of the nature, development, inheritance, and evolution of life as well as discussions of how to self-regulate, self-control, and self-improve our lives.

There are some differences and also some similarities between the biophilosophical theories of the East and the West. It is thought that the basic difference between the two is the point of emphasis. Ontologically, it may be said that there are views of both the noumenon or

absolute and the phenomenon or relativity of the universe and life in the West as well as in the East. Eastern views emphasize more the noumenon / absolute, while Western theories are more concerned with the phenomenon / relativity. In the West, we find the abstract concepts of Plato's *eidos*, Aristotle's *dynamis*, and Kant's *thing-in-itself*, compared to the concepts of the absolute in the Taoist *Wu-Wei* and *Wu-Ji*, Confucian *Reason* and *Chi*, and Buddhist *bhutatathata* and *nirvana*. Epistemologically, it may be said that there are analytical views of both subjective mind and objective material in the East as well as the West. The holistic view and inner, mental or regressive observation are emphasized in the East, while the analytic view and outer, physical or deductive natural observation are emphasized in the West.

Lacking the concept of the absolute, holistic, and unified noumenon, the problem of mind-body / mind-material, and / or the problems of Vitalism, Organicism, and Mechanism or Reductionism, arise in Western biophilosophical theories since Aristotle and Democritus to the present time. In the East, these problems cannot arise because their theories unify the subjective mind and the objective material or physical world as two aspects of the noumenon / *bhutatathata* or pure-mind / true-life.

On the basis of comparisons of the biophilosophical theories of the East and the West, a newly synthesized three-hierarchical definition as well as a new dialectic-unified-energetical-monistic system of life, which I call Bio-Meanism, is herein suggested. Three new hypothetical approaches of life, Bio-Determinism, Neo-Geneticism, and Neo-evolutionism are presented, in which two systems of genes, germlines, genotypes and phenotypes, and two types of inheritance and evolution are involved.

Finally, the value of a hoped-for second Renaissance based on a future development of an integrated Eastern and Western biophilosophical theory is also discussed.

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General Introduction

I. Introduction

There are many different theories in both Eastern and Western worlds concerning the philosophy of life (biological philosophy or biophilosophy). Fushi (4498 B.C.), Laotzu (571 B.C.), Shakyamuni (Buddha, 563-483 B.C.), and Confucius (551-479 B.C.) represent the early progenitors of the East; and Socrates (470-399 B.C.), Plato (428-348 B.C.), and Aristotle (384-322 B.C.) represent that of the West.

According to Aristotle, science begins with wonder. He said: “ It is owing to wonder that people began to philosophize, and wonder remains the beginning of knowledge.” (Gilbert, 1988). The source of wonder throughout Eastern and Western history has been the source of the development of biophilosophy.

What is biophilosophy or biological philosophy ? It deals with various kinds of philosophical problems concerning life phenomena; such as: what is the nature of life, how did life originate on the earth, what information guides the morphogenesis of shapes and forms and the differentiation of the functions of cells, tissues, organs, and body of an organism, what is the nature of the mind, consciousness and of sensation, what are the differences between these, and what are the relationships between body and mind ? Wonder has constantly stimulated people to seek the causes or essence of life phenomena, which is the basis of the production and development of biophilosophy.

Aristotle first established his biophilosophical theory, a vitalistic life theory, in Greece in about 350 B.C., which dealt with stimulation by the wonder of life phenomena (J. Barnes, 1984; Gotthelf, et al., 1987). For the first time in human history, Fushi established, in China,

in about 4,500 B.C. the Yin-Yang (or positive-negative) life theory (Ni, 1990; Sung, 1986; Ying, 1989). Later on, this theory was further developed by others, such as Huangti, Laotzu and Confucius.

Considering his stimulation by the wonder of life and the phenomena of birth, aging, illness and death, Shakyamuni established the Buddhist life theories in India about 530 B.C. From the Buddhist standpoint of view, these theories are not only a system of ideas, but also are considered as rules for living. Shakyamuni not only established his theories by the example of his life, but also he presented many approaches, according to different human situations, to show how his theories would work for others. Furthermore, just before his death or “*nirvana*“, he transmitted a special, direct, efficient, and sudden approach of enlightenment. This was called “ mind to mind “ or Ch'an (Zen), which was later transferred into, preserved and further developed in China.

A useful perspective for this discussion is that Western thought directs consciousness principally outward, and its Eastern counterpart focus more inwardly. Because this outward direction, westerners have studied its external physical world (including animate and inanimate) in greater detail than easterners do. Thus, science developed quickly in the Western world. Because of its inward focus, Eastern thought has studied the inner mental world in more detail. Thus, mental knowledge, or awareness of the mind and its subtle functions, developed deeply and thoroughly in the East. It is seen there as an inherent aspect of reality and may be called mindology (including Buddhism, Confucianism and Taoism).

Therefore, both thoughts in Eastern and Western cultures have a special characteristic. From the viewpoint of biophilosophy, this study will attempt to make some comparisons and integrations between some of them. There are very few previous studies in this field, and some new ideas and approaches will be presented.

In his important publication, *Science and Civilisation in China* , J. Needham dealt with Taoism, Confucianism and Buddhism in the Chinese *History of Scientific Thought* (Vol.2,

1969) and made some preliminary connections between these and Western philosophical as well as scientific thoughts. However, Needham's work mainly focused on summarizing Chinese science and civilization and only in a supplementary fashion introduced some Western ideas, in order to make some comparisons and connections.

In the Western world, biophilosophy was established by Aristotle who first established the theory of Vitalism (Barnes, 1984; Driesch, 1914; Preus, 1975; Singer, 1979; Wheel, 1939). After the development of modern biology and embryology, H. Driesch, a German biophilosopher, developed a theory of neo-Vitalism at the early stage of this century (1914, 1929). Later, H. Bergson, a French philosopher, introduced this idea into social and cultural evolution (1975). J. Needham et al., on the basis of neo-Vitalism and the advances in developmental biology and biochemistry, further developed a theory of Organicism to overcome the dualistic viewpoint of neo-Vitalism and establish a holistic viewpoint of the self-control, self-regulation, and self-organization of life structure (Bertalanffy, 1933, 1952/1960; Haldane, 1931; Haraway, 1976; Harrison, 1969; Needham, 1925, 1926, 1928, 1942; Waddington, 1956). However, these authors did not present a synthesis of the ideas of Western biophilosophy with that of the East. Furthermore, Organicism still has not been able to resolve issues about the true nature of life and the basic mind-body problem.

During the last 30 years, Buddhism, especially Zen Buddhism, has gradually become known to Americans and Europeans (Layman, 1976; Morreale, 1988; Tworkov, 1989). It is not yet, however, widely known by scientists, especially natural scientists. Therefore, it is now important to present Buddhist concepts to both social and natural scientists, with the hope that they will realize its relevance and usefulness to both social and natural sciences.

Since the end of 1950's Zen Buddhism has begun a process of synthesis and integration with Western thought and Western philosophy (Abe, 1985; Ames, 1962; Eckartsberg et al., 1989; Hirsch, 1970; Humphreys, 1987; Kapleau, 1989; Mehta, 1970; Umehara, 1970; Yamaguchi, 1986). A process has also started to compare and connect it to

natural science. Capra (1975) tried to do this in modern physics. Hirai, et al. also did a series of works to connect Zen Buddhism with psychology, psycho-physiology, and psychotherapy (Ajaya, 1985; Berger, 1962; Dai, 1969; Goleman, 1975; Hall, 1979; Hirai, 1960, 1989; Hirai, et al., 1959; Kasamatsu, et al., 1957, 1969; Lesh, 1970; Levin, 1989; Murphy, et al., 1988; Sarathandra, 1958; Silva, 1989; Suzuki, et al., 1970; Valle, et al., 1989).

On the other hand, C.T. Lee et al. (1988, 1990, 1991), one of the earlier scientific researchers of Chi or Qi (which means inner or subtle energy) in the psychological field, used scientific methods and self-practice to demonstrate the existence of chi and made connection with "subtle energies and energy medicine". Under his strong influence, he and his American colleagues have organized an international organization, the International Society for the Study of Subtle Energies and Energy Medicine, in Colorado. It has rapidly developed both medical applications and theoretical research. Sattler (1986), in his *Biophilosophy* , also connected the Chinese idea of Chi with the Western idea of vital-energy. Although his comment was very brief, it was the beginning of a revival of the view of the vital-force in recent publications.

There is very little which has been done to connect Buddhism with biology and biophilosophy. To this writer's knowledge, what has been discussed in Buddhism belongs mainly to biological / biophilosophical problems. Therefore, the present study deals mainly with connections between some Western biophilosophical theories and some major Buddhist theories. It is hope that this will be a creative and significant work, with practical meanings for human health, longevity as well as the liberation of life. There are basically three purposes of this study:

1. Introduction of some basic Eastern biophilosophical theories, mainly Buddhist ones, to modern Western scientists and philosophers;
2. A comparison of Eastern and Western biophilosophical theories;
3. An attempt to integrate, synthesize, and complement their main concepts and to develop a dialectic, unified, bioenergetic and monistic system of life, the Bio-Meanism.

II. Objectives and Significance of This Study

1. Comparison of Eastern and Western Biophilosophical Theories

The first purpose of this study is to compare Eastern and Western biophilosophical theories. A brief outline of the basic theories of both Eastern and Western biophilosophies is given separately as follows.

1.1 Basic Theories of Eastern Biophilosophy

In the Eastern world, the earliest biophilosophical theory was developed by Fushi (4498 B.C.). In his well-known book, the *I-Ching* or the *Book of Changes* , he first used dialectical method to divide the truth of the universe and life into two: (1) Tai-Ji, equivalent to absolute-truth, and (2) Yin-Yang or Di-bearing as well as their derivatives, Tetra-appearance and Octa-trigram, equivalent to relative-truth. Fushi claimed that Tai-Ji is a root from it producing Yin-Yang (Di-bearing), Tetra-appearance, Octa-trigram, and all universal things and life (Sung, 1986; Ni, 1990; Ying, 1990). Therefore, Tai-Ji is equivalent to noumenon and Yin-Yang as well as their derivatives are equivalent to phenomena. This is Fushi's Tai-Ji and Yin-Yang theory.

From Fushi's theory, two somewhat different biophilosophical theories were subsequently differentiated, i.e. Taoism and Confucianism. Their common biophilosophical ideas are Tao and Chi (Qi). However, the former is more related to the natural and biophilosophical, and the latter is more related to the educational and sociological.

It is interesting to note that, in the Eastern world during the time between the 6th and 5th centuries B.C., Taoism and Confucianism were raised in China and Buddhism was raised

in India; and that the basic ideas of Buddhism are similar to Chinese theories, especially Taoism. However, Buddhist concepts are more concrete and have an emphasis on biology and biophilosophy.

There are ten basic common ideas shared by these three Eastern biophilosophical theories. (1) The universe and all living-beings can be radically divided into two sides: the noumenon and the phenomenon. (2) All living-things with their particular living-worlds share the same noumenon. (3) All living-beings, including humans and animals on this earth, possess an enlightening self-nature and they are all equal. (4) Some of them are in an enlightened condition, but a majority of them, including human-beings and animals, are in delusive situations. (5) All living-beings potentially possess omnipotence or totipotentiality. (6) Due to delusion, human-beings, also animals, lose this ability in different degrees according to the different degrees of delusion. (7) The situation of losing totipotentiality is reversible. (8) The ability of the functions of life needs firstly to be developed and enlarged, and then the totipotentiality of life needs to be recovered or achieves through enlightenment. (9) There are many different methods by which to enlarge the ability of the functions of life and to recover the totipotentiality of life. (10) The nature or noumenon of life or noumo-life is actually a totipotential force without a cycle of birth or death and is eternal / absolute; and the phenomenon of life or the pheno-life of living-beings, who are in delusion, is an energetic continuum with periodical birth and death. In this idea, the existence of enlightened living-beings is also apart from birth and death, and is a special type of transformation apart from the cycle of birth and death.

Therefore, in the Eastern world, although there were three different biophilosophical theories with two different origins, two in China and one in India, their basic concepts were basically the same and only their methods of application and emphasis were different. The detailed descriptions of their concepts (mainly Buddhist) will be presented in Part I.

1.2 Basic Theories of Western Biophilosophy

In contrast to Eastern thought, in the Western world, there was no original relatively unified biophilosophical theory to compare with the *Tai-Ji and Yin-Yang theory* of Fushi. In ancient Greece, there were only two opposite biophilosophical theories: Vitalism as represented by Aristotle (384-322) and Mechanism as represented by Democritus (460?-360?). Due to the strong influence of Aristotle in biology / biophilosophy, Vitalism was a dominant biophilosophical theory until the appearance of the Darwin's theory of evolution or Darwinism in 1859.

Since the birth of Newtonian dynamics in physics, Mechanism had a great influence in natural philosophy / biophilosophy and gradually became dominant over Vitalism. After the birth of Darwinism and due to its great influence as well as its mechanistic nature, the influence of Mechanism over biology / biophilosophy almost attained the maximum.

From the end of the 19th century to the first one-third of 20th century, due to the development of experimental embryology, a neo-Vitalism was raised by Driesch, a German experimental embryologist and biophilosopher. However, after 1930's, it was substituted by another biophilosophical theory, Organicism, established by some American, English and German experimental embryologists.

Not long after its development, due to the rapid development of the molecular theory of genetics, biology and evolution, Organicism was succeeded by a third type of biophilosophical theory, Reductionism. Its basic nature is actually mechanistic, and so it may be called a neo-Mechanism. This is the dominant theory today in the field of Western biophilosophy. The detailed discussion of Western biophilosophical theories will be mentioned in Part II.

2. Synthesis and Complement of Eastern and Western Life Theories

The second purpose of this study is an attempt to complement and integrate some Eastern and Western biophilosophical ideas. Let us first look at the fact that how three Eastern biophilosophical theories were complemented and integrated in ancient China.

After about six centuries of its establishment in India, Buddhism was introduced into China in 67 of the 1st century (Jiang, 1989, p.1). It developed for several centuries there and began to integrate with one of the major original Chinese biophilosophies, Taoism. According to Needham (1969), the interesting reason, why Indian Buddhism first integrated with Taoism, is because there were many similarities between the two.

As the resultant of this integration, from the Chin, Sui to the Tang dynasty (4-10th centuries), a series of Chinese Buddhist schools, such as the Three Sastra school, the T'ien-T'ai school, the Hwau-Yen school, and the Zen school, were established. After this, Buddhism continued to develop, and next integrated with another major Chinese biophilosophical theory, Confucianism. Two new schools of thought emerged from this: the Chinese Rationalism of Chu Hsi during the Sung dynasty (10-13th centuries) and the Mindology of Yangming during the Ming dynasty (14-17th centuries). After this synthesis, Chinese philosophy / biophilosophy attained a stronger state, and thus the three Eastern biophilosophical theories began to be integrated.

Needham (1969, p.291) gave Chu Hsi's Chinese-Rationalism high praise. He said:

I shall seek to show that the greatest of all Chinese thinkers, Chu Hsi in the + 12th century, developed a philosophy more akin to the philosophy of organism than to anything else in European thought. Behind him he had the full background of Chinese correlative coordinative thinking, and ahead of him he had -- Gottfried Wilhelm Leibniz.

Needham's view is very enlightening. Due to the development of modern communication methods, world consciousness / global mind is changing and beginning a process of moving toward a whole (Harman, 1990). From the viewpoint of developing world civilization, Eastern biophilosophical theories has already started a process of mutual interaction with Western biophilosophical theories. It is possible that once the former and the latter merge, just as the three Eastern theories did in China, a new biophilosophical theory will emerge in the Western world --- with a good chance that it will emerge in North America.

It is further possible that once a new biophilosophical theory has emerged, then biological sciences and other physical sciences will also have revolutionary developments and make great progress. The viewpoint of present work agrees with that of C.T. Lee and E. Green that we are in the midst of the third revolution in science (Lee & Schneider, 1990). Let us consider again what Needham (1969, p. 291-292) has said:

Here it is not possible to do more than mention the great movement of our time towards a rectification of the mechanical Newtonian universe by a better understanding of the meaning of natural organisation. Philosophically the greatest representative of this trend is undoubtedly Whitehead, ... But is that not perhaps in part because Leibniz had studied the doctrines of the Neo-Confucian school of Chu Hsi, as they were transmitted to him through the Jesuit translations and despatches ? And would it not be worth examining whether something of that originality which enabled him to make contributions radically new to European thought was Chinese in inspiration ? If we may propose then as a hypothesis for further research that the philosophy of organism owes a great deal to Leibniz, and that his mind was stimulated by the Neo-Confucian version of Chinese corelativism, several further points of interest follow.

Extending from this idea, could it not then be said that a great movement of our time will be based on a rectification or reconciliation of the mechanical Darwinian animate universe with the better understanding of the meaning of a dialectical-unified-monistic wholeness field system of life (which is the synthesis of East and West biophilosophical theories and will be explained latter) ?

Here are a few brief comments on how to do this and on what kind of basis. In the Eastern world, the merging of Taoism, Confucianism and Buddhism in a new Confucianism, i.e. the Chinese-Rationalism of Chu Hsi and the Mindology of Yangming, was based on the common element of these theories, the transcendental idea of “Tao.” When this concept emerged, there was a merging of the consciousness of different civilizations in almost half of the world(the East). Next, based on this merging in the East, there will be a new merging of the consciousness of the East with that of the West. This study sees it as inevitable. Thus, it leads to the questions: What is the real meaning of “Tao,” can Western consciousness also be merged with “Tao,” and what is the connection with biophilosophy ?

From the viewpoint of a biologist and biophilosopher, the author would like to offer the following: Firstly, Tao is a way, a way to the truth; secondly, Tao is truth and there are two levels of truth --- the relative and the absolute. But Tao places more emphases on absolute-truth, for it is the root of relative-truth --- the former generates the latter, as said in the *Tao Teh Ching* (Lao Tzu, tr. J.C.H. Wu, 1989):

As the origins of heaven-and-earth, it is nameless;
As “the mother” of all things, is nameable (p.3).

All things under heaven are born of the corporeal;
The corporeal is born of the Incorporeal (p.83).

Tao gave birth to One,
One gave birth to Two,
Two gave birth to Three,
Three gave birth to all the myriad things (p.87).

Here, the “nameless”, “Incorporeal”, and “Tao” all mean absolute-truth. It is not only a “reason”, but an “entity”. However, this kind of entity is transcendental; it has to be realized by means apart from one’s consciousness and by the awakening of one’s true wisdom (*prajna*) of one’s true mind. This entity is also the real origin of the life-force / life- energy, which is the central idea of this study and will be discussed in detail later.

Western consciousness and philosophy owe much to the theories of Socrates, as presented by Plato and Aristotle. Because this study emphasizes biophilosophical theories, it is closely related to the theory of Aristotle. Therefore, it is useful to compare and tries to integrate the ideas of Tao with some basic ideas of Aristotle represented as the Western idea of truth.

There are several basic ideas of Aristotle, which relate to biophilosophy, such as *ousia*, *dynamis* (potentiality), *entelecheia* (actuality), *energeia*, *psyche*, soul, form, essence, unmoved mover, and ether. Now, one has to ask how these ideas of Aristotle coincide with the meaning of Tao ? It may be said that the answer is half --- the relative half of Tao. These ideas merely belong to an abstract level and not yet to an absolute level, thus they still belong to the relative-truth level of Tao.

Therefore, Aristotle did not consider ideas equivalent to the absolute noumenon or absolute-truth level of Tao, and only considered about the abstract level of relative-truths. Aristotle also did not mention any appropriate approaches / methods to identify and reach them, because an abstract area can never be identified and touched. Thus, it may be said that in Western biophilosophical field there is no notion of the absolute but only an idea of the abstract. Aristotle did not finally enter into the ultimate area --- the absolute-truth domain. However, under the influence by Aristotle, and later by Newton and Darwin, Western ideas were developed more experimentally and in much more details and analyses than Eastern ones.

In conclusion, the complement and integration of Eastern and Western concepts in biophilosophy may be met by the heightening and connecting Aristotle's ideas with the Eastern idea of Tao, which grew from the merging of Taoism, Confucianism and Buddhism in China. As stated earlier, it may be said that because Western consciousness inclines towards external phenomena, this has led to more discoveries in relative-truth and scientific development. Because Eastern consciousness inclines more towards understanding inner wisdom, this has led to the discovery of the absolute-truth of Tao. Therefore, there has been less scientific

development in China, although many important scientific discoveries occurred in ancient times. The focus on relative-truth leads to the development of the material world, in which humans enjoy a rich material life. The focus on absolute-truth leads to the development of the spiritual domain, in which humans enjoy a rich inner life. More importantly, it leads to the liberation from the pain of inner consciousness and rebirth to reach one's realm of *nirvana*.

However, if development is based solely on either relative-truth or absolute-truth, this is an incomplete and unsatisfactory condition for human life and society. Therefore, it is beneficial to complement and integrate Eastern consciousness and its notion of absolute-truth with Western consciousness and its ideas of relative-truth toward developing a unifying biophilosophical theory and a complete set of truth / Tao. Although Eastern consciousness actually includes both truths --- this is the reason why many important scientific discoveries also appeared in ancient China, the relative-truth is currently much undeveloped and unsatisfied.

3. Development of a Dialectical Bioenergetic Unified Biomeanism

The third purpose of this study is to develop a bioenergetic, dialectic, and unified Biomeanism: a monistic system of life. This is the inevitable result of the complement and integration of Eastern and Western biophilosophical theories. However, we are now only at the starting point of this work.

In the field of Western biophilosophy, there are several very basic and important issues, such as the ideas of entelechy, vital-force, unmoved mover, and ether (mentioned above), which have not been actually solved since Aristotle's time and finally lead to the decision to abandon them. Due to this situation, Western biophilosophy gradually became more and more mechanical and materialistical. Life material has been analyzed deeper and

deeper, smaller and smaller, in more and greater detail, from body to organs, tissues, cells, organelles, chromosomes, chromonemata, and now further down to DNA molecular levels and subDNA levels --- the DNA segments of genes and genetic codes, even more to isolate and transfer genes. Life has been separated into segments, fragments and molecules by modern biologists, biochemists, biophysicists and reductionists. However, what is true life ? May be no one can tell us as a whole. Actually, no notion of true life exists. Life is only seen as a skeleton and the function of material.

What is true life, and how to identify it ? Answers have been given in the Eastern world as early as 2, 500 years ago. Due to the obstacle of languages as well as terminological and communication problems in the past, biologists and biophilosophers in the Western world do not know the Eastern answers, and they have not tried to practice and identify them. Therefore, the author feels his background enable him to assume responsibility to try to build a bridge between Eastern and Western biophilosophies.

This study is preliminary such kind of a bridge, and the beginning of a basis for a new energetic information approach / a dialectic-unified-monistic field system of life. Its meaning will be explained briefly in the next section.

III. A Dialectical Bioenergetic Unified Biomeanism

In order to synthesize and complement Eastern and Western biophilosophical theories, it is necessary to develop a new theory as mentioned before. What its contents will be described in detail in Part III. Here, some of its basic ideas will be shown, so that one can get a brief overview of this theory.

1. A Dialectical Bioenergetic Information Approach of Life

In this study, the central ideas of life are life-force and life-energy. They exist on / in two different levels or domains. Life-force is more basic than life-energy and exists on / in absolute-truth level / domain. It functions as a potentiality and this potentiality is a “totipotentiality”, which possesses tremendous power that is called “totality”. Its Eastern term is called “Lingxing” or “Jiaoxing” (means the total ability of sensations, perceptions and thinking).

Life-energy further includes another component, bio-energy. Life-energy functions as mind / consciousness / sensation or mental system, and bio-energy functions as other than consciousness system in the body. Both life-energy and bio-energy belong to relative-truth level and functions as an actuality (corresponding to Aristotle's "first actuality"). Life-energy is transformed from life-force and is its expression.

Bio-energy separates from life-energy and its basic form is called Chi (or Qi) in China. There are no life-force and life-energy or Lingxing / Jiaoxing in plants, which only possess bio-energy or Chi (somewhat like Aristotle's “plant soul” or “vegetative soul”). With the aid of plant bio-energy acting within chloroplasts, sun light energy can be fixed in photosynthesis to produce a kind of biochemical molecule ATP (adenosine triphosphate), which can be

thought of as a secondary or physical form of bio-energy.

According to modern biology and biochemistry, ATP is a higher energetic molecule in which a great deal of energy is stored. By eating plants, animals and human beings can then indirectly obtain sun light energy from plants and thus can be alive. This is the energy-dynamic origin of the organic world. Therefore, if there were today no photosynthetic product ATP, there would be no animals and human beings.

However, according to Buddhism, this phenomenon is true but this idea about it is incorrect. The correct one is that the ATP molecule, or more exactly to say high-energy bond, is only a necessary condition for activating the primary bio-energy or Chi already existing in the physical body of animal or human beings. The energy of sun light, or more exactly, the photon, is only the necessary condition for activation of the plant bio-energy or plant Chi, to operate photosynthesis and synthesize ATP molecules.

Therefore, in the Eastern idea, human beings, animals and plants are actually linked together by Chi or bio-energy, which is also linked together with “ universal-energy “, such as the sun energy. Thus, on the basis of energy, living things and the universe are actually a whole. Furthermore, universal-energy is also transformed from life-energy, or more radically transformed from life-force. Thus, one may also consider that the Newtonian universal-gravitation / gravitation-field is also expressed by life-force.

The next step is to consider why and how life-energy transform both bio-energy and universal-energy ? The answer lies in perceiving that traditional ideas about the Newtonian and even Einsteinian evolution of the universe as well as the Darwinian and neo-Darwinian evolution of the organic world are somewhat incorrect or incomplete. According to Eastern thought, as exemplified in Buddhism, the evolution of both the universe and life has to be considered as a whole. If one considers them separately, one is led to incorrect or incomplete conclusions. It is most important to establish a new and central concept that life is the center of the universe and the universe belongs to life, but not life belongs to the universe. The Eastern

definition of life is much broader than that of Western one. True life exists in the whole universe. There is no dimension: no space, no time and also no direction. It is actually equivalent to true mind which is really a totipotential force.

Life-force transforms into life-energy by the activity of consciousness within the physical world. Life-energy further transforms into bio-energy, and life-force through both of life-energy and bio-energy makes the physical body (not then enters into it as the Aristotelian concept of soul does). In this view, the ideas of life-force, life-energy and bio-energy differ from the ideas of Aristotle's or Descartes' soul, or of Driesch's vital-force. Life-force and the other two types of energies are the real masters of their physical body, which is like a house to be built up by their own "hands". This concept is neither like that of Aristotle's and Descartes' soul, nor like that of Driesch's vital-force, which are all only like tenants or lodgers moving into and living in landlord's or landlady's house.

During the processes of conscious / sensational and physiological activities, life-energy and bio-energy also transform into universal-energy. Universal-energy through plant photosynthesis transfers into and transforms physical body. This is a universal circulation. In this circulation, it is very clear that life-energy / bio-energy and universal-energy totally link together. This circulation is also based on a universal developmental hierarchy of life-energy / bio-energy. Therefore, this theory, in one sense, is a further development of Salthe's *Specification Hierarchy Theory* (Salthe, 1985, 1988, 1989), which is considered in more detail later.

From the viewpoint of Eastern concepts of mental status, there exist two types of humans: the enlightened and the unenlightened. Most of us generally exist in the unenlightened status. In this status, the life-force / life-energy or the true mind force is covered or hidden, and is expressed in the form of a stream of expanded consciousness (Taylor, 1978). Thus, an unenlightened person's life divides into two energy-streams: the stream of Chi (called Yin) and the stream of consciousness (called Yang). According to the theory and method of

this study, attaining enlightenment is based on unifying these two streams of energy together. It takes two steps: the first is to unite two into one, that is, to unite Yin and Yang into Tai-Ji or the 8th consciousness level, i.e. life-energy or the root of relative-truth domain. The second is to transcend oneself into emptiness, that is, Wu-Ji or true-mind, i.e. life-force or absolute-truth domain.

It is likely that Western scientists and philosophers will neither quickly nor easily accept this idea. But the author believes if they can consider it precisely and openly, and practice it carefully and continuously, according to a precise method, they will realize its truth and merit and will be able to function within an enlightened absolute-truth world. Only after being enlightened and entering into the absolute-truth world, can scientists and philosophers truly and deeply realize the relative-truth world, and also understand both the world and life realistically, exactly and completely.

Unfortunately, it is a secret to an individual that before enlightenment one can only realize an imprecise, delusive or false world and false life (the meaning of “false” is based on the concepts of phenomenon, relativeness, changing, and to be a combination of conditions). This is because, before enlightenment, one cannot understand things, both mental and physical or inside and outside of the body, if one leaves one’s consciousnesses. However, the ability of the consciousness of an unenlightened person is limited, and they always band by their ego or subjective state to create illusions. Thus, they cannot realize or keep a true sense of reality or nature. Therefore, if one hopes to truly comprehend the reality and the true objective nature of the universe and life, one has to achieve enlightenment and transform one’s erroneous consciousnesses into pure objective wisdoms (there are four kinds of these wisdoms and will be mentioned later). Only by these wisdoms, one can then truly realize the pure objective reality / true nature of the universe and life.

This may be said to be the great superscientific discovery of Eastern biophilosophy. Although this understanding has been achieved by Eastern biophilosophy, it has not yet been

perceived by Western biophilosophy. So, Western biophilosophy has to complement and integrate with this radical scientific discovery from Eastern biophilosophy.

2. A Dialectical-Unified-Monistic Field System of Life

In the last several decades, some biologists, biophysicists and biopsycologists (Kilner, 1965; Pierrakos, 1975 a & 1975 b; Becker, et. al, 1987) have discovered that animal and human bodies are actually energy systems as well as energy fields. According to the author's point of view, because Tao belongs to the absolute-truth domain, it is actually equivalent to life-force. Needham (1969, p.293) has also dealt with Tao as a "field of force". Please look at what he said:

In a way, the whole idea of the Tao was the idea of a field of force. All things oriented themselves according to it, without having to be instructed to do so, and without the application of mechanical compulsion. The same idea springs to the mind, as will shortly be seen, in connection with the hexagrams of the I Ching, Yang and Yin, Chhien and Khun, acting as the positive and negative poles respectively of a cosmic field of force. Is it so surprising, therefore, that it should have been in China that men stumbled upon what was in very deed the field of force of their own planet ?

In an early paper, the author also raised an idea concerning the field of sensation and mind (Cai, 1988). It will be mentioned further in Part III.

It is worthy to note that important discoveries have recently arisen within the leading-edges of physical science. Physicists, such as, B.D. Josephson (the inventor of Josephson's device for superconductivity), D. Bohm, Prof. of theoretical physics at London University, and F. Capra, Prof. of elementary particle physics at UC Berkeley, have begun to believe and discuss precisely the fact that there exists a domain which lies "beyond science". Therefore, researches, today, are continuing from various perspectives which may be said to be under the

theme of science and spirit. Bohm has called the world, which we experience daily, as the "explicate order", and the invisible world as the "implicate order" (Takasshima, 1988).

Biologists should also assume a leading position in the exploration of the nature of true life. However, modern biologists generally go after the modern physicists and chemists, and follow rather than lead in this research. Thus, biology always becomes, in this respect, a postscript to physics and chemistry.

Part I Eastern Biophilosophy

-- Several Major Buddhist Theories

Introduction to Part I

Before the descriptions of this work, some major Eastern and Western biophilosophical theories, the philosophical theories of life, need firstly to make some reviews and comparisons.

There are a number of discourses on biology in the Eastern world, but they did not developed as extensively as did in the West during the last several hundred years. However, biophilosophical theories in the East were developed relatively broadly and deeply. It is clear that emphases in the different worlds are reflected differently. Eastern work is more emphasized the ontology, absolute noumenon, of life; while Western work is more emphasized phenomenology, relative phenomenon, of life.

As to epistemology, it may be said that this is emphasized in both worlds, but also with some essential differences. In the East, because of an emphasis on ontology, epistemological approaches incline regression towards a consideration of one's inner world, observing and illuminating one's own mind and unifying one's mind with nature together. In the West, because of an emphasis on phenomenology, epistemological approaches more towards the external world to observe and describe nature and life phenomena.

Due to these different perspectives, while both stress the word "nature", their concepts are significantly different. The Eastern concept of nature emphasizes its ontological view. The goal is to decrease one's desire and eliminate one's self-concern as much as possible, and to lead one's mind, which is seen as false-mind due to its contamination and losing its original natural status, back to a restored original one, thereby unifying the noumenon of life and the

nature / universe. The Western concept of nature emphasizes a phenomenological view, in which the relative phenomenological world, i.e. the sum of the sun, the moon, stars, rivers, mountains, springs, water falls, soil, stones, animals, plants, seasons, air, and space, possesses no concept of noumenon.

Because of these conceptual differences between Eastern and Western biophilosophical theories, their developmental directions and results differ greatly. In this light, the present work first makes some comparisons between them, and then attempts, in some aspects, to make some complementation and integration between them, leading to the creation of a relatively complete modern biophilosophical theory, complementary, valuable and useful to both Eastern and Western people.

There are the facts that the oriental originated three biophilosophical theories, i.e. Taoism, Buddhism, and Confucianism, exist their inner connections of their basic notions; and that Buddhism, since introducing into China, has been gradually integrated some essential concepts of the two Chinese originated biophilosophical theories, Taoism and Confucianism. Furthermore, the discussion of biophilosophical problems, in Buddhism, are more broadly, deeply, and systematically. Because of these, in this study, Eastern biophilosophical theories are mainly represented by those major Buddhist theories.

Concerning the nature of Buddhism, some Buddhist scholars, such as Ouyang, claimed that Buddhism is neither a religion nor a philosophy. Some claimed that Buddhism is philosophy, such as Chang (1978), Nian-Sheng (1978), Suzuki (1978), Tze-Tao (1978), and Xian-Wu (1978). Others hold that Buddhism is science, such as Ben-Zhu (1978), Chen (1978), Huang (1978), Lee (1978), Mogang (1978), Wang (1978), and Wang (1990a, 1990b). However, Tai-xu claimed that Buddhism not only is a philosophy because of its application of theoretical reasoning methods, but also is not a philosophy because of its emphasis on verification (Tai-Xu, 1978, p.145-153).

The viewpoint of this study is inclined towards that of Tai-Xu, and further claims that Buddhism is not only a philosophy but also a science. Thus, it may be more exact to say that Buddhism is a “superscience” or “metascience” due to its emphases on both theoretical / transcendental reasoning and practical verification.

It is thought that one thing has an essential importance to be needed to emphasize here. Buddhism claims that there is a life force, namely, *bhutatathata*, pure-mind or self-nature, which is conserved and not annihilated. In addition, this force has an advantage over the vital force of the Western biophilosophy of Vitalisms, and need not be construed as a special force, a position that has made the many versions of Vitalisms unattractive. The reason for rejecting the special-force view is that its existence is untestable. However, the life force of Buddhism avoids this difficulty, and it is possible to verify its existence through specifiable types of experience, which will be discussed in Chapter 9.

Chapter 1 Theory of the Integration of Cause and Conditions

I. Introduction

It is the emphasis of this study to deal with Buddhism not as a religion but it as a philosophy / biophilosophy, or psychobiology / metabiology. Buddhism considers both the animate and inanimate worlds strictly on the bases of logic, theories, and laws. Buddhism here is not based on belief, but is analytic and scientific, established on rational and practical grounds.

This chapter, *the theory of the integration of cause and condition* is introduced first, because it is one of the most basic and important theories in Buddhism. This theory can be understood in both narrow and broad senses. The former includes just one level of sense, the name of the theory itself, which mainly deals with the relative phenomenal- / pheno-world. The latter however, includes at least four levels of senses i.e. three subtheories and one law. These are: (1) the theory of dichotomous- / twofold-truths, (2) the theory of one-dharma-proof / one *bhutatathata*, (3) the theory of conditioned-arising and its emptiness-nature, and (4) the law of cause and effect .

The narrow sense only describes the relative phenomenal- / pheno-world but does not probe deeply into the noumenal- / noumo-world, and so is incomplete one. The levels of the broad sense describes both of those worlds and so is complete. The broad one is adopted here, and three subtheories and a basic law are described as follows.

II. The Theory of Dichotomous- / Twofold-Truth

1. Definition

The theory of dichotomous- / twofold-truths is a basic theory in Buddhism, and it may be said that this is the theoretical basis of Buddhism. According to this theory, both universal-things and living-beings exist twofoldly / dichotomically, or in other words, in a dialectic or oppositional way. From the viewpoint of truth, it may also be said that two essential truths exist. The first is primary truth, absolute-truth, or the real category of truth, which has the character of absoluteness or emptiness; and the other is secondary truth, relative-truth, or the ordinary category of truth, which has the character of relativity or possessingness.

The former is the body or noumenon of the latter, which is discussed mainly in the *Maha Prajna Paramita Sutra* and the *Maha Prajna Paramita Sastra* by Nagarjuna . The latter is the phenomenal, functioning, expression of, and utilization of the former. It is also discussed in the *Avatamsaka Sutra*, *Sandhinirmocana Sutra*, *Lankavatara Sutra*, *Abhidharma Sutra*, and *Abhidharma Kosa Sastra* by Vasubandhu .

These twofold truths control both universal-things and living-beings. Correspondingly, absolute-truth controls the noumo-world or the realm of vacuity and eternity. Relative-truth, however, controls the pheno-world or the realm of functioning and appearance.

From the viewpoint of Buddhist epistemology, absolute truth itself is transcendental of any expression in words or writing, in any language, or way of thinking by any consciousness. It can only be recognized by direct experience or verification, and any description by talking, writing, or thinking is not accurate. Relative truth, according to Buddhist epistemology, is the relative expression of absolute truth, and so can be described through thinking, talking, writing, or any other type of expression.

2. Classification of Relative-Truths

According to the Buddhist *hetuvidya* logical method, relative-truths can be again divided into two different types: the manifestative-reason (*pratyaksa*) and the comparative (logical) reason (Dignaga, *the Nyayadvaratarka Sastra*; in the *Tripitaka*, No. 1628, Vol. 32, p.1). Furthermore, each of these two types can be further divided into true and false two types (*Sankarasvamin*, the *Nyayapravesa Sastra*; in the *Tripitaka*, No.1630, Vol. 32, p.11). Thus, there are a total of four different types of relative-truths, and they can be diagrammatically shown in Fig. 1.

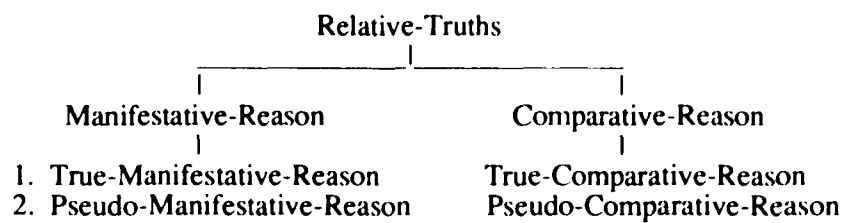


Fig. 1 Different Types of Relative-Truths

The meaning of these four different types of relative-truths are explained as follows (Yu, 1978; in Chang, ed., pp.191-198).

(1) *True-manifestative-reason* (*-pratyaksa*) means that the outside world is directly manifested from the 8th consciousness and realized by the true-wisdom of the true-mind, and that there are no actions of discrimination and recognition of the 6th and 7th consciousnesses, which always discriminate and attach things resulting in their reflections losing the original true faces / situations. In this type of realization, the knowledge / reason or relative-truth obtained truly reflects the “original face” of the outside objective world.

(2) *Pseudo-manifestative-reason (-pratyaksa)* means that although the outside world is directly manifested from the 8th consciousness, but does not realize by the true-wisdom of the true-mind and is discriminated and recognized by the 6th and 7th consciousnesses. In this type of realization, the knowledge obtained does not exactly reflect and has already lost the “original face” of the outside objective world.

(3) *True-Comparative (logical)-Reason* means a comparison of the known and an inference of the unknown. This is also accomplished by the true-wisdom of the true-mind but not by the 6th and 7th discriminating consciousnesses. To accomplish this, one must apply the inference-process of the tri-statement formula (Yu, 1978a, 1978b; in: Chang, ed., pp.1-44, 183-189).

(4) *Pseudo-Comparative (logical)-Reason* means that a comparison of the known and an inference of the unknown are not accomplished by the true-wisdom of the true-mind but by the 6th and 7th consciousnesses of the false mind. Therefore, the knowledge thus obtained is not only indirect, but is also obscure and incorrect.

The absolute-truth or absoluteness and relative-truth or possessingness will be further described in detail in next sections and latter chapters.

III. The Theory of Conditioned-Arising and Its Emptiness-Nature

After thorough enlightenment, Shakyamuni was finally released and obtained great-perfect-mirror-wisdom. This understanding is covered for sentient beings until enlightenment. Then he got the ability to see the whole figure of the pheno-world, the six-ways of transmigration of all kinds of sentient-life. One can not see these before one getting enlightened because they belong to different karma-fields. Shakyamuni, however, was not satisfied to discover these phenomena but also wanted to know the causes of them. After further observation and analysis, he raised another theory.

The *theory of conditioned-arising and its emptiness-nature* is a bridge across between the pheno-world, relative domain, and the noumo-world, absolute domain. It explains and describes how the former arises from the latter, in other words, how the latter transforms into the former. Therefore, this theory is based on and at the same time gives concrete form to the above two theories.

1. Definition

The *theory of conditioned-arising and its Emptiness-Nature* means that all things or relative phenomena, both the mental and the material in the universe, all arise from and are synthesized by the cause(s) and condition(s); and that all of these things or phenomena themselves have no real nature and are rooted in the real absolute domain of emptiness.

In *The Agamas Sutra*, the meaning of cause and effect is explained as : “ Because this is existing, that is existing too; and because this is producing, that is producing too. Because this is non-existing, that is non-existing too; and because this is extincting, that is extincting too.” This means that all kinds of things in the universe do not absolutely exist, but only

relatively exist in a situation of mutual interdependence. There are two kinds of such interdependence: the simultaneous and the non-simultaneous. The simultaneous is such as: “Because this is existing, that is existing too; and because this is non-existing, that is non-existing too.” The word “this” is the subjective, and the word “that” is the dependent. This situation indicates the interdependence of space. The non-simultaneous is such as: “Because this is producing, that is producing too; and because this is extincting, that is extincting too.” The word “this” is cause, and the word “that” is effect. This situation indicates the interdependence of time.

Therefore, from the standpoint of time, the so-called universe is only a continuum of cause and effect. There is always another cause before a cause, but there is no cause for a beginning cause. In the same way, there is always another effect after an effect, but there is no effect for an ending effect. From the standpoint of space, the so-called universe is only a network of subject and dependence. There is always another subject beside a subject, and there is no absolute center. In the same situation, there is always another dependence beside a dependence, and there is no absolute boundary (Yu, 1991, pp.83-84). The same situation applies to life.

Thus, it may be said that both the universe and life are only synonyms of the interdependence of cause, effect and condition. Life and the universe are merely the aggregates (effects) of causes and conditions. When the causes and conditions aggregate and act together, both life and the universe generate or appear. However, such aggregations or appearances are merely illusions, because their existence is merely temporal and impermanent. Such a relationship system of the interdependence of conditioned-arising is always moving and changing at every moment. It is beginningless and endless both in time and space, and its real nature is emptiness.

In conclusion, from the viewpoint of the appearance of the pheno-world, it seems that there something exists. This is the state of possessingness. However, possessingness or

existence is only a process of aggregation / production and separation / extinction of causes and conditions, and is also only a process of changing and transformation, temporal and impermanent. Therefore, the nature of the pheno-world or possessingness is emptiness. But this emptiness is a false-emptiness, because it is not totipotent. However, the false-emptiness or possessingness or the pheno-world is rooted in true-emptiness, which is totipotent.

2. Two Directions and Four Stages of Conditioned-Arising

The conditioned-arising always expresses naturally two directions and each direction again expresses two stages, i.e. total of four stages.

2.1 The Two Directions of Conditioned-Arising

This means that there are two directions of conditioned-arising: conditioned-generation and conditioned-annihilation. According to *The Agamas Sutra*, the direction of conditioned generation is represented as: “Because this is existing, that is existing too; and because this is generating, that is generating too.” “Existing-causes and existing-conditions aggregate the universe, and the universe is aggregated by the existing-causes and existing-conditions.” (Yu, 1991, p. 84; Yin-Shun, 1989, p.140). The conditioned-annihilation is represented as: “Because this is non-existing, that is non-existing too; and because this is annihilating, that is annihilating too.” “Existing-causes and existing-conditions annihilate the universe, and the universe is annihilated by the existing-causes and existing-conditions.” (ibid). Therefore, according to this Buddhist theory, if there are something generated, they must be annihilated.

2.2 The Four Stages of Conditioned-Arising

This means that both directions of conditioned-generation and conditioned-annihilation have two stages, respectively. The first two stages are called “generation” and “existence”, and the second two stages are called “alteration” and “annihilation”. The order of these four different stages is shown in Fig.2.

Generation -----> Existence -----> Alteration -----> annihilation

Fig. 2 The Order of Four Different Stages of Conditioned-Arising

Each of the four stages is actually in continuous changing and moving at every moment just like the wave of water in the sea. According to the *Abhidharma Kosa Sutra* (Young, 1978, pp.168-169), these four stages are described in two categories: the original state (as shown above) and the secondary or following state. Each original state is continuously generating its secondary or following state, shown in Fig. 3.

Due to the continuity of the development from the original state to the secondary or following state, the four stages of the conditioned-arising proceed continuously at every moment. It is the karma-force that promotes these developing processes.

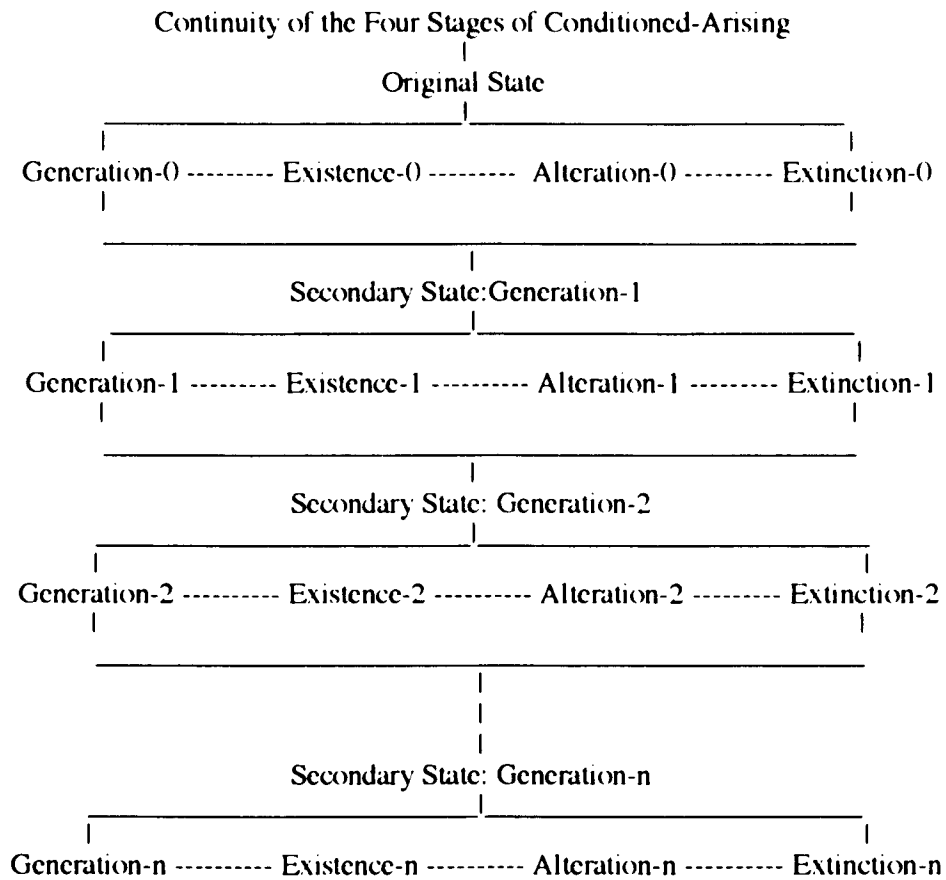


Fig. 3 Continuity of the Development from the Original State to the Secondary State

3. Three-Fold Characteristics

According to Yinshun, this theory possesses three-fold characteristics (Yinshun, 1989, pp.137-140):

(1) *All Effects Arising from Cause and Condition* means that all things or all relative phenomena both spiritual and physical in the universe all arise from relevant causes and

conditions, which are always in moving and changing, and there is no exception. However, this is mentioned from the viewpoint of relative truth, and so only belongs to the relative pheno-world.

(2) *Everything Obeying the Law of Cause and Effect* means that all phenomenal things obey the law of cause and effect (which will be discussed in the next section). This is mentioned from the viewpoint that the pheno-world is governed by this natural principle or reasoning. In other words, this natural principle or reasoning penetrates in all phenomenal things. However, such principle or reasoning itself belongs to the absolute truth and never changes. It is just like Shakyamuni said in *The Samyukt- Agamas Sutra* : “ Whether or not the Buddha appears in this world, this dharma or law or principle always permanently exists in the universe.”

(3) *All Phenomena Established on the Basis of Emptiness* means that although all things / relative phenomena are synthesized by cause(s) and condition(s), changing at every moment and actually being unreal and only illusions, their roots grow in the emptiness or absoluteness.

Therefore, the complete universe (include both animate and inanimate, phenomenon and noumenon) is just like a tree that one half is over ground, the body (branches and leaves), and another half is under ground, the root. The body is equivalent to the pheno-world and the root is equivalent to the noumo-world. The body can be felt directly, but the root cannot. The body can be moved by the wind, but the root cannot. The body will die after cutting down, but the root will not and can grow out new shoots. Before enlightenment, one can only see the body of a tree and cannot see its root, which can only be seen after enlightenment. Thus, if one does not get enlightened, one can not realize the universe completely but only partially and unreally.

However, why the physical world / phenomena, which one can touch and feel them, are incomplete and unreal, and the emptiness, which one can not touch and feel it, is complete and real ? It is because the emptiness is unmoved and unchanged--- the absolute domain. According to Buddhism, it is a principle that something unmoved and unchanged is real and complete (in potentiality), but something moved and changed is incomplete, unreal and only illusion. Human beings or sentient beings are all living in the illusive world just like in the movie, but they do not know by themselves because they are unenlightened and in delusion. Here, the emptiness means true-emptiness and belongs to absoluteness, which can not actually be realized by one's consciousness-wisdom or incomplete-wisdom.

Therefore, one has to release one's true-wisdom or perfect-wisdom to observe the causes, conditions, and effects transcendently and to penetrate the phenomena to attain the final absolute domain --- the true nature or the root of the pheno-world.

4. Twofold Rules

Although there are three-fold characteristics of this theory, its basic rules are two-fold: the relative conditioned-arising and the absolute-extinction. The conditioned-arising rule basically emphasizes on the phenomena / the pheno-world side. It changes in two different periods and four stages as having mentioned before. The absolute-extinction rule represents the unchanged and absolute nature of this theory. It is the real root of the universe and life.

The structure of the two-fold rules of this theory can be shown in Fig. 4.

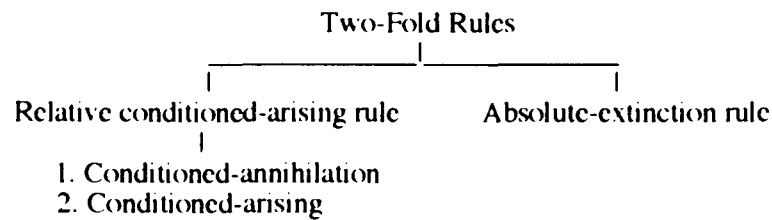


Fig. 4 The Structure of the Two-Fold Rules of This Theory

Therefore, *the theory of conditioned-arising and its emptiness nature* can be also only called *the theory of conditioned-arising*, because the word “conditioned-arising” already includes the meaning of the absolute-extinction or emptiness / true-emptiness.

5. Significance and Importance

Somebody asked Shakyamuni: “ What are your teaching ? “ He answered: “ I am teaching the conditioned-arising.” Thus, we see how important this theory is ! It may be said that the *theory of conditioned-arising (and its emptiness-nature)* is the most important theory or the central idea of the Buddhism.

Therefore, in the broad sense, *the theory of conditioned-arising* can represent all Buddhist theories. It mentions not only the natural phenomena, both of the universe and life, and the existing problems, but also the real absolute nature, both of the universe and life, and the solving approach of the problems.

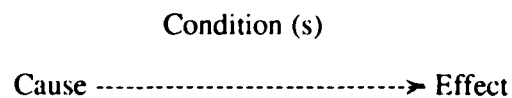
Thus, it is very important to understand this theory completely, especially its two-fold rules.

IV. The Law of Cause and Effect

In Buddhism, the “theory” is the theoretical explanation of both phenomena and noumenon of the universe and life, just as what has been described above. The “law” is the fact of rule or principle which controls / governs only the phenomena of the universe and life, just as what will be mentioned here. There are three points to note: (1) the theory explains both the pheno- and the noumo-worlds; (2) the law only concerns the pheno-world, because the noumo-world is of no form, no phenomenon and also no law; and (3) the root of a law, however, grows in the noumo-world. On the basis of three theories mentioned above, a most basic law, *the law of cause and effect*, was concretized and summarized by Shakyamuni as follows.

1. Definition

The *law of cause and effect* means that every thing / phenomenon, either physical or mental in the pheno-world, is an effect (or a result or a fruit), which arises from another or one major cause, and that the cause has to meet one or several necessary conditions during its development into an effect. This can be formulated as the following formula:



This law operates according to the "principle of corresponding reaction", and the effect may be considered as the response or reaction to the cause. Thus, it can be defined that *the law of cause and effect* is a principle which controls / governs relationships and transformations

among cause, condition and effect in both animate and inanimate pheno-world.

According to Buddhism, the development and transformation of every thing / phenomenon, both material and spiritual, or natural and social, or the interactions among them, are all controlled governed by this law; and it operates not only in this world, but also all over the universe. Furthermore, there is no limitation both of time and space, beginningless, endless and boundless. Therefore, it may also be called *the universal law of cause and effect*.

In Buddhism, according to this law, the effects caused by all kinds of activities of all living beings are called karma-fruits or retribution. Under the control of this law and the direction of karma-fruit-retribution, all living beings and their living world or universe are developed, transformed and transmigrated (these will be discussed in detail latter).

Now, a question would be raised: why does this law possess such a universality ? The answer is that because it is a bridge across between the relative pheno-world and the absolute noumo-world which possesses the potentiality of universality. Therefore, this law takes the double characteristics of the both worlds. The majority of modern scientists may still not know very clear concerning such secret of this law.

2. Functions and Characteristics

According to this Buddhist law, actually a universal natural law, whenever there is a cause, there will be a corresponding and exact effect, unlimited by time. No one, even a Buddha, can be free from this universal natural law. Accordingly, every one, including Buddha, has to keep both of his social activities and natural recognitions under this law. The operation and function of this law are well summed up in a gatha (Wang, 1990 , p.41):

Even with the passing of hundreds and thousands of aeons, one's karma may remain and would not bear the fruit till the cause and conditions meet, and then none but its maker alone would have to bear the fruit of the retribution.

In this gatha, according to Wang, there are three points to be noted (ibid, p.42):

1. Karma, as a cause, would not be nullified by itself even after the lapse of long, long time, same as what was said in Newton's Law of Motion that still things always remained still and moving things were always on the move, and in either case, they would not, by themselves, change their phenomena of stillness and motion, unless intervened by an external force.
2. When the cause and condition meet together, regardless how long and how short this may take, the fruit would be produced eventually, e.g. by the external force, still things would move at once and moving things would either change their direction, or accelerate their speed or come to stop.
3. By one's doing, which is the cause, one gets the fruit automatically, this is to say, for one's happiness or misery, one oneself alone is responsible, and either happiness is reward, nor misery is punishment from God;

Therefore, there are three very important functions and characteristics of this law, which need to be mentioned as follows:

(1) *It is unlimited by time and space*: What time would causes bear fruits ? It varies in every case. In general, it depends what time the cause and conditions meet together and how strong is the power of the cause. If the cause implanted in the past, conditions may meet and fruit may bear either at the present age or in the next generation or more. Sometimes, the cause sown at the present age may also bear fruit in the same generation if conditions may be satisfied immediately or the power of the cause itself is strong enough. If the conditions always can not be meet together for a long long time, the cause may not be eliminated automatically. Once it meets conditions together, the fruit still bears immediately. These mainly belong to the situation of life retribution, but the other natural phenomena are also the same.

(2) *It is specific to individual* : This law is exactly specific to every individual. It means that one's own cause can neither be free from retribution, nor be taken by another proxy for the retribution. Therefore, this law is absolutely equal for and right to every individual. It also works very exactly and precisely. There is no error and no any bias.

(3) *It is beginningless and endless* : According to Buddhism, both the transformation of the universe and the transmigration of the power of life are beginningless and endless. It is the same for this law, which governs these phenomena. Thus, from the standpoint view of the long stream of the universe and life, it can be said that there is neither a "first" cause nor a "last" effect.

In Buddhism, this is the most basic law and the other laws are all related to it. By comparison, *the law of cause and effect* in modern science has been mainly used to realize and analyze the physical world, but has not yet been deeply and widely used to realize and analyze the mental world. Furthermore, it is almost still left unattached that under the control of this law how the mind interacts with its external physical world, how the mind creates its own living features and its own living world or environment, and especially how they are operating in transmigration, which will be mentioned in latter sections.

Biology and other physical sciences still leave these problems unknown now. Therefore, *the law of cause and effect* in modern science is very incomplete. It may be said that this is only a part of *the Buddhist law of cause and effect*.

3. Classification of the Kinds of Causes

In Buddhism, there are three factors for *the law of cause and effect*, i.e. cause, condition, and effect or result or fruit. These three factors need be further analyzed in details. Here, it is first to describe the classification of different types of causes. According to different sutras and sastras, the classifications are different, such as *Yogacaryabhumi Sastra* divides different causes into ten types, but *Abhidharma Kosa Sastra* only divides them into six. It is here only the latter, the 6-division, to be introduced as follows:

(1) *Affective Cause* or *Karanahetu* : It is further divided into two, namely, (a) the empowering or active cause, as the earth empowers plant growth, and (b) the non-resistant or passive cause, as space does not resist everything.

(2) *Co-operative Cause* or *Sahabhuhetu* : It means to be able to operate co-operatively each other, such as the four elements (earth, water, fire, and air), none of which can be omitted.

(3) *Homogeneous Cause* or *Sabhagahetu* : It means the same kind as the effect, i.e. good producing good, etc.

(4) *Mutual Responsive or Associated Cause* or *Samprayuktahetu* : It means to be able to mutual responsive to the effect, such as mind to mental effect.

(5) *Universal or Omnipresent Cause* or *Sarvatragahetu* : It means with relatively universal effects, such as illusion, as of false views, affecting every act.

(6) *Differential Fruiting or Heterogeneous Cause* or *Vipakahetu* : It means its nature and time both different from its effect.

4. Classification of the Kinds of Conditions

According to *the law of cause and effect*, there is no absolute distinguish between cause and condition. The cause can mainly be said for the primary cause but sometimes also be said as a major condition. Thus, the condition can also be said as a secondary or auxiliary cause.

Concerning the classification of conditions or auxiliary causes, it may also be done in several different ways. *Dirghagama Sutra* only divided them into four types, but in the Palitexts they were divided as many as twenty-four. Under the division of twenty-four types of different conditions, all situations of interrelationships between mind and matter, mind and mind, mind and the combination of matter and mind, mind and body, mind and the combination of body and mind, and all other possible combinations, were dealt with in a great

details. Thus, it can be seen here that the most complicated and comprehensive relationships and the greatest diverse and manifold phenomena in both physical and mental worlds have been dealt with scientifically and thoroughly in Buddhism. However, many of them are still unknown in modern sciences (ibid, p. 44).

The classification would not here mention a great details as many as the twenty-four types of conditions or auxiliary causes, but it would briefly introduce the tetrad-classification, the most popular one, as follows:

(1) *Causal Condition*: it means that a primary cause acts as a major condition, actually these two things act as the same thing. For example, cotton is the primary cause of yarn, and wheat is that of flour. As to those cases which mind or mind and matter are concerned, every action of the body, especially that of the mind, belongs to the primary cause.

(2) *Equal Incessant Condition*: this only belongs to the mental condition. It means that the mind or consciousness always acts from moment to moment continually in a successive stream. In such a consciousness stream, the former single thought can always act as an introductory auxiliary cause for the latter one. Thus, the former single thought is called the equal incessant condition for the latter. This is somewhat like Aristotle's efficient cause.

(3) *Condition qua perceived objects* : when the discriminating mind confronts the objects of discrimination, the former is capable of looking upon the latter as the objects of sensation and the latter is capable of acting as conditions to stimulate the former for its discrimination. Thus, the objects of discrimination are called the condition qua perceived objects. This is somewhat like Aristotle's material cause.

(4) *Condition qua contributing factor* : the cause or causes, which affect, either in accordance with, or in opposition to, the subsequent development of the primary cause, are called the condition qua contributing factor or the conditions helping primary cause to grow. This kind of conditions exists in all mental and physical phenomena (ibid, pp. 44-45), and is somewhat like Aristotle's formal cause.

Physical things are produced only in dependence with two of the four, i.e. the casual condition and the condition qua contributing factor, but mental events have to be produced necessarily in dependence with all four conditions.

5. Classification of the Kinds of Effects

According to *Abhidharma Kosa Sastra* , the effect or fruit, produced by combining cause and conditions, can be classified into five categories:

(1) *Heterogeneously Matured Effect* or *Vipakaphala* : it means the effect maturing at different time, or the nature of effect differing from its cause. It is produced by the heterogeneous cause.

(2) *Uniformly Continuous Effect* or *Nisyandaphala* : it means the like effect come from the like cause, such as the former good thoughts produces the later good thoughts. This effect is produced from the *sabhagahetu* or the *vipakahetu* .

(3) *Simultaneous Effect* or *Purusakaraphala* : it means professional effect, such as a farmer cultivating the melon yielding the melon and cultivating the bean yielding the bean. This effect is produced by the *sahabhuhetu* or *samprayuktahetu* .

(4) *Aggregate Effect* or *Adhipatiphala* : it means the effect formed by the aggregation of many different causes. It is generally produced by the *karanahetu* .

(5) *Emancipated Effect* or *Visamyogaphala* : it means transcendental and emancipated from all things. It is produced by the extinction or *nirvana* practice but not by all of six causes..

6. Interrelationships among Causes, Conditions and Effects

According to Buddhism, everything or every phenomena may be the cause or condition of another effect (or result or fruit). The nature of cause, condition and effect is not absolute but only relative, and these three elements can change their nature reciprocally during different time and space. Therefore, the relationships among cause, effect and condition are continuous and net-like. These can be shown in Fig. 5.

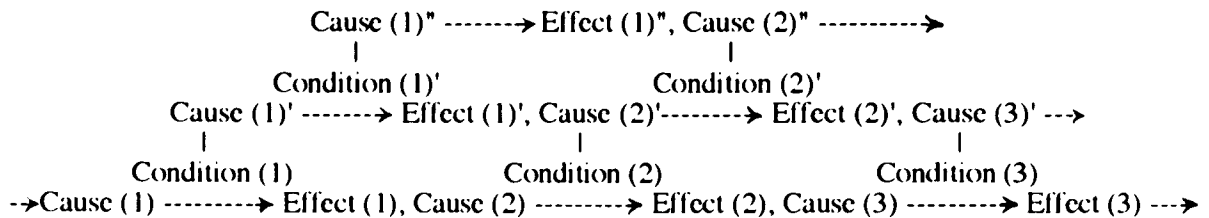


Fig. 5 Continuous and Net-like Relationships between Cause, Effect and Condition

According to *the Buddhist law of cause and effect*, a cause arising or developing into an effect has to meet appreciated condition (s), and different kind of cause needs different type of condition (s) and then produces a certain effect. These relationships, among total of six kinds of causes, four types of conditions and five patterns of effect, can be shown in Table 1.

Table 1 The Relationships among Six-Causes, Four-Conditions and Five-Effects

Causes	Conditions	Effects
<i>Sabhagahetu</i> <i>Sarvatragahetu</i>	Condition qua contributing factor	<i>Nisyandaphala</i>
<i>Karanahetu</i>	Equal incessant condition Condition qua perceived object Condition qua contributing factor	<i>Adhipatiphala</i>
<i>Vipakahetu</i>	Condition qua contributing factor	<i>Vipakaphala</i>
<i>Sahabhuhetu</i> <i>Samprayuktahetu</i>	Condition qua contributing factor	<i>Purusakaraphala</i>
Extinction (beyond 6 causes)	Condition qua contributing factor	<i>Visamyogaphala</i>

From the viewpoint of arising an effect, there are four points to be able to conclude from Table 1: (1) Both effects of *nisyandaphala* and *purusakanaphala* need two causes, in which the cause *sahabhuhetu* is in common. (2) The effect *adhipatiphala* needs all four

conditions. (3) Every effect needs at least 2 conditions, i.e. the causal condition (the cause itself) and the condition qua contributing factor. (4) The effect *visamyogaphala* has already belonged to a liberation one, so it is beyond of all six causes but is proved by the extinction *nirvana*.

Chapter 2 Theory of the Holistic View & the Universal Evolution of Life

I. Introduction and Definition

According to *the theory of dichotomous- / twofold-truths* outlined in Chapter I, *the theory of the holistic view and the universal evolution of life* pertains to relative truth and deals mainly with the pheno-world domain. There are four basic concepts within this theory, which have to in accordance with *the law of cause and effect* and *the theory of the karma-force (seed / bija) and the retribution of life*.

(1) The Buddhist concept of life, or of universal-life, is a very broad and holistic view, including the subjective aspects of the physical-body and mental spirit, i.e. the animate (*sattva*)-world, and also the objective aspect of the physical-world, i.e. the inanimate (*asattva*)-worlds, which are all the expressions or retributions of the karma-forces or wisdom-merits of related life / living-beings.

(2) In the relative pheno-world, the animate (or subjective)-world is the major component, the direct (or subjective)-retribution, and the inanimate (or objective)-world is the minor part, the indirect (or dependent)-retribution.

(3) Both of these two worlds depend on and interact with each other and are transformed from and unified by the same noumenon, *bhutatathata* or awakening-nature. There are, therefore, no absolute boundaries between the two worlds, and they are holistically connected together as a wholeness.

(4) The universal-life / living-beings exist basically in two different types: the delusive and the awakening.

1. Definition of the Animate and Inanimate Worlds

The criterion to distinguish between the animate and the inanimate depends on emotional, sensitive and discriminating capability. The animate exists and the inanimate does not. Thus, according to this criterion, although plants have some basic animate similarities (such as, the structure of cells, tissues, and organs, the function of sexuality, development, inheritance and physiology) and must also belong to the animate, they only belong to the *asattva* but not the *sattva* of the animate.

Therefore, it has to point out that, according to the strict sense of this Buddhist theory, the concept of living-beings does not include plants. It is also, however, necessary to point out here that, according to the broad sense of Buddhist ideas, the concept of life includes both the animate- and the inanimate-worlds, which are the two aspects (the subjective and the objective) of the composition of a whole life, and plants are only a part of it. In this sense, the animate and the inanimate are all called “world”; and their distinctions only have relative meaning.

These ideas are somewhat different from those of the West, although Aristotle’s idea of plant soul is also without emotion and sensation.

2. Definition of the Delusive and Awakening Worlds

Delusion means ignorant of three things:

(1) Life possesses two aspects of the noumo- and pheno-worlds, which unify in wholeness and can not only be attached on the surface aspect of the pheno-world (cf. *the theory of dichotomous / twofold-truths* in Chapter I).

(2) Life possesses two components of the animate (subjective)- and the inanimate (objective)-worlds, which also unify in wholeness and can not be attached to the objective- with the opposition and separation of the subjective-world.

(3) Both the pheno- and inanimate-worlds are relatively false phenomenon, which all appear temporarily from a state of conditioned-arising and are changing, not eternal / radical (cf. *the theory of conditioned-arising and its emptiness-nature* in Chapter I). The state of awakening means obtaining enlightenment about all of these things. Because the states of delusion and of awakening also include both the subjective and objective, they are also called the delusive- and awakening-worlds.

II. The Holistic View of Universal-Life

1. The Holistic View of the Animate and Inanimate Worlds

In this Buddhist theory, the concept of universal-life is very broad, composed by the components of the animate (*sattva*) and inanimate (*asattva*) worlds, or the subjective and objective worlds (Chang, 1971, pp.2-53). As stated above, the animate world is considered as closely interacting with the inanimate world and they are intimately dependent on each other. All living-beings (the subjective) in the universe, therefore, are closely connected with their living worlds (the objective). Thus, within this theory and with such a view of life, Buddhism may be considered as a type of universal eco-biological science.

The Buddhist idea of universe and universal-life can be shown in Fig. 6 and Plate 1 & Plate 2, which are basically divided into two: the Delusive and the enlightened.

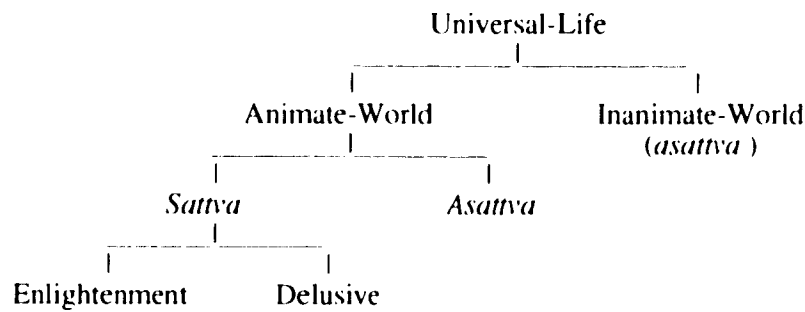


Fig. 6 Composition of the Buddhist Concept of Universal-Life

2. Composition and Holistic View of the Inanimate-World

The Buddhist research objects of the inanimate-world, from the 6th century B.C. until now, are very broad, and are divided into six different categories, as follows.

2.1 Concerning Space

Buddhism holds that the universe has no final boundary. This has three meanings: (1) that space is infinite, boundless and limitless; (2) that there are numerous different kinds of worlds, including the human world, and each kind of world exists repeatedly and numberlessly in the universe; (3) that the whole universe is seen reflected (not this visible universe only, but a vast system and a multi-dimension of universes) in the conceptions of the different hierarchies of living- beings' minds and wisdom.

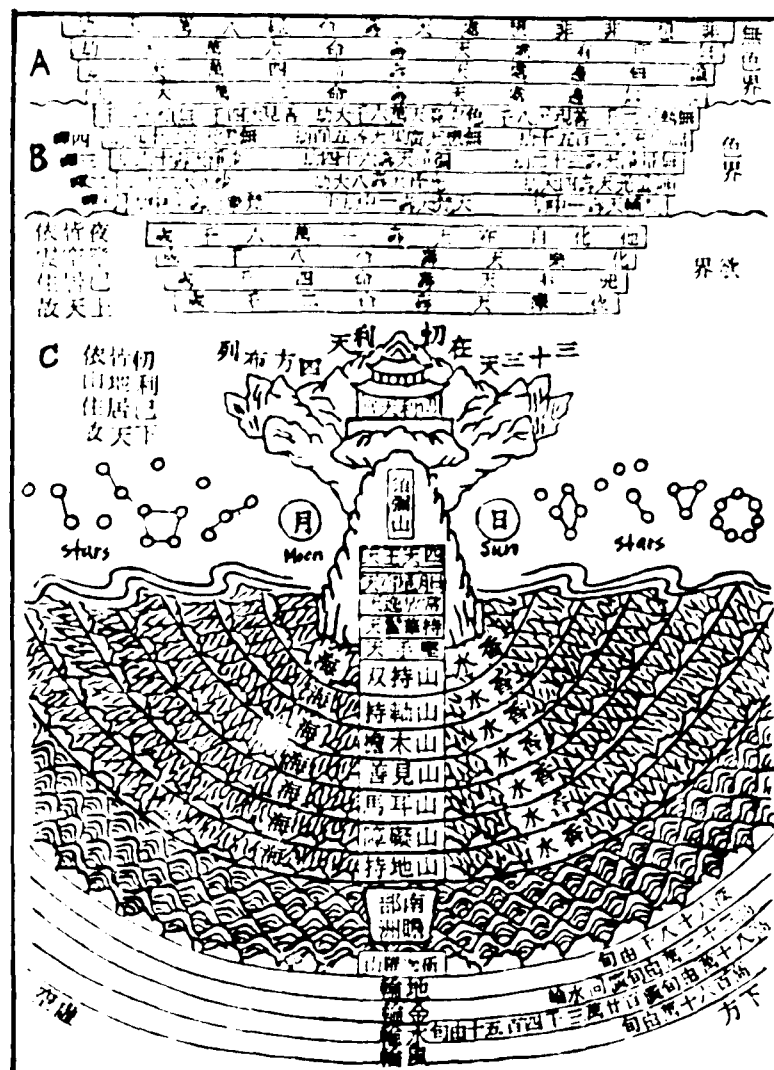


Plate 1 The Structure of the Three-Realms of the Delusive-World Suggested in Buddhism

The three-realms or worlds are: the Desire Realm (A), the Form-with-Realm (B), and the Formless-Realm (C). The more details see Table 3.

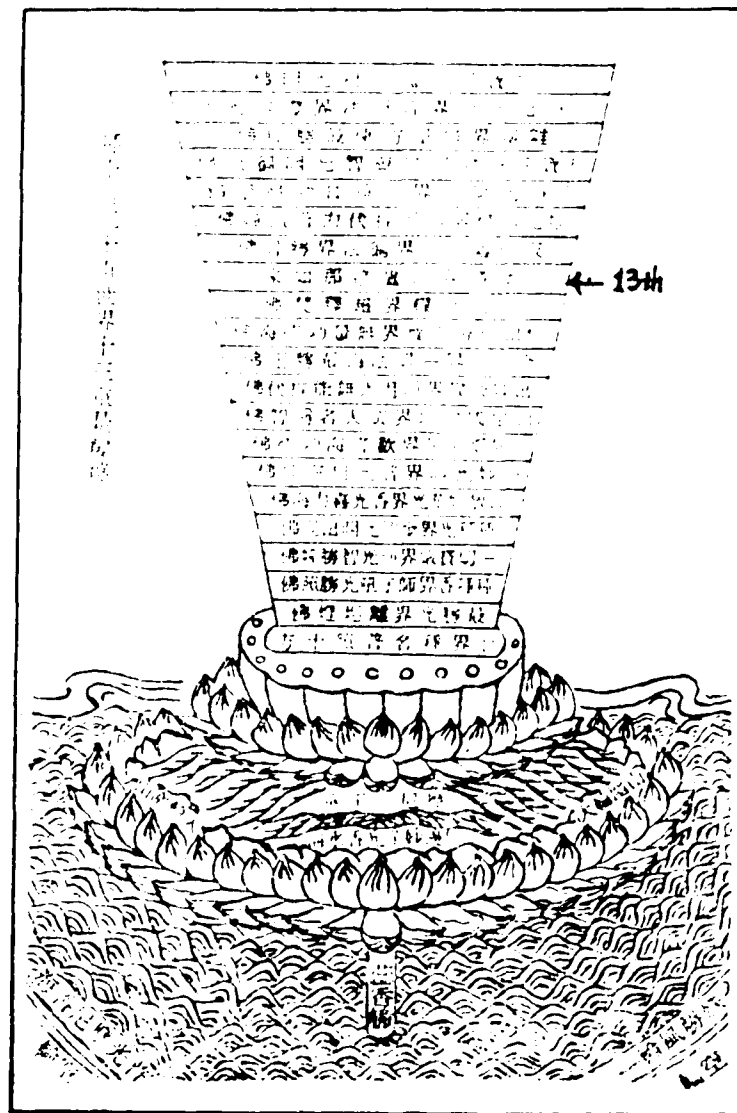


Plate 2 The Structure of the Flower-Ornament-World of the Enlightened-Worlds Suggested in Buddhism (after Young, 1982; and cf. Cleary, tr., 1984).

This is only one of the numberless *world-seeds*. In this world-seed, there is a twentyfold of enlightened-world system. The Shakyamuni's world is on the thirteenth level, called *Saha-Lokadhatu*. The sentient-beings in our present solar-system after enlightenment will transform to enter into this enlightened-world.

In this view of the inanimate world, the human world is not only the earth, but there are numberless others. This point of view is not held by any other science, philosophy or religion .

This view of the boundlessness and limitedlessness of the universe can be seen in many Buddhist sutras. There are some examples to be introduced from the *Avatamsaka Sutra* (or the *Hau-Yen Sutra* , the *Flower Ornament Scripture*):

Why ? Because they know all things are ultimately inexhaustible, because they know all buddha-lands are boundless, ... because they know the present is boundless, comprehending all space and the whole cosmos, ...

(Cleary, 1986, p.164).

Perfectly knowing the cosmos has no bounds and all things are one form, which is formless, ... (ibid,p. 172).

Space has no beginning,
No middle, and no end;
Its measure cannot be found ---
Enlightening beings' knowledge is also thus (ibid, p. 198).

All buddhas can go to all worlds; and all tathagatas attain it everywhere, without leaving behind any phenomenal realms. In each of the ten directions, separately, there are incalculable oceans of worlds; and there are in each ocean of worlds incalculable world systems (ibid, p. 228; with some changes).

All things, all worlds, all sentient beings, ... the range of these phenomena are unlimited, they are only able to know and see by means of unobstructed wisdom. ... Sentient beings are boundless, worlds are boundless, realms of natural law are boundless, ... and the supremacy of the buddhas is also boundless; (ibid, p. 241).

2.2 Concerning Time

Buddhism holds that time is beginningless and endless. This means that, from the view point of the developmnt of a single planet or a single universal system, there must be a beginning and an ending. However, from the view point of the evolution of the whole universe and dealing with the universe as a whole including all of the universal systems, the

universe is also beginningless and endless. Some examples can also be introduced from the *Avatamsaka Sutra* :

Because they know the past has no beginning, because they know the future has no end (ibid, p. 164).

... all times in the cosmos ... are unlimited, ... past, present, and future are boundless ... (ibid, p. 241).

Furthermore, from the Buddhist view, the time is relative and can be transcendental; such as Buddha said in the same sutra:

In a single instant they are able to know countless worlds, becoming or decaying, and also know the continuity and succession of all ages. They are able to manifest countless ages in a single instant without enlarging the instant (ibid, p. 134).

This concentration is called the pure treasury of the past; in a single moment it can enter a hundred eons, a thousand eons, a hundred thousand eons, an octillion eons, countless eons, measureless eons, boundless eons, incomparable eons, uncountless eons, unaccountable eons, unthinkable eons, immeasurable eons, unspeakable eons, untold, inexpressible eons (ibid, p. 137).

These enlightening beings can in a single instant enter one eon, a hundred eons, a thousand eons, a hundred thousand eons, a thousand thousand billion eons; they enter into as many eons as atoms in a continent, as many eons as atoms in four continents, as many eons as atoms in a solar system, as many eons as atoms in a galaxy, as many eons as atoms in a universe, as many eons as atoms in a buddha-land, as many eons as atoms in countless buddha-lands, as many eons as atoms in untold, inexpressible numbers of buddha-lands --- by their wisdom they are able to know the numbers of eons in all future worlds (ibid, p. 138).

2.3 Concerning Size

Buddhism also claims that there are no absolute confines between that which is small, big or large (Chang, 1983, pp.42-43). Many examples are described in the *Avatamsaka Sutra*, such as:

On a hairtip more buddha than grains of sand in trillions of Ganges rivers. . .
 In a single pore are infinite lands, each with four continents and seas,
 As well as polar and peripheral mountains, all seen therein, uncrowded.
 On a point the size of a hairtip are all realms of being
 In the body of each being are various lands, in the lands, beings; (ibid, p.76).

On a point the size of the tip of a single fine hair
 Are unspeakably many Universally Goods;
 The same is true of all hairtips
 All throughout the cosmos.
 The lands on a point the size of a hairtip
 Are measureless, unspeakable;
 As many hairtips as the whole of space
 So are the lands on every single point (ibid, p. 204 ; with some changes).

The realms in space , without bound,
 All are arrayed on a hairtip;
 These lands on a hairtip
 Enlightening beings can tell of in an instant.
 Into a minute pore
 Untold lands enter in succession;
 The pore can admit those lands,
 But those lands cannot fill the pore (ibid, p. 208).

III. The Holistic View of the Animate-World and the Universal Differentiation and Evolution of Life

As stated, Buddhist research objects of the inanimate-world are very broad, and that of the animate-world are the same. Not only the concepts of the animate-world of Eastern Taoism and Confucianism, but also that of Western Aristotelian and modern biology, are all much narrower than that of Buddhism

In this section, although the animate world is mainly emphasized, it is still considered to be unified with the inanimate-world. In this point of view, the theory raises the conceptions about the universal differentiation and evolution of life. Thus, it may be also said that Buddhism is a kind of universal evolutionary biological science.

1. The Delusive and Enlightened Worlds: the Ten Dharma-Realms

As mentioned before, the universal-life is basically differentiated in the existence of two basic types of worlds: the delusive and the enlightened. The delusive-world of life, according to the degree of delusion, is further differentiated into six sub-types of worlds, called six-ways /-realms or *gati*. They are: (1) *deva-gati* (heaven-way), (2) *manusya-gati* (human-way), (3) *asura-gati* (natural-spirit), (4) *Tiryagyoni-gati* (animal-way), (5) *preta-gati* (hungry-ghost), and (6) *naraka-gati* (hell-being).

The enlightened-world of life, according to the degree of awakening / enlightenment, is also further distinguished into four sub-types of worlds, called four holy-ways / realms. They are: (1) Buddha-realm, (2) Bodhisattva-realm, (3) Pratyeka-buddha-realm, and (4) Sravaka-realm. Thus, there are total of ten different realms, and they are called ten-dharma-realms.

These can be shown in Table 2 and Fig.7.

Table 2 Differentiation of the Ten Dharma-Realms of the Universal-Life

Two Types of World	Enlightened	Delusive
Ten Dharma-Realms	(1) Buddha (2) Bodhisattva (3) Pratyeka-buddha (4) Sravaka	(5) <i>Deva</i> (6) <i>Manusya</i> (7) <i>Asura</i> (8) <i>Tiryagyoni</i> (9) <i>Preta</i> (10) <i>Naraka</i>

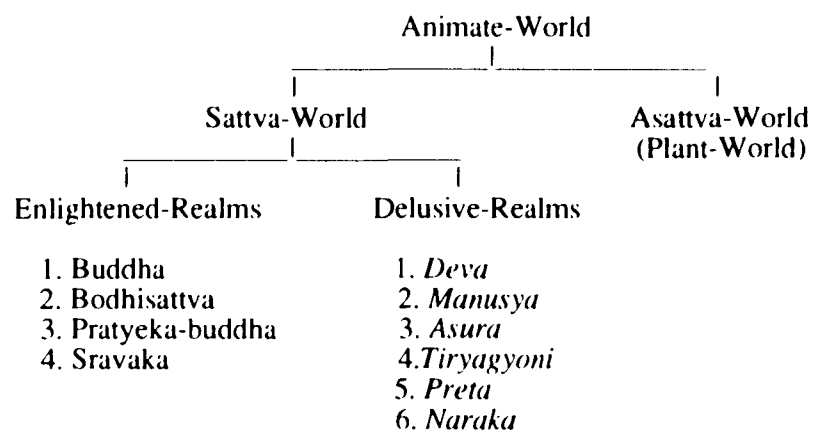


Fig. 7 Composition of Universal-Life and the Differentiation of the Animate-World

From Table 2 and Fig.7, it can be seen that, in this theory on the basis of two divisions of the delusive- and enlightened-worlds, the universal-life is totally differentiated into ten

hierarchies / realms. In general, it can be said that these ten hierarchies of universal-life are in the process of evolution. The evolutionary direction is upward from the lowest hierarchy, *naraka* (hell-being) in the deepest state of delusion, towards the highest hierarchy, that of Buddhahood where the highest level of awakening / enlightenment is attained. Thus, complete and thorough enlightenment for every universal-life is the final goal in the Buddhist view of the universal evolution.

However, there is a border line between delusive and enlightened two basic-worlds, which is awakening / enlightenment. This means that, before enlightenment, universal-life is under a delusive situation, living in a delusive form / world. It is generally called sentient-being as it is differentiated in six-ways.

The evolutionary direction of these six-ways, although in general is upward, before enlightenment remains uncertain, and is completely determined by karma-force, which are created by sentient-beings themselves and are controlled by the law of cause and effect (cf. Chapter 1 and Chapter 5). If the nature of karma-force is good, then the evolutionary direction is upward; and if bad, then downward.

Therefore, in the delusive realm, the evolutionary direction among six-ways is always expressed phenotypically up and down, although potentially in the long run, it is still upward. These will be further discussed in Chapters 6.

One very interesting thing to point out is that the cause or dynamics, in the Buddhist view of evolution, is principally not physical and outer but mental and inner, controlled by *the law of cause and effect*. This kind of view is somewhat similar to that of Lamarck but not Darwin, in the Western theories of evolution, and will be further discussed in Part III.

After crossing the border line of enlightenment, the enlightened universal-life enters into the awakening / enlightened realm and is called a holy-being. Among these four hierarchical realms, the evolutionary direction is fixed always upward and no longer downward. The dynamics of evolution in this awakening basic-realm is solely caused by the promotion of the

level of enlightenment and the increase of wisdom. This process is called “transforming consciousness into wisdom”.

2. Differentiation of the Three-Worlds in Six-Ways

It has been held above that according to this theory, the cause or dynamics of the universal evolution is mainly determined by mental force and inner situation under the control of *the law of cause and effect*. According to this view, the six-ways can be classified into three worlds: the desire-world, the form-with-world, and the formless-world.

(1) The desire-world is characterized by its sentient-beings to be full of different desires, such as that of eating, sexuality, sleeping, and many other social desires.

(2) The form-with-world is characterized by its sentient-beings that although they no longer have any desires, they still possess physical bodies, which may be even with very fine and light form and mass.

(3) The formless-world is characterized by its sentient-beings to be both without any desires, and without any physical body or form and mass. These sentient-beings only have mental spirit, consciousness, or mind force. The composition of these three worlds of six-ways are shown as in Table 3.

Table 3 Differentiation of the Three-Worlds of Six-Ways

Worlds	(1) Desire	(2) Form-with	(3) Formless
Ways	(1) <i>Deva-gati</i> (6 <i>devas</i>)	<i>Deva-gati</i> (18 <i>devas</i>)	<i>Deva-gati</i> (4 <i>devas</i>)
	(2) <i>Manusya-gati</i>	---	---
	(3) <i>Asura-gati</i>	---	---
	(4) <i>Tiryaggyoni-gati</i>	---	---
	(5) <i>Preta-gati</i>	---	---
	(6) <i>Naraka-gati</i>	---	---

Table 2-2 shows that the *deva-gati* is the most complicated one of the six-ways: (1) there are total of twenty-eight different hierarchies, and (2) they are distributed in all of the three different worlds. From another point of view, the desire-world is also a very complicated one in the three worlds, as it includes all of the six-ways. The three worlds also indicate the three levels of evolutionary hierarchies, which are mainly determined by the mental and inner situation levels.

3. The Differentiation of Two-Categories of the Six-Ways

According to the nature of karma-force, created mainly by mental activity, whether is good or evil, the six-ways /-realm or *gati* can also be classified into two categories: the upper (three good-ways) and the lower (three evil-ways), shown in Table 4.

Table 4 Differentiation of Two Categories of the Six-Ways

Categories	Upper	Lower
Karma-Nature	Good-Ways	Evil-Ways
1	<i>Deva-gati</i>	<i>Tiryagyonigati</i>
2	<i>Manusya-gati</i>	<i>Preta-gati</i>
3	<i>Asura-gati</i>	<i>raka-gati</i>

In Table 4, the upper and the lower categories also represent the evolutionary direction of the sentient-beings in the six-ways.

4. The Differentiation of Two-Ranks of the Three-Worlds

According to the mental condition whether the minds of sentient-beings are concentrated or not, the three worlds can be classified into two ranks: concentrated and unconcentrated, shown in Table 5.

Table 5 Differentiation of Two Ranks of the Three-Worlds

Ranks	Concentrated	Unconcentrated
Worlds	Form-with-World Formless-World	Desire-World

5. Principles of Transcendence, Obstaclelessness, Roundness or Wholeness

There are two basic Buddhist research principles for the inanimate world, or the relative physical pheno-world. The first is to transcend it and to get into the absolute noumo-world. The second is further to integrate the absolute noumo-world with the relative pheno-world and to reach the obstaclelessness, roundness, wholeness or perfect harmony.

These principles are special characteristics of Buddhism, especially the latter which is never raised both by Western science or philosophy. According to Buddhism, the inanimate world is completely controlled by Buddhist natural law, and there is no special creator.

In *Hinayana* Buddhism, the inanimate world is mainly described in one of the four *Agama Sutras*, the *Dirghagama Sutra* and in the *Abhidharmakosa Sastra*. In *Mahayana* Buddhism, it is mainly described in the *Avatamsaka Sutra*.. These two sutras are all the early talking of Shakyamuni.

Chapter 3 Theory of Wei-Consciousness for the Universe and Life

I. Introduction and Definition

The last three Buddhist theories describe a holistic view of life: its noumenon and phenotype, classification and evolution, and how it is conditioned-arising and controlled by universal-laws. On the basis of these, the *theory of wei-consciousness* considers on analysis of the composition and formation of mind and the universe. Here, “wei-consciousness” is equivalent to “Wei-Shih” from the Chinese pronounced direct-translation. “Wei” means mere, only, or sole; and “Shih” means consciousness, or false-mind. The name of *the theory of wei-consciousness* is mainly originated from the *Doctrine of Mere-Consciousness* or the *Ch'eng Wei-Shih Lun* (Hsuan-Tsang, Wei, T., tr. from Chinese, 1973).

The *theory of wei-consciousness* holds that: Firstly, due to ignorance / *avidya*, two types of adhesions / *graha* (the *atman* / *atmagraha* : the subjective and the *dharma* / *dharma-graha* : the objective) and two-barriers / *avarana*s (the vexation / *klesavarana* : the subjective and the *mahabodhi* / *jneyavarana* : the objective) are formed. Secondly, because of these adhesions and barriers, the nature of biasing-imagination / *parikalpitasvabhava* and the transformation of the true-mind and true-wisdom into eight consciousnesses are formed. Thirdly one is ignorant of the truth of the nature of dependence on others / *paratantrasvabhava*, which means that all phenomena, both animate and inanimate, are really false: relative, temporal, all in a state of change, and being formed by conditioned-arising / dependent-origination. Finally, one remains ignorant of the truth of the nature of ultimate reality / *parinispannasvabhava* which holds that there exists real, absolute, eternal, non changing, non producing and no annihilating entity of noumenon, behind / beyond all false phenomena.

In this analysis, all sentient-beings are considered to be in a delusive state, ignorant of the reality of the universe and life. This theory further claims: (1) Delusive sentient-beings have to overcome ignorance, adhesions, barriers, and the nature of biasing-imagination. They need to realize the truth of the nature of dependence on others and the nature of ultimate reality. (3) They need further to transform consciousness into true-wisdom and recover the true-mind. Then finally, they can reach the highest hierarchy of awakening / enlightenment. In this condition, they can unify phenomena and noumenon together, use them automatically, naturally, without adhesions barriers. Thus, one can always stay at the mean / *madhaya*, actually transcending the mean, achieving the Buddha realm of wholeness or *nirvana*.

According to this theory, the whole universe can be described by the following *gatha*:

The three-worlds are merely made / transformed from one's pure-mind;

All dharmas / universal-things are only expressed / transferred by one's consciousness.

These concepts are different from Idealism in Western philosophy. Many people hold the concept of Idealism, but it is not synonymous with the concept of wei-consciousness. The differences become obvious, if one thoroughly understands the latter. However, this theory places more emphasis on the analyses of the pheno-world, although it finally regresses back to the noumo-world. Therefore, it is nearer to Western science.

Based on Shakyamuni's teaching, this theory was developed by Asanga (300-380) and Vasubandhu (320-400), especially the Vasubandhu's two important works *the Vulyamatrasiddhi-vimsakakarika Sastra* and *the Vulyamatrasiddhi-tridasakarika Sastra* in India in the fourth-century. It was further developed by Hsuan Tsang (600-664) in his work of *the Vidyamatrasiddhi* or the *Doctrine of Mere-Consciousness* or the *Ch'eng Wei-Shih Lun* in China in the seventh-centur

II. Classification of Universal-Things: Life, Mind and Matter

In wei-consciousness, the whole universe and life, all of the mental and the physical or the animate and the inanimate, can be summarized and classified into “five-categories and one-hundred-dharmas / things” (Hsuan-Tsang, Wei, tr., *The Doctrine of Mere-Consciousness*, 1973; Young, 1989, pp.16-55). In this work, only the “five-categories” and some major ones of the “one-hundred-dharmas / things” are introduced.

1. *Citta* (king-Mind) Category and Eight Dharmas

According to *the theory of dichotomic- / twofold-truth* (see Chapter 1), it first divides the mind into two: the *citta* (king-mind, power-mind, fundamental-power-mind, directive-mind, controlling-mind, or consciousness) and its *caitta* (mind-faculty, concomitant-mind-functioning, associated-mental-activity). The former is the power center of the mind and the latter consists of the functions of king-mind. King-mind / mind-power directly originates from and is transformed by true- / pure-mind, and therefore, it is not true- / pure-mind itself. King-mind / power-mind is synonymous with consciousness / *viñāna*. Here, power-mind will be discussed first, and the mind-functioning will be considered next.

The first category of the universal things and life is the king-mind / power-mind. This category is differentiated into eight dharmas, i.e. eight consciousnesses. They are: the eye / *cakṣur-viñāna*, the ear / *śrotra-v.*, the nose / *ghrāṇa-v.*, the tongue / *jihva-v.*, the body / *kāya-v.*, the sixth / *mano-v.*, the seventh / *klista-mano (manas)-v.*, and the eighth / *ālaya-v.* The differentiation of these eight consciousnesses is in accord with the rule of the theory of dichotomic / twofold truth, and is shown in Fig. 8.

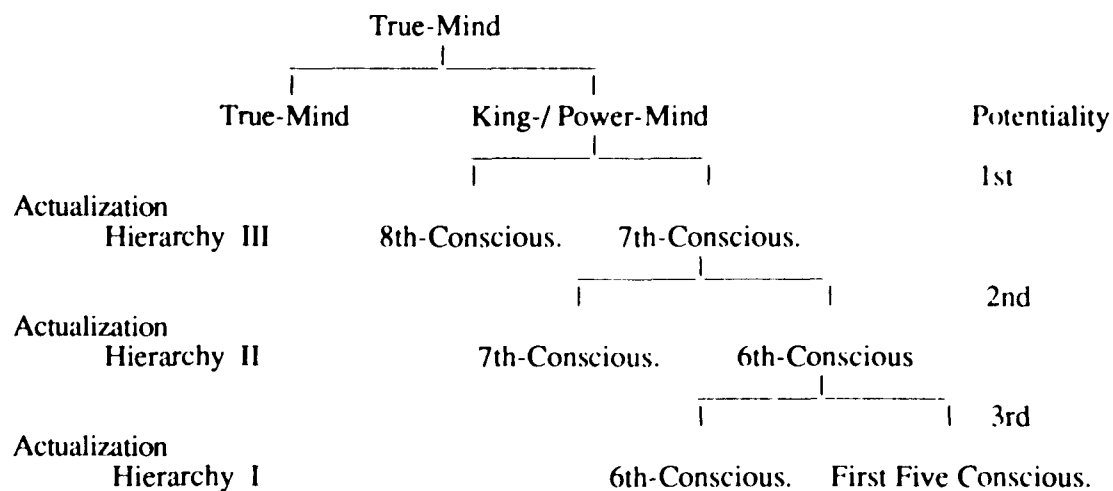


Fig. 8 Dichotomic Differentiation of the Eight Consciousnesses from True-Mind

Although the first five consciousnesses are listed together, generally only one of the five which can be differentiated from the sixth-consciousness in the same time. This is a rule of the activity of the first five consciousnesses. Furthermore, these eight consciousnesses can be classified into three hierarchies as follows.

(1) Hierarchy I, the low level, includes the first six consciousnesses, which are really belonging to the nature of consciousness and interact with the outside six-objects / -dusts in different degrees. These consciousnesses can be further subdivided into two levels: (i) the first five, which are equivalent to the five senses of Western physiology; and (ii) the sixth, which is equivalent to the consciousness of Western psychology.

(2) Hierarchy II, the middle level and also a key level, is the 7th-consciousness, which may be called idea and is a bridge between the 8th- and the 6th-consciousnesses. However, the seventh lacks any equivalent in Western psychology. Although the idea of ego is somewhat similar to the seventh, there are still some differences between the two.

(3) Hierarchy III, the high level, is the 8th-consciousness, which can be called the mind (the false-mind means aggregation) and is the root of the other seven consciousnesses. This also lacks any equivalent in Western psychology.

The classification of eight consciousnesses can be shown in Fig.9, and their functions will be discussed in details in latter section.

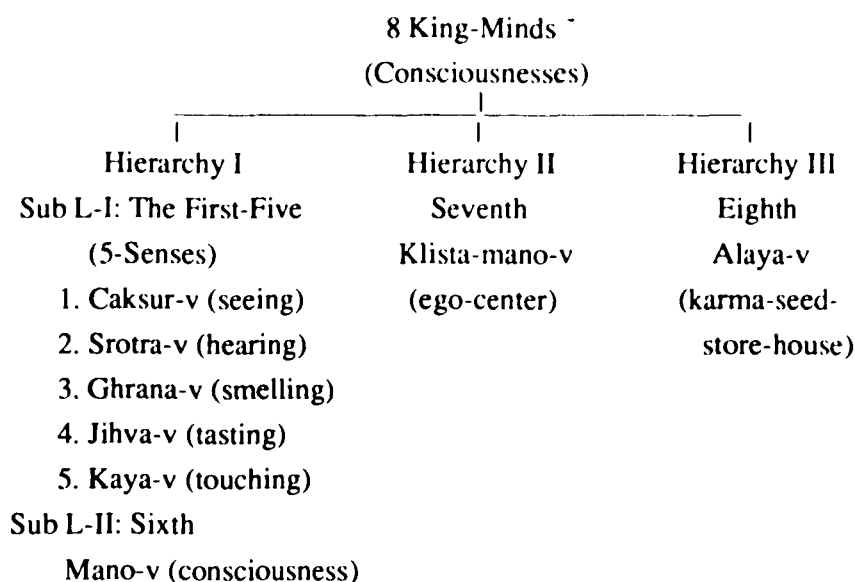


Fig. 9 Classification and Different Hierarchies of Eight King-Minds (Consciousnesses)

2. *Caitta* (Mind-Faculty) Category and Six-Types / Fifty-One Dharmas

The second category is the *caitta* / mind-faculty, or the mental functioning of the *citta* (king-mind / power-mind). This category is differentiated into total of fifty-one *caitta-dharmas*, and are divided into six-types. The dharma-number of each type is different, and the distribution of these three things can be shown in Table 6.

Table 6 Summation of the Six-Types of Fifty-One *Caitta-Dharmas*

Name of Types	<i>Caitta-Dharma</i> Number
Universal	5
Special	5
Good	11
Vexing-Passion	6
Secondary-Vexing-Passion	20
Indeterminate	4
Total	51

These six types are described as follows.

(1) *Universal / Omnipresent-Caitta* is the type of mind-faculty, which possesses functions which are not limited by time, space, nature, or other things. There are five *caittas* / dharmas of this type of mind-faculty. They are: mental-contact (*sparsa*), attention (*manaskara*) sensation (*vedana*), conception (*samjna*), and volition (*cetana*).

(2) *Special / Vibhavana-Caitta* is a state in which ideas or mental states arise according to various objects or conditions toward which the mind is directed, e.g. if toward a pleasing object, then desire arises. There are also five *caittas* belonging to this mind-faculty. They are: desire, super-understanding, memory (*smrti*), contemplation (*samadhi*), wisdom (*prajna*).

(3) *Good-Caitta* holds that virtuousness arises from a good mind and is good both for oneself and others, in this life and the next. There are eleven *caittas* / dharmas belonging to this mind-faculty, such as: faith (*sraddha*), ashamedness, and diligence.

(4) *vexing-passion / klesa-Caitta* is a consideration for the distress, worry, or trouble which disturbs the bodies and minds of sentient-beings and makes them upset. It is also called illusion (*moha*) or barrier (*avarana*). There are six (or in the detail of ten) fundamental ones of this *caitta* / dharma, such as: covetousness (*raga*), anger (*pratigha*), or ignorance (*avidya*). These three vexations are the root of all evil dharmas, and are called the three-poisons.

(5) *Secondary-Vexing-passion / Upaklesa* is for the vexations which arise following the fundamental ones. There are total of twenty of this type of *caittas* / dharmas, such as: fury (*krodha*), enmity (*upanaha*), and vexation (*pradasa*).

(6) *Indeterminate / Aniyatas-Caitta* is a state for those which are not necessarily good or bad or non-defined, and it is not necessarily associated with all minds. There are four of this type of *caitta* / dharma. They are: remorse (*kaukrtya*), drowsiness (*middha*), intellectual-reflection (*vitarka*), and investigation (*vicara*).

These six-types of fifty-one *caitta-dharmas* are the basic activities / functions of the eight *citta-dharmas*, of which some are good and some are bad. This classification and underlying understanding of the behavioral activities and functions of mind / consciousness seem much more complete and in greater detail than Western psychology. The relationships between mind (*citta*) and consciousness (*caitta*) will be discussed in the next section.

3. Matter Category and Eleven Dharmas

The third category of the universal things and life is matter. This category includes eleven dharmas, which can, according to the dichotomic rule, be divided into two groups, the subjective and the objective, shown in Fig. 10.

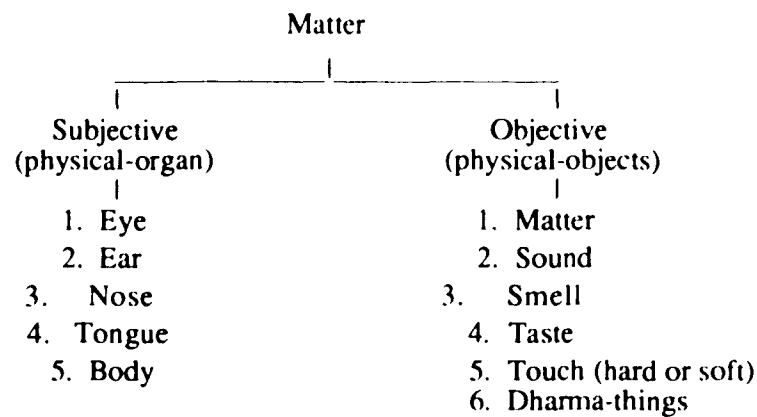


Fig. 10 Classification of the Subjective and the Objective Matter

In Fig. 10, there are two things to point out. (1) All of the first five consciousnesses / senses have physical-organs as their “root”, although the physical-organ, brain, is not the “root” of the sixth consciousness. The brain is only the central “root” of the first five consciousnesses, and the “root” of the 6th consciousness is the 7th-consciousness (the root of the 7th is the 8th). (2) The sixth group of physical-objects is a special group of matter, which is very fine and can not be felt by the first five consciousnesses / senses. It can only be felt by the 6th consciousness.

This sixth matter of dharma-things can be divided into five types. They are called: smallest-matter, farthest-matter, rule-induced-matter, meditation-induced-matter, and illusion-produced-matter.

(1) *Smallest-Matter* means the smallest physical particle, which can not be further divided and is a border-unit between material-particle and void, i.e. the mote-near-void mentioned before in the *Surangama Sutra*.. According to this theory, there are three hierarchies concerning the micro-unit of matter, which can be listed in Table 7.

Table 7 Three Hierarchies of the Micro-Unit of Matter

Hierarchy	Visibility	
	Visible	Invisible
I	Micro-Dust Rabbit-Hair-Dust	Water-Dust Gold-Dust
II		Micro-Quantity (Atom)
III		Mote-Near-Void (Smallest) Farthest (Shapeless/Massless)

Because of the indivisibility of mote-near-void, it has no mass nor direction and is the smallest basic particle / unit of the physical world, somewhat like the basic particles in modern quantum physics. An aggregation of seven mote-near-void makes up a micro-quantity, also called an atom (somewhat like Democritus' atom). An aggregation of seven atoms makes up a gold-dust, which possesses the size able to move between gold particles. An aggregation of seven gold-dust makes up a water-dust, which possesses the size to be able to move between water particles. These particles mentioned above are all invisible. An aggregation of seven water-dust then makes up a rabbit-hair-dust, which possesses the size as the top of a rabbit hair, and this kind of particle is visible.

(2) *Farthest-Matter* means the smallest unit of formless / shapeless and massless things such as light and color, which can be separated in space further than the matter with form / shape and mass. This is at the border line between shapeless / massless matter and void.

(3) *Rule-Induced-Matter* means a special kind of matter which is produced in the body by a strong desire to Buddhist rules (commandments) as conditions. This sort of special matter has the special function to defend the evil things from the body, mouth, and mind from evil things.

(4) *Meditation-Induced-Matter* holds that the five kinds of matter, i.e. color, sound, smell, taste, and touch, which are temporarily produced by the meditation-power of Bodhisattvas over the 8th-position (of the total of ten positions) are for the purpose of the enjoyment of sentient-beings. These are called matter produced by liberation or the real matter based on the effect of meditation. This is not constructed from different sizes of physical particles. It is very interesting to note that they may be condensed and constructed by meditation-power / energy directly and not necessarily constructed from different levels of physical particles.

(5) *Illusion-Produced-Matter* is the purely delusive / false matter produce by the false / illusory discrimination of the single-arising-6th-consciousness, one of four types of the 6th consciousness. This single-arising-6th-consciousness arises separately and need not originate from the first five consciousnesses / senses. Thus, it does not necessarily arise by the stimulation of physical object, and therefore, the imaginary things, which arise from this kind of the 6th-consciousness, are purely illusory.

4. Non-Interrelation (Abstract) Category and Twenty-Four Dharmas

The non-interrelation (relativity) or abstract category is a group of dharma / things, which belong to neither to matter, power-mind, nor mind-faculty, but are established on the

bases of the three. They belong to a very broad group of relative and abstract dharma / things with a total of twenty-four. Here, it is only to introduce those almost half of them, which are most related to life.

(1) *Life-Root* means the root of life reincarnation, namely, the seeds of causes which arise in the 8th-consciousness maintaining a period of years of present life-time. These seeds of causes are accumulated during one's past life-times. Life is continuous because of this life-root or the 8th-consciousness (actually, the final true basis is self-nature or *bhutatathata*).

(2) *Similarities* means that basically similar karma-forces of a sentient-beings lead to the possess of the relatively similar body-types in same ways (*gati*). There are six basic ways. According to different degrees of similarity, there may be divided into many groups, and this is the basis for the classification of sentient-beings in cosmic-biology.

(3) *Dissimilarities* is the opposite of similarity. If there are similarities, there must be dissimilarities. Sentient-beings are, first, different from the holy-beings, due to two barriers: the *klesavarana* and the *jneyavarana*. They are, second, different from each other. Both similarities and dissimilarities are the retributions transformed from the karma-seeds stored in the 8th-consciousness.

(4) *Generation / Birth* means to generate something from nothing concerning the dharmas of the mind and matter.

(5) *Maintaining* is about a temporary maintenance and utilization of the event of generation or life.

(6) *Aging / Old* is about the destruction of the event of generation or the senescence of life.

(7) *Annihilation* is about the regression of the event of generation or life to annihilation or void.

(8) *Transmigration / Samsara* means that the mind and all things are continuously and instantly in a state of the flow and return of birth and death, generation and annihilation.

(9) *Speed* means that birth and death / generation and annihilation of all universal-things occurring very rapidly.

(10) *Order* means that the phenomena of generation and annihilation, flow and return are in serious order and sequence.

(11) *Direction / Space* means that position of the spatial directions of all physical-things possess six directions: front and rear, left and right, upper and below.

(12) *Time* is about the position of temporal continuity of all universal-things and life. The concept of the distinction of discontinuity of past, present, and future only has a relative and convenient sense, because it is without absolute discontinuity. Discontinuity distinguishes on the basis of continuity; if without continuity, there is discontinuity too.

(13) *Number* is about the measurement of the quantity and differences of universal-things.

(14) *Integration* means all the universal-things and are dependent on arising from the integration of various cause and conditions, without exception.

(15) *Disintegration*, the opposition of integration, holds that although all universal-things and life arise from the integration of various causes and conditions, these causes and conditions subsequently and surely disintegrate / disassociate. And so, all universal-things and life must surely decay / old and finally be annihilated.

5. Non-Action / Non-phenomenon Category and Six Dharmas

The category of non-action / non-phenomenon / *bhutatahata* is the basis or noumenon of the other four categories. This is called non-active-dharma, and the other categories are called active-dharmas. Non-active-dharma is without action and beyond language and thought, and is synonymous with the meaning of *bhutatahata*. It can be also called languageless-*bhutatahata*. According to its original meaning, there is neither anything to say nor anything to think, not even its name. Its name, here to be held, expresses from and purely for convenience.

Bhutatahata can be divided into two kinds: (1) languageless-*bhutatahata* which is objectively and absolutely original, beyond language and thought which can only be experienced by personal practice and verification; and (2) language-*bhutatahata* which can be realized theoretically in language and thought but its function is conceptual, for the convenience of understanding, practice and verification of the objective true one (this will be further described in Chapter 7).

The non-action category can be divided into six dharmas. The five of the six basically belong to the category of language-*bhutatahata*, and are the partial verification experiences of the practice process, using certain methods. They are highly specialized and are not considered here.

The classification of the universal-things in this theory also agrees with *the theory of one-bhutatahata* and *the theory of dichotomic / twofold truth*, and is diagrammatically shown in Fig.11.

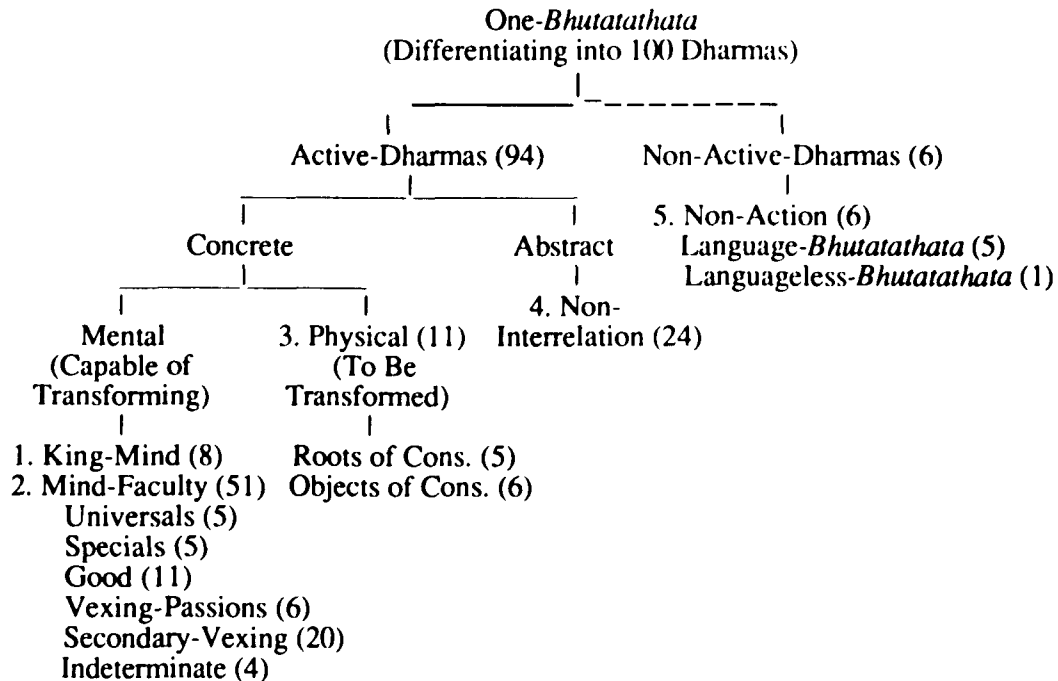


Fig. 11 Dichotomic Classification of Five Categories and One-Hundred Universal-Dharmas (1 to 5 indicate five categories. Number in brackets indicates the Nos.of dharmas)

III. The Functioning-Structure of the Mind

1. The Common Functioning-Structure of the Mind

1.1 Three Structural Hierarchies of the Mind

In the above section, eight differentiated false-minds / consciousnesses have been outlined, and these can be classified into three hierarchies for their macro-structure (see Figs. 3-4 and 3-5). The micro-structure of every false-mind / consciousness, from the first five to the eighth, also further exists in one of three hierarchies, and each hierarchy can be divided into two. These are shown in Fig.12.

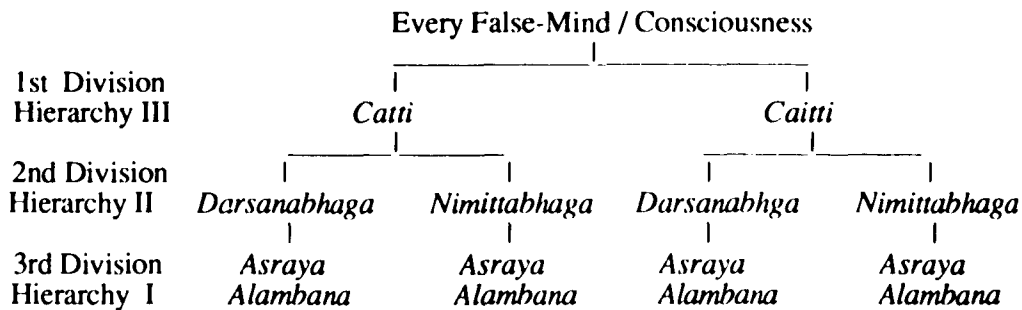


Fig. 12 Three Hierarchies of the Dichotomic Divisions of False-Minds / Consciousnesses

In Fig.12, it can be seen, in applying the rule of dichotomy, that: (1) each false-mind / consciousness first is divided into two, the *citta* (king- / power-mind) and the *caitta* (mind-faculty / -associate), i.e. hierarchy III; (2) then each of these is divided into two more, respectively, the *darsanabhaga* (subjective-perceiving-division) and the *nimittabhaga* (object-perceived-division), i.e. hierarchy II; and (3) finally, each of the latter is divided into the other

two, respectively, the *asraya* (dependent-basis, belonging to the subjective) and the *alambana* (perceiving-object, belonging to the objective), i.e. hierarchy I.

1.2 Three Functional Hierarchies of the Mind

From a functional standpoint, the false mind can be also divided into three hierarchies, shown in Table 8.

Table 8 Three Hierarchies of the Functioning-Structure of the False-Mind

Hierarchy	Name	Function
III	Mind / <i>Alayavijnana</i> 8th-consciousness	Accumulation
II	Idea / <i>Manas</i> 7th-consciousness	Cogitation
I	<i>Manovijnana</i> 6th-consciousness	Understanding Discrimination

1.3 Three Temporal Discriminations of the False-Mind / Consciousness

There are three types of discrimination capabilities of the false-mind / consciousness and they all relate to time. (1) Self-natural-discrimination is a direct function, which discriminate the present object without comparison or inference. (2) Idea-following-discrimination is a function which follows, recalls and discriminates past ideas. (3) Calculating-measuring-discrimination calculates, measures, and discriminates past, present, and future

issues. These three discriminative functions distribute the eight different consciousnesses differently, shown in Table 9.

Table 9 Distribution of the Three Different Types of Discriminative Function in Eight Different Consciousnesses

Discrimination	Time	Consciousness
Self-Natural	Present	the First Five, 6th, 7th, 8th
Idea-Following	Past	6th
Calculating-Measuring	Present	7th
	Past / Future	6th

1.4 Three Spatial Perception of the False-Mind / Consciousness

From a spatial point of view, When the false-mind / consciousness perceives external objects, three different types exist. (1) The direct-appearing-object type means that the self-form of an object appears and is perceived directly and correctly without any conceptual inference. (2) The indirect (comparative)-appearing-object type means that the form of an unknown object appears is perceived indirectly by comparison with other known objects. (3) The false (delusive)-appearing-object type means that, incorrect, false and delusive object appear and are perceived by illusion.

Before attaining enlightenment, the first two types of perception are relatively correct. However, due to the existence of ignorance and attachment, they also belong to illusory states. Therefore, they are called the pseudo-direct-appearing-object and the pseudo-indirect (comparative)-appearing-object, respectively. After achieving enlightenment, when one's

ignorance and attachment are removed, they are then called the true-direct-appearing-object and true-indirect (comparative)-appearing-object, respectively.

These three types of appearing-objects are not distributed similarly in each of the eight consciousnesses, as demonstrated in Table 10.

Table 10 Distribution of Three Types of Appearing-Objects in Eight Consciousnesses

Consciousness	Appearing-Object
First Five	Direct-Appearing-Object
6th	Direct-Appearing-Object Indirect-Appearing-Object False-Appearing-Object
7th	False-Appearing-Object
8th	Direct-Appearing-Object

Table 10 shows that: (1) The first five and the 8th-consciousnesses only have direct-appearing-objects. In this case, the perceptions of this consciousness are relatively true, but it is without the ability of inference. (2) The 7th only has False-appearing-object. Thus, the perception of this consciousness is always delusive and without the ability of inference. (3) The 6th has all three appearing-objects, and thus, this consciousness possesses the ability of inference, while its perception is basically delusive.

On these bases, it is known that the obstacles to enlightenment mainly come from the 6th and the 7th consciousnesses. Therefore, the nature of enlightenment is actually to remove the obstacles from these two consciousnesses. This will be mentioned in detail in Chapter 9.

2. The Functioning-Structure of King-Mind *Alayavijnana*: Hierarchy III

The king-mind is also called the power-mind, controlling-mind and directive-mind. It is here necessary to emphasize that, in a broad sense, the king-mind is the major subjective mental part of the mind governing action with and in response to objective objects. By these different names, we can see that the king-mind possesses a unique, sole characteristic capability, which is automatic, discriminating, controlling, and directive. No other universal-things possesses such a capability, which is a great power. In this Buddhist theory, all great physical powers, such as sun energy or atomic energy is transformed from this power. This power needs a relatively long period of objective development, through a process of karma-force.

It is now to briefly describe: how this powerful mind is differentiated into eight different faculty- / functioning-structures or eight consciousnesses; and how their powerful functions are expressed. Although Figs. 3-4 and 3-5 classify eight consciousnesses into three hierarchies, in this theory, all of them are in convenience called consciousness. Now, they are described in the order of differentiation as follows .

The name and meaning of the eighth-consciousness *or Alayavijnana*, according to *The Doctrine of Mere-Consciousness*, is defined as follows (Wei, tr., 1973, p.105):

The first consciousness capable of transformation and manifestation is, in the Mahayana and Hinayana teachings alike, termed the Alaya-vijnana or the Alaya consciousness. The name of this consciousness has three meanings:

1. It is actively *alaya*, storehouse, because it plays the active part of storing up the Bijas (seeds) which, being stored, are passively *alaya*.
2. It is passively *alaya* in the sense that it is 'perfumed ' by the defiling dharmas of *samklesa*. [These dharmas create in it the Bijas which make of it a storehouse and store themselves in it.]
3. It is the object of attachment. Manas attaches itself to it as to its Atman. In other words: The Alayavijnana and the defiling dharmas of *samklesa* are the cause of one

another; Sentient beings hold on to the Alayavijnana and imagine that it is their inner self.

According to Figs. 3-4 and 3-5 mentioned above, the 8th-consciousness /*alayavijnana* (equivalent to Tai-Ji) is the product of the first division / differentiation / actualization from the true- / pure-mind (or self-nature / *bhutatathata*, equivalent to Wu-Ji); and according to Fig.3-8, it divides into two, *darsanabhaga* and *nimittabhaga*. The former is the root of false-mind / life in the pheno-world; and therefore, it can be further differentiated into seven other consciousnesses (i.e. the 7th, the 6th, and the first five), and certain numbers of mind-faculties / -associates. The latter is the physical-world, including the physical-bodies of relevant sentient-beings.

It is very interesting to note that all sentient-beings, including ourself, actually live not only in their (our) own *darsanabhaga* (subjective world), but also in their (our) own *nimittabhaga* (objective world). However, very few know this due to five basic bad things, i.e. the one state of ignorance, the two adhesions, and the two barriers.

What are the relationships between *darsanabhaga* and *nimittabhaga* and that of among the 8th-consciousness and other seven consciousnesses ? *Darsanabhaga* (subjective-perceiving-division) is the directive center of the 8th-consciousness, which possesses automatic and dynamic power. It does not directly interact with the outside objective world, and mediates through the other seven consciousnesses in an orderly fashion. The subjective basis of dependence / *asraya* of this consciousness is true- / pure-mind, and its direct perceiving-object / *alambana* is the 7th-consciousness.

The capability of karma-seed storage is a very important functioning characteristic of this consciousness. Another is the nature of continuity. Because this consciousness is directly dependent on true- / pure-mind, which is eternal and continuous, the direct-transformation-/ first-actualization-product, the 8th-consciousness, keeps the continuity characteristic of the true- / pure-mind.

Therefore, the 8th- / karma-seed-storage-consciousness is the root of pheno-life. The physical-body of pheno-life contains the phenomenal expression of birth and death. Life is divided into different life-times, the past, the present and the future (called three life-times), expressed in the phenomenon of discontinuity. However, the 8th-consciousness is continuous, as is the true- / pure-mind. Karma-seeds possess the characteristic of creation (beginning) and annihilation (ending), and they can act across three life-times and not be limited to the present life-time.

After human death, the activities of the first seven consciousnesses are stopped and transformed into the 8th-consciousness. The 8th-consciousness continues to exist in an intermediate type, called the intermediate-shade(or negative)-body. This type of life-stage is only the 8th-consciousness itself without a physical-body, and can be called a naked 8th-consciousness. It may be existed in certain kinds of energy-waves determined by the nature of karma-seeds stored within it. Because the capabilities of human sense are limited to a small range of energy-waves, those of the intermediate-shade-body of the 8th-consciousness are beyond the range of our senses. According to Buddhist practice and proof, once one's sense capabilities are changed and enlarged, in enlightenment, one's senses can then feel it directly and clearly.

In this theoretical view, fertilization means the entrance of the intermediate-shade-body of the 8th-consciousness into an egg; and under the stimulation of its power and according to its stored karma-seed information, the development of a new physical-body follows, and a new period of life-time starts. Simultaneously, during this process, the 8th-consciousness gradually, systematically, and exactly redifferentiates the other seven new consciousnesses.

3. The Functioning-Structure of King-Mind *Klistamanovijnana*: Hierarchy II

The seventh-consciousness / *klistamanovijnana* is the consciousness of cogitation.

According to *The Doctrine of Mere-Consciousness* (ibid, p.251):

In the sacred teachings, this consciousness is given the special name of *manas*, because in its perpetual practice of cogitation it surpasses the other consciousnesses. The name of *manas* is formed in accordance with the rule of composition called 'Karmadharaya'; it means: 'consciousness that is *Manas*', ... the name of *Manavijnana* is formed by the rule of composition called 'Tatpuruṣa', which indicates the idea of lordship or possession. Accordingly, *Manovijnana* means 'consciousness of *Manas*', or 'consciousness of the mind', the sixth consciousness being different from *Manas*.

This consciousness is differentiated from the 8th-consciousness / *alayavijnana*, so the latter is the root or the basis of dependence / *asraya* of the former. The perceiving-object / *alambana* of this consciousness is of two directions: one is outer, the *nimittabhaga* of the 6th-consciousness; and the other is inner, the *darsanabhaga* of the 8th-consciousness. This position determines the two key actions / functionings of this consciousness.

(1) In the inner direction, this consciousness delusively attaches the *darsanabhaga* of the 8th-consciousness as if it were the real self (ego) / *atman*. Due to this type of ignorance, it forms two of the four roots of birth and death, the *atman* -adhesion / *atmagraha* and the vexing-passion-barrier / *klesavarana*.

(2) In the outer direction, this consciousness delusively cogitates, discriminates, and attaches the outside objective world as if it were true and separate from self as a different thing. It does not know that it is the *nimittabhaga* of its own *alayavijnana*, transformed from its own karma-forces / -seeds stored within it. Due to this error, the formation of the other two of the

four roots of reincarnation is caused, that of dharma-adhesion / *dharmagraha* and of the *mahabodhi* -barrier (barrier of the known) / *jneyavarana*.

The 7th-consciousness / *klistamanovijnana* continuously and perpetually cogitates without disruption during the period of a life-time. It differs from the 6th-consciousness, which does not cogitate continuously and sometimes has disruptions. After death, this consciousness, unlike the 8th but like the 6th, is also discontinued, with its energy transformed back to the 8th. It can not be across the three periods of life.

In the beginning of each life, i.e. after fertilization and the start of embryonic development, this consciousness is redifferentiated from the 8th. It is the first to be redifferentiated, of the seven discontinued ones after death. After redifferentiation, the 7th again attaches to the *darsanabhaga* of the 8th as real ego / atman. Hence, the 7th also acts a very important rule, accompanying with the 8th, during the embryonic development of the physical-body.

4. The Functioning-Structure of King-Mind First-Six-Consciousnesses: Hierarchy I

4.1 The Nomenclature of the Six Consciousnesses

Because the six consciousnesses have a common function to perceive and distinguish external six-objects / -dusts, they are put together for one same hierarchy. From another point of view to consider them as the same hierarchy I, because they also have the common characteristic of directly interacting with the external six-objects / -dusts, in different degrees.

According to *The Doctrine of Mere-Consciousness* (ibid, p.343):

These six categories of consciousness are classified in accordance with the six sense-organs (*indriyas*) and their respective spheres of objects (*visayas*). They are known as the visual consciousness (*caksurvijnana*) and so on down to the sense-centre consciousness (*manovijnana*). [Thus the consciousnesses which distinguish by the senses the objects of the external world are of six varieties: the five senses (sight, hearing, smell, taste, and touch), plus a sixth faculty, the sense-centre consciousness, which unifies and coordinates the percepts derived from the five senses.]

The name of each of these consciousnesses is established by reason of the organ to which it related, not by reason of the particular object perceived by it. This is because each organ has five values: 1. The consciousness depends on the organ for support (*asraya*); 2. the consciousness is conditioned by the condition of the organ; 3. the Bijas of the consciousness depend on the organ; 4. the consciousness assists the organ; and 5. the consciousness bears a resemblance to the organ.

The designation of the six consciousnesses can also be named in accordance with the objects perceived by them. However, because this way of nomenclature has some limitations, i.e. the functions of perceiving objects are interchangeable during the attainment of certain stages of practice, they are generally named in accordance with the name of the sense-organs. Reasons concerning this are discussed in *The Doctrine of Mere-Consciousness* (pp.343-344):

The six consciousnesses are also named in accordance with the objects perceived by them: consciousness of *rupas* (*rupavijnana*) and so on down to the consciousness of dharmas (*dharmavijnana*). This definition conforms to the meaning of the word consciousness or *vijnana*, that is, the perception of the six objects. The first five --*rupa*-consciousness, sound-consciousness, etc. -- perceive respectively *rupa* (colors and forms), sound, etc. The sixth, dharma-consciousness, perceives all dharmas (*rupa* etc.); or else it perceives that which, in a special sense, is dharmas, that is, the *dharmayatana*. This is why it receives the name of dharma-consciousness (*dharmavijnana*).

The designation of the six consciousness in accordance with the objects perceived by them hold good as long as we considering the state in which mastery of the five material sense-organs has not yet been perfect. When mastery has been achieved (after the first stage of Self-realization, according to some schools; or the state of Buddhahood, according to others) the activity of the sense-organs is interchangeable. In other words, the sense-organs can exchange their functions: the consciousness produce by one organ, no matter which, can reach and perceive all objects of the senses. In this case, we can no longer designate the consciousnesses in accordance with the objects perceived by them; in order to avoid confusion, we can only name them in accordance with the organs through which they manifest themselves.

4.2 The Sixth-Consciousness or *Manovijnana*

Of the six consciousnesses, the 6th is the most important, because it is their center. It is dependent on the root of the 7th / *manas*. In the system discussed above, naming it in accordance with the name of its root, the 6th can also be called *manovijnana*. The perceiving-objects / *asraya* of this consciousness are the broadest of all the eight consciousnesses. The 6th perceives all dharmas including every five macro-objects / dusts, as perceived by the five first consciousnesses, as well as the other five micro-dharmas / dusts. These latter are beyond the perceiving capability of the first five consciousnesses and can only be perceived by the 6th.

According to the different types of action, the 6th / *manovijnana* can be divided into four different types:

(1) *Synchronistic-Conditioned-Manovijnana* refers to the 6th / *manovijnana* as it arises immediately and synchronistically with one of the first five consciousnesses and perceives the corresponding of the external five-object / dust. This belongs to the direct-appearing-object of this consciousness.

(2) *Accompanying-First-Five-Manovijnana* is the type that arises simultaneously accompanying with all of the five consciousnesses and perceives all of the objects / dusts (i.e. form and color, sound, smell, taste, and touch), and also perceives the other twelve-objects (the six-roots / sense-organs and their related consciousnesses). All of these objects with that other objects / dusts (dharmas), which are only perceived by the *manovijnana*, are called the eighteen-realms. This type of *manovijnana* can perceive almost everything in this pheno-world within the range of human sensation resolving-power / discriminative-ability. It possesses all of the three types of the appearing-objects, the direct, the indirect, and the false.

(3) *Post-Five-Manovijnana* means that, like the first synchronistic-conditioned one, this type of *manovijnana* arises synchronistically with one of the first five consciousnesses and perceives the same one of the external five objects / dusts, and that then this perceiving process can be continued. This *manovijnana* belongs to both indirect (comparative)- and false-appearing-objects.

(4) *Unique-Manovijnana* means that this type of *manovijnana* arises uniquely and alone and does not accompany of the first five consciousnesses. This *manovijnana* perceives all of the eighteen-realms, like the second one, mentioned above, and it always pertains to both the indirect (comparative)- and false-appearing-objects. There are three different types of this *manovijnana*, described as follows.

(i) *Separating-Unique-Manovijnana* is a general unique-*manovijnana*, which arises uniquely and alone separate from the first five consciousnesses and from the present external five-objects/dusts. Thus, it only perceives the past and future dharmas / things, the present micro-dharmas (the sixth category of dharmas only capable to be perceived by the *manovijnana* immediately above), and delusive images like flowers in the sky and the moon in the water.

(ii) *Within-Dreaming-Unique-Manovijnana* holds that this *manovijnana* can work without accompanying with any of the first five consciousnesses and perceiving any of the external five-objects / dusts. However, the image is not as clear as that which appears in the action of the separating-unique-*manovijnana*.

(iii) *Within-Meditation-Unique-Manovijnana* describes the *manovijnana* that arises uniquely and solely during meditation, and that the other five consciousnesses are not completely manifested in the meantime. This occurs generally in the beginning stage of

meditation practice. After the first stage of enlightenment in Zen meditation practice, this *manovijnana* is transformed into the profound-observing-wisdom. This will be further discussed in the chapter concerning Zen.

According to this theory of the classifications of the 6th-consciousness / *manovijnana*, philosophical, mathematical, and theoretical scientific considerations, especially those of theoretical quantum physics, belong mainly to the action of the latter two types of the 6th / *manovijnana*, the post-five-*manovijnana* and the separating-unique-*manovijnana*. On this basis, philosophers and theoretical scientists must first attain enlightenment and transform their *manovijnana* into profound-observing-wisdom, then they can take philosophy, mathematics, physics, and biology to greater breakthroughs and progresses.

4.3 The First Five Consciousnesses

The first five consciousnesses / *vijñanas* are: the eye (sight) / *cakṣur-v.*, the ear (hearing) / *śrotra-v.*, the nose (smelling) / *ghrāṇa-v.*, the tongue (tasting) / *jihva-v.*, and the body (touching) / *kāya-v.* They are put together, according to *The Doctrine of Mere-Consciousness* (p.479), because:

‘ The five consciousness’ refer to the first five evolving consciousnesses, i.e., visual consciousness etc., which, being similar in category, are spoken of together. [In fact, they all depend for support on material organs; they all perceive material and actual objects in an immediate manner; and they are all subject to interruption.]

The roots / dependent-sense-organs of the first five consciousnesses are the internal five roots / sense-organs: eyes, ears, nose, tongue, and body. These are the physical roots, and the 6th-consciousness is the common mental root of each of the first five consciousnesses. Therefore, the five can not arise and act alone without the company of the 6th together. However, sometimes, the 6th, i.e. the unique-*manovijnana*, can do it, as described above.

In human-beings, each of the first five consciousnesses only understands and discriminates its corresponding external objects / dusts, and these functions are not interchangeable with each other. In layman, the mastery of the five material sense-organs has not yet been perfected. However, according to *The Doctrine of Mere-Consciousness* (p.345):

When mastery has been achieved (after the first stage of self-realization, according to some School; or in the state of Buddhahood, according to the others) the activity of the sense-organs is interchangeable. In other words, the sense-organs can interchange their functions; the consciousness produced by one organ, no matter which, can reach and perceive all objects of the senses.

After meditation practice and enlightenment, when the first five consciousnesses have been transformed into the perfect-acting-wisdom, the functions of the five sense-organs become inter-changeable. This interesting problem is valuable for exploration by modern human physiology, neuroscience, and psychology.

4.4 Interrelationship and Wholeness of Eight Consciousnesses with True-Mind

The differentiation process and sequencing of the eight consciousnesses has been described above, and the interrelationship and the system of the wholeness of the eight consciousnesses are emphasized here. From the viewpoint of this theory, *the theory of dichotomic / twofold truths* (see Chapter 1) and *the theory of bhutatathata and nirvana* (see Chapter 7), while there exist eight consciousnesses, they all belong to the differentiation, utilization and transformation of the true- / pure-mind, self-nature, or *bhutatahata*. Therefore, the eight consciousnesses are actually a whole system, in close interaction, dependent on each other, and can not be separated. It may be said:

The eight are one; and one is eight.

The interrelationships and the wholeness system of the eight consciousnesses with true-mind can be shown in Fig. 13.

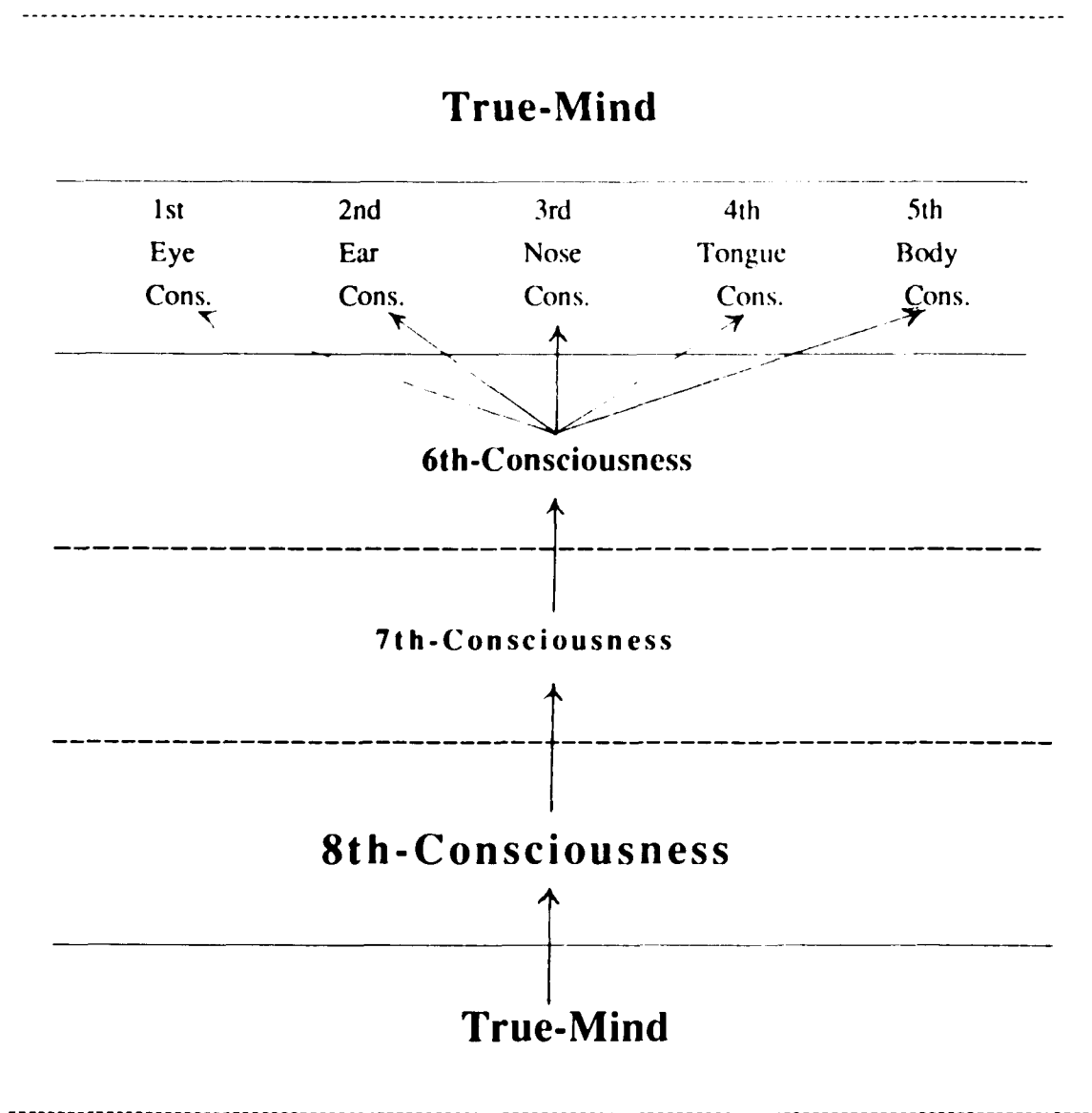


Fig. 13 Interrelationships and the Holistic System of the Eight Consciousnesses with True-Mind (The broken lines mean without border-line)

Chapter 4 Theory of Karma-Seed (*Bija*) and the Retribution of Life

I. Introduction and Definitions

In the last chapter, *the theory of wei-consciousness*, it was stated that the Buddhist concept of mind is composed of eight consciousnesses, and that all things in the universe, animate and inanimate, mental or subjective and physical or objective, are merely different hierarchical expressions and transformations of these different consciousnesses.

Now, a question arises how consciousnesses express and transform into all things in the universe. This question is dealt with by stating that there are three steps:

(1) One's consciousnesses interact with certain external conditions and transform into karma-forces or unmatured karma-seeds / *bijas*.

(2) They are then stored in the 8th-consciousness developing for maturation.

(3) After a certain period of development, under the stimulation, catalysis, or a process of actualization by definite external conditions, the karma-seeds / *bijas* mature and are expressed subjectively as the personal physical body and psycho-activities (formed by individual-special-karma-seeds), and objectively as the individual living conditions of the external world, which is shared with other living-beings (formed by interaction and accumulation of group-common-karma-seeds).

Although the creation of karma-force / karma-seed requires the stimulation and influence of external conditions, the subjective internal potential power of the mind / consciousnesses belongs to free will. After the creation of karma-force / seed by free will, the process of development, maturation, actualization and retribution is controlled by the objective *law of cause and effect*. The details are mentioned as below.

1. The Definition of Karma-Force / Karma-Seed (*Bija*)

The word *karma* is from Sanskrit and its original meaning is an action, or more exactly a volitional action. Since it is known that producing an action needs a force or a power, it may be said that *karma* is a force or a power (Chang, 1973, p.75) and generally also called as karma-force. The word *bija* is also from Sanskrit and its meaning is seed. Because a kind of karma-force is first kept in an unmatured form like a dormant seed, it can also be called a karma-seed or *bija*. Simply, sometimes, it is called karma, seed, or *bija*.

It is further defined as follows:

A karma-seed /bija is a potential functional-unit, which is created by different types of mental activities, transformed from mind-force, and stored in the 8th-consciousness / alayavijnana. After a period of development accompanied by certain conditions, it bears a corresponding fruit, effect or retribution. A bija is also a relatively continuous existing-entity or a kind of force / power / energy, which once formed continues to exist, and it never disappears if it is not expanded in retribution. It is conservative as in the modern understanding of the conservation of energy in physics. Thus, a bija can be also said as an energetic-functional-unit like a universal-germ / gene of both the animate and inanimate, the mental and physical.

According to *the Doctrine of Mere-Consciousness* (Wei, tr., 1973, p.109):

1. *What kind of dharma is called Bija ?* The Bija are the different potentialities which are found in the Mulavijnana, root-consciousness, i.e., the Alayavijnana, and which immediately engender their fruit, that is to say, the actual dharmas (i.e., dharmas in activity).

2. *Reality of the Bijas:* The Bijas, in relation to the root-consciousness and the fruit, are neither identical nor different. Such is, in reality, the mode of relation between the substance (*svabhava*), consciousness, and the activity (*karitra*), Bija; between the cause (*hetu*), Bija, and the fruit (*phala*), actual dharma.

In the *Doctrine of Mere-Consciousness* (pp.127-129), it is further stated that the karma-seed /*bija* possesses six characteristics with conditions which have to be satisfied.

(1) The Bijas are momentary, *ksanika*.--- Only those dharmas can be Bijas which perish immediately they are born and which possess a superior power of activity. This excludes the eternal dharmas which, being changeless and immutable, are incapable of generative action.

(2) The Bijas are simultaneous with their fruit. --- Only that dharma is a Bija which is simultaneously and actually connected with its fruit (that is, with the actual dharma which it engenders). This excludes those dharmas which are anterior to their fruits and those which are not related with their fruits.

(3) The Bijas form a continuous series. --- They must, for a long period of time, continue in a homogeneous and uninterrupted series until the final stage, i.e., until the moment when the Holy Path is attained which will counteract and thwart them. This definition rules out the doctrine that the first seven consciousnesses (*thepravrttivijnana*) are Bijas. This definition shows that similar Bijas engender one another in succession.

(4) The Bijas must belong to a definite moral species. --- They must possess the capacity to engender actual dharmas, good, bad, non-defined: this capacity is determined by the cause of the Bijas, i.e., the actual dharmas, good, bad, non-defined, which have performed and created them. This definition rules out the Sarvastivadin doctrine that a cause of a certain species (good etc.) can engender, 'qua similar cause', a fruit of another species.

(5) The Bijas depend on a group of conditions. --- To realize their capacity to produce an actual dharma, the Bijas require a concurrence of conditions. This definition shows that, since the conditions are not always present, the Bija does not produce its fruit at all times and all at once.

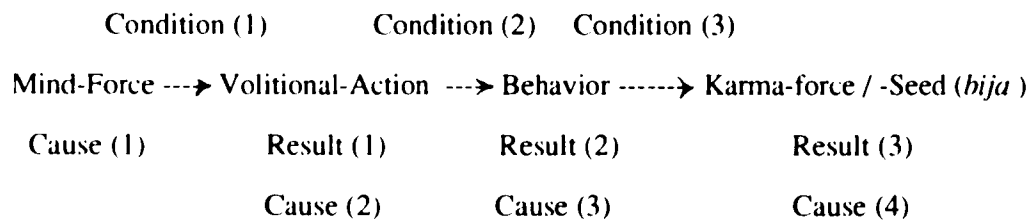
(6) The Bijas 'lead' to their own fruit. --- Each Bija leads to the production of its own fruit: a Bija of mind (*citta*) leads to the manifestation of mind, a Bija of Rupa, to the production of Rupa. This definition rules out the theory held by the Tirthikas of a unique cause engendering all fruits. It rules out the theory of the Sarvastivadins etc., according to which Citta and Rupa are reciprocally 'condition qua cause' (*hetupratyaya*)

According to the law of cause and effect, the karma-force / karma-seed (*bija*) is cause, and its retribution through maturation are effects. This process are controlled by this law.

2. The Definition of Retribution

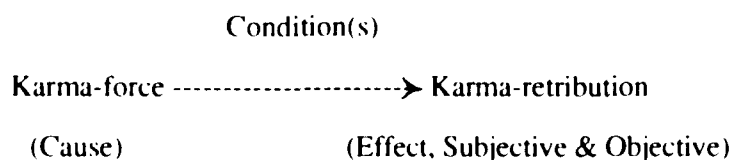
means that the karma-force / karma-seed (bija), i.e. the cause, under the stimulation and catalysis of certain external conditions, comes into maturation, actualization, and manifestation, and is then transformed into effect / result, i.e. the subjective world (the physical-body and the mental-elements) or the objective world (the physical and social environments).

There is an order to this process: from the force or power of the mind producing a volitional action, and then a volitional action producing a behavior. This can be formulated in the following formula:



According to *the law of cause and effect* and *the theory of conditioned-arising*, in the above formula, mind-force, volitional-action, behavior, and karma-force / -seed (*bija*) can be all dealt with both as a cause and effect, reciprocally, and each step needs a condition. But only mind-force is expressed directly from pure-mind, can it be thought to be a “first cause”.

However, we mainly consider the starting of karma-force as a cause to be influenced by certain kind of condition(s). This cause produces a certain kind of result / effect, which is then called "retribution" or "karma-retribution"; and another formula can be given as follows:



For easier consideration, later on, the term karma or seed (*bija*) will represent karma-force / karma-seed / *-bija* (cause), with the term retribution representing karma-retribution (effect).

3. The Definition of the Theory of Karma-Force and Retribution

The terms karma-force / karma-seed (*bija*) and retribution have been defined separately; and now, *the theory of karma-force / karma-seed (bija) and retribution* needs to be further defined as follows:

All living-beings and their living-worlds are retributions which are transformed from karma-forces / karma-seeds (bijas), and these karma-forces / karma-seeds are firstly transformed from the mind-force through both mental and physical activities of the living-beings interacted with certain kind of conditions and are stored in one's own 8th-consciousness / alayavijnana controlled by the law of cause and effect while they are after a certain period of development and catalyzed / fumigated, actualized, retributed, and expressed into effects / results, both subjective world and objective world.

This theory is similar to *the theory of the integration of cause and condition*; and the basic principle of corresponding reaction is really the same for both of them. The main emphasis, however, of the earlier theory is on its basic common nature and universality. This theory is more concrete and emphasizes both moral characteristics and life formation /

transmigration. Karma-force is actually the dynamics of *the law of cause and effect*.

According to Newton's third law, every action of force always produces an opposite reaction with a same magnitude, and such a reaction may be called a "work". Karma-force may be said to be, in some extent, equivalent to Newton's physical-force; and retribution may be seen as equivalent to Newton's "work." The major difference is that the Buddhist ideas of karma-force and retribution belong mainly to the mental and moral domain while Newton's idea of force belongs to the physical.

Modern physics has proved the conservation of energy; and karma-force, in Buddhism, is also completely conservative. While one's physical body has to die, without exception, its related karma-force is never eliminated and is continuous through the past, present, and future. It can be transformed into various kinds of retribution, but the energy itself remains unchangeable.

Thus, this is a very important rule that:

Karma-force can never be eliminated, but can only be transformed.

According to this theory, all universal things are phenotypically in changing:

Production ---➤ Temporary-maintaining ---➤ Destruction

These changes are nothing other than the transformation of karma-forces. Although forms of karma-forces are always changing, the karma-force itself is never changed. More exactly, karma-force is transformed from true-mind-force, and the true-mind-force has an absolute existence. This theory concretizes *the theory of conditioned arising, the theory of wei-consciousness, and the law of cause and effect*, mentioned in Chapters 1 and 3.

II. The Origin, Classification and Interaction

1. The Origin and Nature of Karma-Force / *Bija*

1.1 The Origin of Karma-Force / *Bija*

Karma has been defined earlier as a force or a power, and a question arises concerning its origin. In Buddhism, basic karma is thought to originate from the mind, because the mind has a special kind of force and karma-force is actually transformed from mind-force. Although both karma-force and mind-force have no form, shape, mass or weight, they exist in action, just as different kinds of physical force and energy, which from a Buddhist viewpoint also belong to karma-force. Therefore, from moment to moment and from time to time, the mind, if not enlighten, always stays in action continuously. Mind-force is transferred into karma-force in all moments and never stops.

1.2 The Nature of Karma-Force / *Bija*

The most important point about the nature both of mind-force and karma-force is that they are always conserved and never eliminated. They can only be transformed in nature and form, just like physical force and energy.

Karma is thus called "seed", which is continuously stored in the 8th consciousness. The difference between the mind and the eight consciousnesses will be considered in the next section. The nature of conservation is a basic feature of karma-force. There are also three other aspects of nature, namely, the good (*kushala*), the bad (*akushala*), and the neutral (*avyakṛta*). These belong to the domain of morality and are the bases for Buddhist ethics and teaching.

2. Classification of the Kinds of Karma-Forces / *Bijas*

2.1 Classification according to Their Origin

2.1.1 According to the *Abhidharma Kosa Sastra*

In the *Abhidharma Kosa Sastra* , there are three kinds of karma-forces / *bijas* to be divided according to their origins:

Thinking is the karma of thought or thought-karma, and the actions of body and speech are the karma of deed or deed-karma and the karma of word or word-karma, respectively.

These are three basic karmas, that of thought is the most basic and important. On the basis of these three kinds of karmas, that of thought and deed is further divided into three, and that of the word is further divided into four, for a total of ten.

2.1.2 According to the *Doctrine of Mere-Consciousness*

According to origin, in the *Doctrine of Mere-Consciousness* (ibid, p.117), two basic kinds of karma-forces /*bijas*: are divided: the natural or inborn and the newly-energized or acquired.

1. Natural or inborn *Bijas*: these refer to the potentialities which have innately existed since before the beginning of time in the *Vipakavijnana (Alayavijnana)* by the natural force of things (*dharmata*) and which engender *Skandha-ayatana-dhatu*s.

2. *Bijas* whose existence has had a beginning: These *Bijas* have come into being as a result of perfuming (*vasana*) by actual *dharma*s which has been repeated and repeated since before the beginning of time.

According to this theory, all things / dharmas arise from the integration of both kinds of *bijas*, except the pure-wisdom arising from the inborn-*bija*, occurring at the instantaneous moment of enlightenment. There are three basic times of enlightenment for a layman evolving into a Buddha; and four basic types of perfect wisdom transformed from eight consciousnesses or arising from the inborn-*bija*.

These three times are: first, the profound-observing-wisdom, transformed from the 6th-consciousness; second, the universal-equal-wisdom, transformed from the 7th-consciousness; and last, in attaining Buddhahood, the perfecting-action-wisdom, transformed from the first five consciousnesses, and the great-mirror-wisdom, transformed from the 8th-consciousness. From this point of view, the name “karma-seed” or “*bija*” belongs to a newly actualized, energized, or formed *bija*.

2.2 Classification according to Their Nature

According to its nature, a *bija* can be classified in two ways: (1) the classification of the delusive / *asrava-bija* and the enlightened / *anasrava-bija*; (2) the classification of the good, the bad, and the neutral.

2.2.1 The Delusive / *Asrava-Bijas*

These *bijas* belong to a delusive group and produce the fruits of vexations and barriers. They possess potential karma-forces / -powers, which cause sentient-beings to exist in the three-realm of suffering and the six-ways of transmigration, as mentioned earlier.

This kind of *bijas* can be further divided into two types: the *nisyanda-bija* / equal-cause-effect-seed and the *vipaka-bija* / different-retribution-seed.

(1) *The Nisyanda-Bija / Equal Cause-Effect-Seed* holds that this *bija* can produce the effect / fruit which will possess the same nature as its *bija* (the good *bija* produces the good effect / fruit, and the bad *bija* produces the bad effect / fruit). It also means that this kind of *bija* is produced by stabilizing the good, bad, and neutral manifest-activities of the 7th-consciousness. It also can manifest the condition-qua-cause / *hetupratyaya* of the three qualities of dharmas / things (the good, bad, and neutral) of the 8th-consciousness.

(2) *The Vipaka-Bija / Heterogeneous-Seed* holds that this *bija* can produce the neutral-fruit of both common and individual retributions, and that this kind of *bija* can manifest the condition-qua-contributory / *adhipatipratyaya* of the production of the *vipaka-phala* /heterogeneous-fruit. This kind of *bija* is produced by stabilizing the good, bad, and neutral manifest-activities of the first six consciousnesses.

2.2.2 The Enlightened /*Anasrava-Bijas*

These *bijas* do not possess vexations or barriers and are causes in the process of enlightenment and evolution to the stages of Bodhisattvahood and Buddhahood. It can be divided into two kinds: (1) the *atman-sunya-anasrava-bija* that is the *bija* of the annihilation and emptiness of the *atmagraha* and the *klesavarana* and (2) the *dharma-sunya-anasrava-bija* that is the *bija* of the annihilation and emptiness of the *dharmagraha* and the *jneyavarana*.

According to this theory, interactions exist between these two *bijas*. The *nisyanda-bijas* actually can not manifest activities of the good or the bad. They must interact with the *vipaka-bijas*, i.e. the *adhipatipratyaya* manifested by them. Then they can be manifested in the form of *vipaka-phala*, which consists of a mixture of the good and the bad *nisyanda-bijas* transformed into a state of neutral-nature. It is interesting to note that only a mixture of good and bad *nisyanda-bijas* can demonstrate the form of *vipaka-phala*, i.e. our physical-body and

the pheno-world. This neutral *vipaka-phala* can manifest good and bad effects under different times and conditions, because it is composed of good and bad *bijas*.

2.2.3 The Good-, Bad- and Neutral-Karmas

According to their effective nature, karma-seeds / *bijas* can be classified into good, bad, and neutral (neither good nor bad) types. However, generally only two of them, good and bad, are emphasized. Because all three basic kinds of karmas, according to the classification of their origin, possess two types of effective nature (the good and the bad), therefore, there are a total of twenty different karmas. Generally, they are called the ten-good-karmas and the ten-bad-karmas, shown in Table 11.

Table 11 Classification of Different Karmas according to both of Nature and Origination

Good			Bad			Total
Deed	Word	Thought	Deed	Word	Thought	
3	4	3	3	4	3	20

2.3 Classification according to Their Relationships

From the viewpoint of relationships, karmas can also be divided by other two categories: the particular or differentiated and the general or common. Particular karma is created by every individual, and general karma is a sum of karmas which are created by all related individuals.

2.4 Classification according to Their Ripening Time

From the viewpoint of ripening-time, karmas can be again divided into: two categories, i.e. the decided and the undecided; and four kinds, i.e. (1) the present-life-time ripening, (2) the next-life-time ripening, (3) the next--life-time ripening, and (4) undecided ripening.

These kinds of karmas / *bijas* can be shown in Fig. 14.

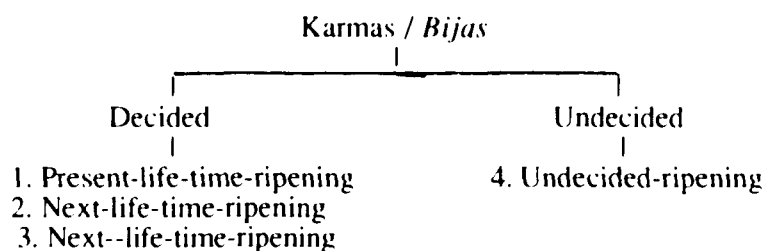


Fig. 14 Classification of Karmas / *Bijas* according to Ripening Time

2.5 Synthesis of Different Classifications

2.5.1 Synthesis of Classifications according to Nature and Origin

There are many different kinds of karma-seeds / *bijas* and also many different classifications according to their different nature and origins. Here is a general brief classification, as shown in Fig. 15.

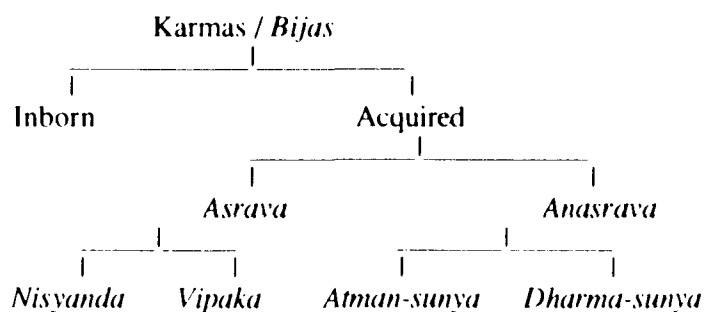


Fig. 15 The Classification of Karma-Seeds / *Bijas*

2.5.2 Synthesis of Four Different Classifications

Now all four different classifications, i.e. (1) according to origin, (2) according to nature, (3) according to relationships, and (4) according to ripening time, can be synthesized in Fig. 16.

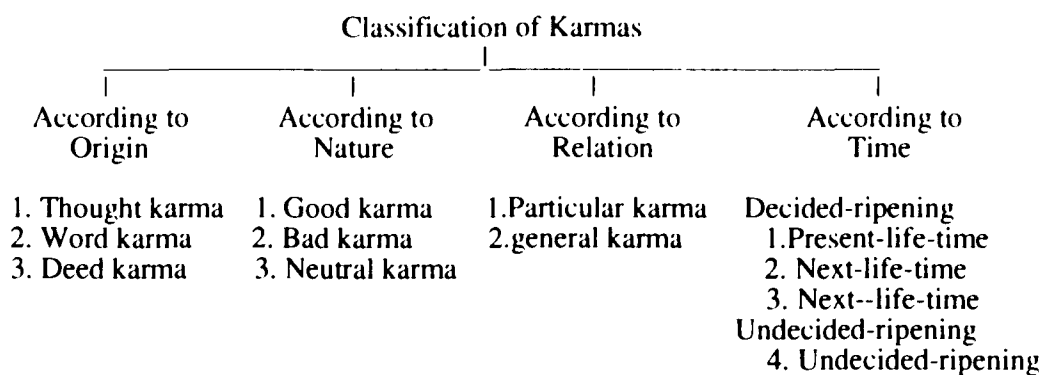


Fig. 16 Synthesis of Four Different Classifications of Karma-Seeds / *Bijas*

3. The Nature and Classification of Retribution

Due to the three kinds of nature in karmas, there are also three corresponding kinds of nature in retribution, namely, the good or pleasant, the bad or unpleasant, and the neutral or undefinable. It is a strict rule that good karma always only produces good merit and pleasant retribution, bad karma always only produces bad merit or demerit and unpleasant or painful retribution, and neutral karma always produces neutral retribution, i.e. neither pleasant nor painful. It is impossible for one to produce the opposite one.

On the other hand, from the viewpoint of origin, the retribution can be divided into two categories: the direct retribution of the individual's previous particular karmas, such as being born as a man; and the indirect or dependent retribution of the individual's previous general karma, i.e. the dependent conditions or environments, such as family, country, world, and universe, etc. Dependent retribution can be divided into many different hierarchies.

The other classifications of retribution are basically the same as that for effect or fruit mentioned before.

4. The Interaction of Karma-Forces

How karma-forces work and how can the different kinds of karma-forces, the good and the bad, interact each other? According to Spiro (1970), there are three theories: the independent, semi-independent, and interactable.

4.1 The Independent Theory

It holds that the different nature of karma-forces can not interact with each other, and that good and bad karmas only act individually and independently, as shown in Fig. 17.

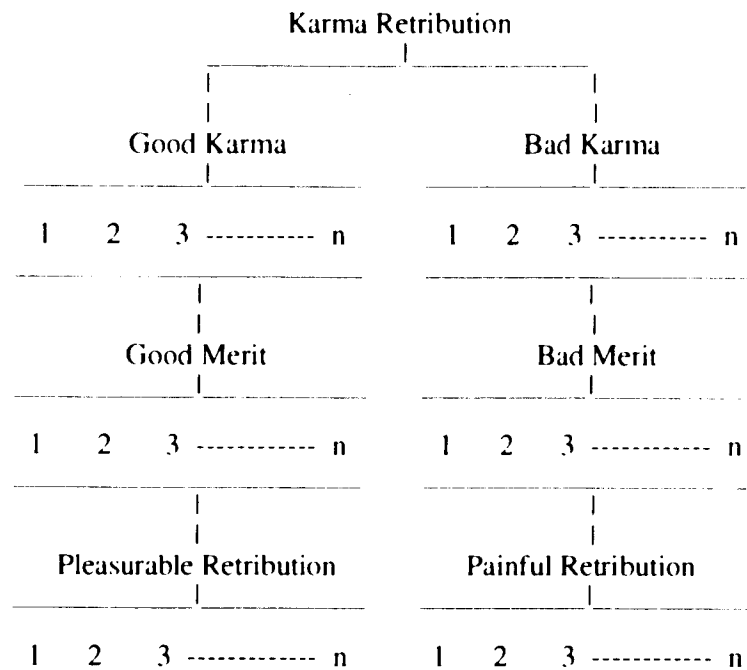


Fig. 17 Independent Retribution of Different Nature of Individual Karma-Force

According to this theory, *the law of cause and effect* works for each karma event independently, and the different kinds of karma-forces do not interact or influence each other. Namely, good karma-force can not neutralize bad ones, or vice versa. Thus, if a person has produced some bad karma, he can not neutralize them by doing more good karma. This is to say that although he will receive more pleasurable retribution, he will still receive the amount of painful retribution which responds to his bad karma.

4.2 The Semi-Independent Theory

Here, the same nature of different individual karma-forces are thought of as interacting with each other, not only the good and good but also the bad and bad can additively interact between different individual karma-forces, respectively. This situation is shown in Fig. 18.

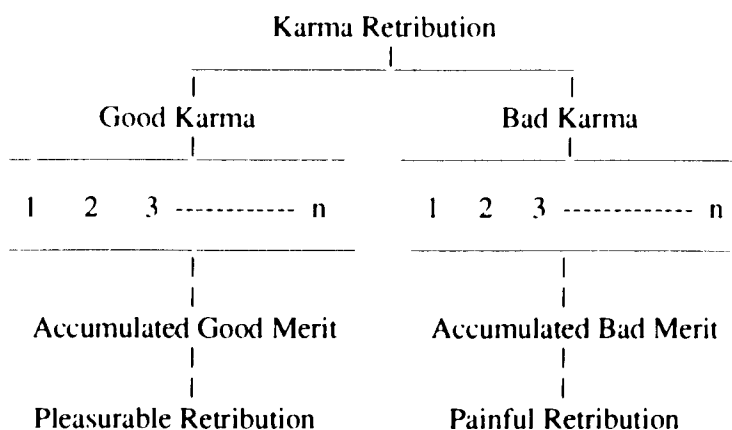


Fig. 18 The Semi-interaction of Karmas in Development for Retribution

The rules for this situation are basically the same as for the first one, in which the different natures of accumulated merits or demerits are without interaction.

4.3 The Interaction Theory

It means that the different nature of karma-forces can interact each other, that is to say that bad karma or bad merit can be neutralized by the good one. This situation can be shown in Fig.19.

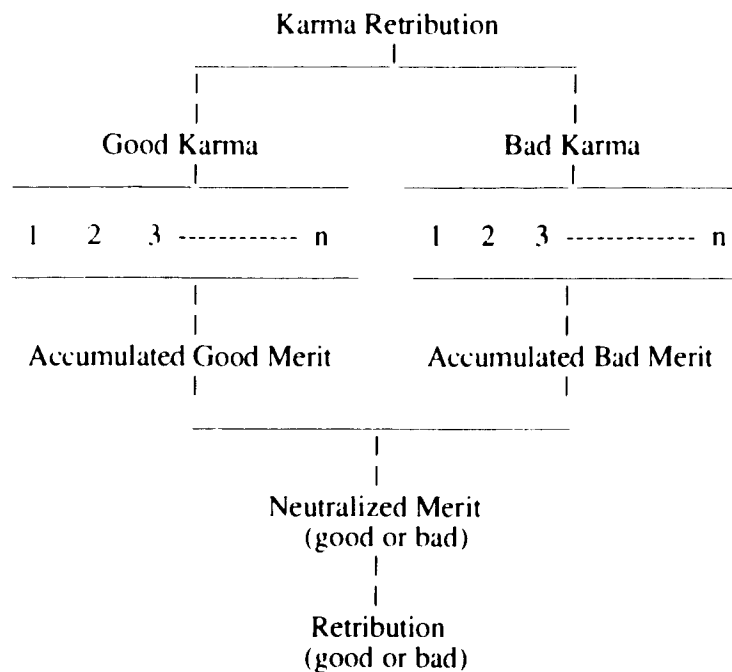


Fig. 19 Interaction of Different Karma-Forces in Development to Merit and Retribution

In the above figure, two things need to be further explained: (1) Interaction may also occur before the accumulation of the same nature of karmas, that is to say that the different natures of individual karma-forces can interact directly, making the accumulation of each different karma-force unnecessary. (2) The final expression of the nature of retribution will be determined by the nature of the remained net merit, or by the magnitude of the relative total amount of both karma-forces; that is to say if the total amount of good karma-forces is bigger than that of the bad one, then the final retribution is pleasant, and otherwise it is unpleasant.

According to Spiro (1970), the third theory seems more reasonable and more encouraging for most people in their self-cultivation.

III. Storage, Transmission and Expression of Karma-Seeds/*Bijas*

1. The Meaning of *Vasana*: Actualization / Energizing

The word “fumigation” is translated from Chinese, the original Sanskrit is *vasana*, which means smoking, influencing, promotion, catalysis, activation, actualization, or energizing. It is specifically used to explain how certain conditions influence, promote, catalyze, activate, actualize, or energize karma-seeds / *bijas* to produce / transform into activities or actual manifestations. This is a process, just as the fresh chicken to be smoked / cooked to become smoked / cooked chicken. The unsmoked / uncooked chicken is equivalent to the unmatured seed / *bija*, and the smoked / cooked chicken is equivalent to the matured seed / *bija* and its manifestations.

2. Relationships between *Bijas* and Eight Consciousnesses

2.1 Relationships between *Bijas* and the Eighth-Consciousness

Bijas are potential functional-units / unities, stored in the 8th-consciousness / *alayavijnana*. However, *bija* and *alayavijnana* are neither one or different things. They depend each other and can not be separated.

There are three types of relationships between them. (1) The *alayavijnana* is the body and the *bija* is its utilizing style. (2) The *bija* is cause and the *alayavijnana* is fruit. (3) The *alayavijnana* is a place, in which the inborn (old)-*bijas* are fumigated (*Vasana*) / catalyzed by the activities of the first seven consciousnesses and promoted the manifestation of their activities resulting in the production / transformation of the new-fumigating-seeds / acquired-

bijas. The *alayavijnana* is called the fumigate, i.e. the place which is fumigated: the first seven consciousnesses are called the fumigator, i.e. the dharmas which possess power to fumigate; and the new-fumigating-seeds / acquired-*bijas* are the products of fumigation. The meaning of *vasana* or fumigation will be explained latter.

According to the *Doctrine of Mere-Consciousness* (p.131), there are four characteristics of the actualized (perfumed)-place.

- (1) It is durable. That dharma is perfumable which, from beginning to end, is of one single species, continues in an uninterrupted series, and is capable of receiving and keeping the *vasana* or habit-energy. This definition rules out the first seven consciousnesses (*pravrttivijnana*) and their mental attributes (*caittas*), sound, wind, etc., which are not of a durable and permanent nature.
- (2) It is non-defined. That dharma is perfumable which is equal, which is not in contradiction (either with the good or with the bad), and which is capable receiving the habit-energy. This definition rules out that which is good and bad: being too intense and strong in its own quality for impressing or perfuming, the good or the bad is not capable of receiving the habit-energy.
- (3) It is perfumable. That dharma is perfumable which is autonomous, which is not as hard as stone, and which is capable of receiving the habit-energy. This definition rules out the mental associates (*caittas*) which depend on the mind (*citta*); it is also rules out the unconditioned dharmas (*asamskrtas*), (e.g., space), which, being unique and immutable, are not perfumable.
- (4) It is in intimate and harmonious relation with that which perfumes. That dharma is perfumable which is simultaneous with, and in the same place as, the perfumer, and which is neither identical with nor separate from the perfumer. This definition rules out the physical bodies of other persons and the anterior and posterior moments. These physical bodies and the moments, not being harmoniously related with the perfumer, are not perfumable.

Here, the “perfumable” means the capability to be actualized, and the “perfumer” means the ability to actualize the others. According to these four characteristics, it is therefore, only the 8th-consciousness or *alayavijnana* / *vipakavijnana* to be able for the actualized-place. Its five *caittas* and the first seven consciousnesses / *pravrttivijnana* do not qualify.

2.2 Relationships between *Bijas* and the First Seven Consciousnesses

Concerning the relationship between the *bijas* and the first seven consciousnesses, the first seven (exactly to say their perceiving activities) are the fumigator and the *bijas* or the new-fumigated-*bijas* are the fumigating-products. The first seven, the fumigator, are causes, and the *bijas* are fruits. However, things are dialectical, and from the other point of view, the first seven develop from the *bijas* stored in the 8th-consciousness. Thus, the first seven can be said as fruits, and therefore, the relationships of cause and effect / fruit are reciprocal.

However, not all activities of the first seven consciousnesses are fumigators, but they must have their own characteristics and there are four, according to *the Doctrine of Mere-Consciousness* (pp.131-132).

(1) The perfuming factor comes into existence and passes away (that is to say, it is born and perishes). That dharma perfumes which is not eternal, which is capable of activity, and which can create and nourish *Bijas* (i.e. habit-energy). This definition rules out those dharmas which are unconditioned, which are always identical, and which can neither create nor nourish.

(2) It is endowed with eminent activity. That dharma perfumes which is born and perishes, which possesses great creative power, and which is capable of producing the perfuming habit-energy (*vasana*). This definition rules out the eighth consciousness (the Vipaka-mind and its mental associates) and all other dharmas the force of which is weak and slight (that is to say, the image-aspect, *nimittabhaga*, of the consciousnesses).

(3) It is capable of increase and decrease. That dharma perfumes which is endowed with eminent activity, which is capable of increase and decrease, and capable of enveloping and planting the *vasana* (habit-energy). This definition rules out the perfect, good dharma of the 'fruit of Buddha', because these dharmas, being free from increase and decrease, cannot perfume.

(4) It is in intimate and harmonious relation with that which is perfumed. That dharma perfumes which is simultaneous with, and in the same place as, the perfumed, and which is neither identical with nor apart from the perfumed. This definition rules out the physical body of other persons and the earlier and subsequent moments. These physical bodies and the moments, not being harmoniously related with the perfumed, are not the perfumer.

Here, perfume means actualization. According to these four characteristics, therefore, it is only the first seven consciousnesses or the seven *pravrttivijnana* with their mental associates (*caittas*), but not the 8th-consciousness, to be eligible for actualizers, which are capable to actualize unmaturing karma-seeds stored in the 8th-consciousness.

3. Storage and Transmission of *Bijas*: *Bijas* Directly Producing *Bijas*

There are two categories of seeds / *bijas* : the inborn or the primary potential functional-unit / entity and the acquired or the secondary potential functional-unit / entity, as mentioned before. How can they preserve and transmit before their manifestation as actual things ? The answer is because they are preserved in the 8th-consciousness and transmitted by the process of “*bija* directly producing *bija*”. We now explain this.

The true- / pure-mind is only a dynamic potentiality. Once it is actualized / expressed as an idea, it is transformed into a kind of mind-wave. A *bija*, before its manifestation, belongs to a very fine micro-idea, a kind of very deep mind-wave, which is transcendent of the first seven consciousnesses. This micro-mind-wave, since it is radically transformed from the true- / pure-mind, moves continuously and automatically. The former produces the later, one continuing the other; and there is no interruption like the actions of waves, one continuing after another. It is also like a stream or water fall that looks like a continuum. This process is called seed / *bija* directly producing seed / *bija*. It can be shown as follows:

Seed -----> Seed -----> Seed -----> Seed ----->Seed ----->

Seeds / *Bijas* are stored and preserved in the 8th-consciousness, and each of them is merely a micro-part of the 8th-consciousness in a transformed style.

4. Expression of Karma-Seeds /*Bijas* from *Alaya*

Karma-seeds / *bijas*, after a period of development in the recessive situation, can be actualized / expressed and transformed / produced actual activities by catalysis and integration of certain conditions. This process consists of two sub-processes: (1) manifested-activity fumigating seed / *bija*, and (2) seed / *bija* producing manifested-activity. They act as cause, condition, and effect, and play out in a cycle or triangle reciprocally and simultaneously. This may be called three-dharma-actualization.

According to *the Doctrine of Mere-Consciousness* (p.133):

The consciousness that perfumes (*darsanabhaga* of a *Pravrttivijnana*) is born of *Bijas*: at the moment of its birth, it is a cause capable of increasing and creating *Bijas*. Hence three dharmas must be considered: the *Bijas* that engender the consciousness, the engendered consciousness that perfumes and creates *Bijas*, and the *Bijas* created or caused to grow by the perfuming influence of the engendered consciousness. These three revolve in a cycle reciprocally and simultaneously functioning as cause and effect, just as a candle-wick engenders the flame and the flame engenders the incandescence of the wick. Or again they are like bundles of reeds stacked side by side, each of which is supported by the other. It is in conformity with irrefutable logic to admit the simultaneity of the cause and the fruit (cause and effect).

One thing to point out is that: when karma-seed / *bija* (B) is catalyzed / actualized by certain condition (s), i.e. the manifested-activity (A) of the first seven consciousnesses, and then is transformed / expressed as another manifested-activity (C), it must be integrated with appropriate condition (s) (according to *the theory of conditioned-arising*, cf. Chapter 1). Therefore, this catalysis / actualization is different from that in chemical reactions, in which the condition, catalyzer, is not integrated into the product compounds.

The reciprocal triangular process of three-dharma-actualization can be diagrammatically shown in Fig. 20.

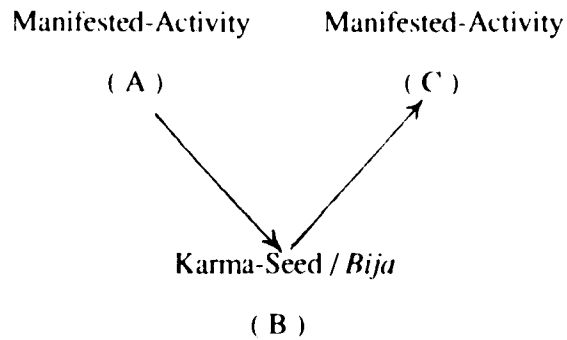


Fig. 20 Reciprocal Triangular Process of Three-Dharma-Actualization

This reciprocal triangular process is actually a continuum, and the manifested-activity is actually possesses twofold characteristics: (1) energizing and catalyzing the recessive seed / *bija*, and (2) itself producing a new-fumigated-seed / *bija* or a new-acquired-seed / *bija*. Thus, in this process, besides the two sub-processes mentioned before (namely, A to B and B to C), there is a third sub-process, that of the manifested-activity producing newly actualized seeds / *bijas* (namely, C to D). These three sub-processes can be shown in Fig. 21.

The First Seven Consciousnesses

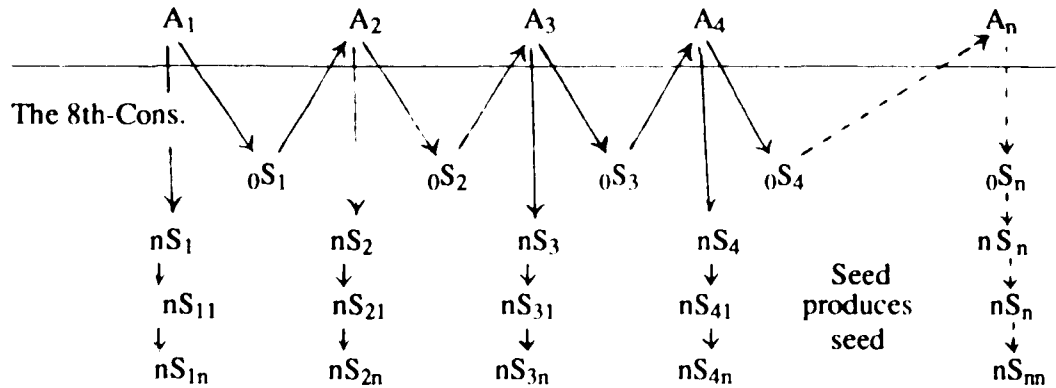


Fig. 21 Continuum of Reciprocal Triangular Seed-Expression-Fumigation Process and the Twofold Characteristics of Manifested-Activities

Where (1) $A_1, A_2, A_3, \dots, A_n$ mean manifested-activities reciprocally as causes and effects; (2) $oS_1, oS_2, oS_3, \dots, oS_n$ mean old matured seeds reciprocally as causes and effects; (3) $nS_1, nS_{11}, \dots, nS_{1n}; nS_2, nS_{21}, \dots, nS_{2n}; nS_3, nS_{31}, \dots, nS_{3n}; \dots, nS_n, \dots, nS_{nn}$ mean newly fumigated unmatured seeds continuously preserved in the 8th-consciousness by seeds continuously, automatically, and directly producing seeds.

5. Conditioned-Arising Life and Things from *Bijas* Stored in *Alaya*

Now, it is necessary to synthesize the two, actually three, processes of the catalysis (energizing) and manifestation of *bijas* in / from *alayavijnana*. According to this theory, the formation of the pheno-world, both of life or the animate-world and the universal-things or inanimate-world, consists of the processes of actualization, transformation, expression, and continuation of karma-seeds or *bijas* in / from one's own *alayavijnana* under specific conditions (these conditions also exist within these processes). These processes are essentially processes of cause-and-effect and so are controlled by *the law of cause and effect*. This theory is the basis of *the theories of wei-consciousness, the six-way of transmigraton* and *the five-skandhas and twelve-nidanas* (the latter two will be described in the next two chapters).

Three important holistic ideas to be pointed out here are: (1) A living-being (*sattva*) and its living-world (*asattva*) are considered as two different sides, the subjective and the objective, of a life-entity, which are always inseparably connected together as a whole. (2) The subjective is the major one, and the objective is the minor one; and the latter is always dependent to the former. (3) Plants are also considered as part of the living-world of living-beings; because they possess some life phenomena, although they lack Buddha (enlightened)-nature / mind-sensations and are transformed from karma-forces, transferred by relevant living-beings.

The power of the activities of the first seven consciousnesses comes from the *darsanabhaga* of the 8th-consciousness, and these activities are also transformed by fumigation and manifestation from other *bijas* stored in it. If this *darsanabhaga* of the 8th is in a delusive state and the activities of the first seven consciousnesses fumigate / catalyze the inborn-*bijas* in the 8th, then the result will be to transform this power into new karma-force, namely a new kind of karma-seed / *bija* to be formed. This newly formed karma-seed belongs to an acquired-*bija*, which is transformed into the *nimittabhaga* of the 8th-consciousness and is considered to be stored in it.

Due to this process, the 8th-consciousness is also called the storage-consciousness (*alayavijnana*) or the seed-consciousness (*bijavijnana*). Karma-seeds created by sentient-beings during the past and present life-times, are all stored in ones 8th-consciousness. More exactly, no one can create anything, one can only transform the power-energy of the *darsanabhaga* of the 8th-consciousness into karma-force / karma-seed, either under delusive condition, or *vice versa*, toward an enlightened condition.

Furthermore, these stored karma-seeds (newly formed acquired-*bijas*) have to undergo a developmental process from immaturity to maturity. Once matured and fumigated / catalyzed by certain conditions, which are manifested by other acquired-*bijas*, then they are transformed into the subjective pheno-world (for human-beings including the eight consciousnesses and the physical body) and the objective pheno-world of the present life-time retribution.

This can be shown diagrammatically in Fig. 22.

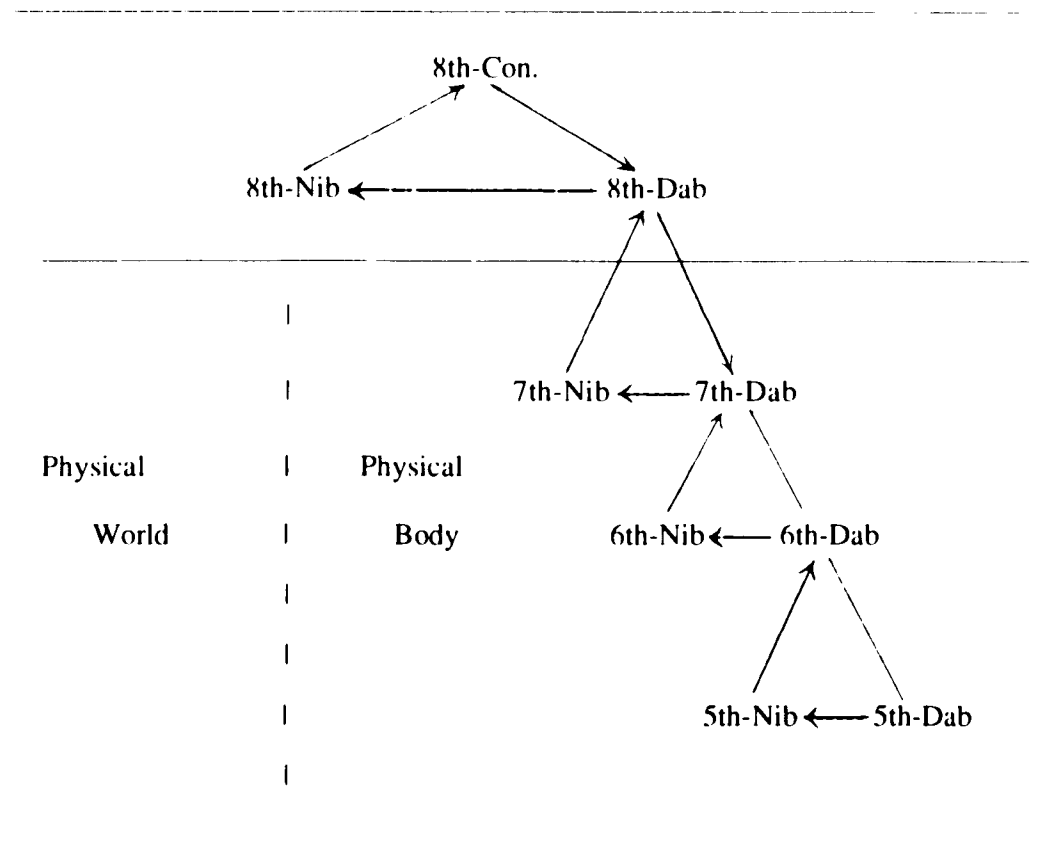


Fig. 22 Living-Beings and Their Living-Worlds by Conditioned-Arising *Bijas* from *Alaya*
Where Dab represents *darsanabhaga*; Nib represents *nimittabhaga*.

The objective pheno-world is not transformed solely by one's karma-seed, but is acted on by the common karma-seeds of all sentient-beings together. Concrete descriptions mentioned in Chapter 3 are not repeated here.

Chapter 5 Theories of Five-*Skandhas* and Twelve-*Nidanas* of Life

I. Introduction

In the first and second chapters, the most basic Buddhist theories and a universal law have been described. The third chapter has described the theory of the basic mental structure of the mind / consciousnesses mainly in mankind. This chapter is going to introduce the theories for explanation both of physical and mental structures (five-*skandhas*) and how they are in the circulation of ontological development (twelve-*nidanas*) in human-beings

The object of the exploration of Buddhist theories is very broad on the whole universe, but the central object is mankind. These theories of five-*skandhas* and twelve-*nidanas* are entirely based on the theories and universal law mentioned earlier. They are mainly restricted to human-beings, concerning psychology, embryology, genetics, and the developmental biology of man.

These theories are described as follows.

II. The Theory of Five-*Skandhas* of Life

1. Definition

The five-*skandhas* are composed of five aggregations: *rupa*, *vedana*, *sanjna*, *samskara*, and *vijnana*. The universe and all things including living-beings are all conditioned-arising

from five *skandhas* . In general, the world or universe is indicated by the summation of the changing phenomena of birth-and-death, in all of time and space. All these birth-and-death phenomena are controlled by the Buddhist *law of cause and effect and the theory of conditioned-arising*, and can be summarized as the following:

All things are arise from causes and conditions;

All things are also become extinct by causes and conditions.

However, the roots of the birth-and-death of all-things in the universe come from *vijnana* (consciousnesses) and *namarupa* (name-form). In other words, the world is formed by the power of subjective recognition of consciousnesses, mutually and relatively to respond with / to objects. Here, *namarupa* is equivalent to five *skandhas*, and the *skandha* means aggregation.

2. Physical-Mental Structures and Functions of Five-Skandhas

2.1 The *Rupa* (or Physical-Form-of-Sense-Organs)-Skandha

Rupa means form or matter, and its more exact meaning is the physical form related to the five sense-organs. According to the *Five Skandhas Sastra* : “ What is *rupa-skandha* ? It is the four great elements and all things made from them.” According to the *Abhidharma Sastra*: “ Ask: ‘ What is the form of the *rupa-skandha* ? ’ Reply: ‘ The changing phenomenon is the form of *rupa* . There are two types: one is the nature of the touchability, relativity, and capability of alteration and annihilation; and another is the nature of occupancy, direction, time, space, shape, and other abstract expression characteristics. ’ ” (Yu,1991, pp.78-79).

The Buddhist four great elements are earth, water, fire, and wind or air. They represent: (1) the four types of physical features of material, and (2) the four kinds of the nature of material, namely: solid, liquid, heat, and motivation. Therefore, these concepts include not only the ideas of form and mass, but also the idea of formless energy. Furthermore, the *Abhidharma Sastra*, very clearly points out that the concept of *rupa* is broader than that of material in Western modern physics (ibid).

Concerning the fine structure of *rupa* or material, according to the *Surangama Sutra* or *Leng Yen Ching*, (Luk, tr., 1966, p.73), it is composed of many smallest particles (discussed in more detail in later sections). However, the concept of *rupa* is dealt with in a more biological, morphological, or physiological sense, namely, considering it to be the physical basis of the five sense-organs or the whole physical body of human beings.

2.2 The *Vedana* (or Reception)-*Skandha*

The *vedana* means the reception, sensation, feeling, and functioning of the mind, or senses in connection with affairs and things. It is the response of the subjective mind to objective things. There are three kinds of *vedana*, namely: (1) joyful-*vedana*, responding in joyful feeling in one's mind and body; (2) suffered-*vedana*, responding in suffered feeling in one's mind and body; and (3) neutral-*vedana*, responding with neutral, i.e. non-joyful and non-suffered, feeling in one's mind and body.

All of these become an aggregation, called the *vedana-Skandha*, which is somewhat equivalent to the concept of emotion in modern psychology (Huang, 1978, pp. 41-42; Yu, 1991, p.79).

2.3 The *Sanjna* (or conception)-*Skandha*

Sanjna means conception, discerning, or the functioning of mind in distinguishing between receptions. In other words, when the subjective mind is discerning objective things, it takes the images of things and converts them into the imaginations of the mind. Then these imaginations become conceptions, such as, red and blue, long and short, high and low, male and female, joy and sadness, ... ; and finally names and languages are established. All of these become an aggregation, called the *sanjna-skandha*. This is somewhat equivalent to the conception of Western modern psychology (ibid).

2.4 The *Samskara* (or Mind-Action)-*Skandha*

Samskara means mind-action, i.e. the functioning of mind in its processes of regarding like and dislike, good and evil, and so on. In other words, the subjective mind first responds with receptions or sensations to objective things, and then these are converted into conceptions. After the conceptions are distinguished and discriminated, then a determination to take or abandon is made and the action of language or behavior is done. These actions become an aggregation, called the *samskara-skandha*, which is somewhat equivalent to the concept of will in modern psychology (ibid).

2.5 The *Vijnana* (or Consciousness)-*Skandha*

Vijnana means consciousness, namely, the mental faculty in regard to perception, cognition, and discrimination of affairs and things, such as: eye-consciousness being able to recognize color, ear-consciousness being able to recognize sound, nose-consciousness being able to recognize smell, tongue-consciousness being able to recognize taste, and body- / touch-

consciousness being able to recognize temperature and quality. All of these belong to an aggregation, called the *vijnana-skandha*, which is somewhat equivalent to the concept of cognition in modern psychology (Yu, 1991, p.80).

3. Analysis of Five-Skandhas

According to Buddhism, the five-skandhas are the bases of both universal-things and living-beings. They include both material and mental-factors, which are opposite but unified to each other. They are shown in Fig. 23.

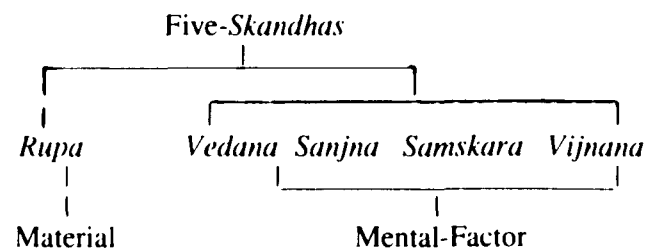


Fig. 23 Analysis of Material and Mental-Factors Including in the Five-Skandhas

Because the five-skandhas are the bases of the universal-things and living-beings, both the subjective and the objective are included within them. The *vijnana-skandha* is the subjective and the other four are the objective. They also exist in the opposite but unified positions. These can be shown in Fig. 24.

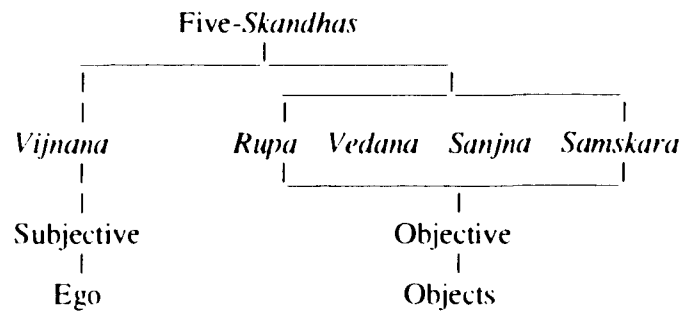


Fig. 24 Analysis of the Subjective and the Objective Including in the *Five-Skandhas*

The question arises concerning why the three *skandhas*, i.e. *vedana*, *sanjna*, and *samskara*, which belonged to mental activities originally, are also looked on as the objects. According to the *Abidharma Sastra*: “ Ask: ‘ Why do *skandhas* only have five ? ’ Reply: ‘ It is due to the expression of five ego-things. It means due to express the body ego-thing (*rupa*), sensation ego-thing (*vedana*), conception ego-thing (conception), functioning all dharma and non-dharma ego-thing (*samskara*), and what all of these depend on the self-nature-thing (*vijnana*).’ Among the five, the former-four are things-to-ego, and the fifth is ego-thing. ... Why ? Sentient-beings always hold and attach on the *vijnana-skandha* as ego, and on the others as things-to-ego.”

This illustrates that the former-four are observed and realized by ego and are only images or reflections of objective things. Therefore, they belong to things-to-ego but not ego, and only the *vijnana*, which is able to subjectively observe and realize the objective things, belongs to ego (Yu, 1991, pp.81-82).

It must be noted that *vijnana* and *namarupa* (the other four *skandhas*), the subjective and the objective, are not two things. *Vijnana* is the *vijnana* in the *namarupa* , and *namarupa* is the *namarupa* in the *vijnana* . The subjective is one of conditions to construct the objective,

and the objective is also one of conditions to construct the subjective. They can not be separated and must be dependent on one another. Therefore, in the *Samyuktagamas Sastra*, it says (ibid, p.82):

Vijnana is conditioned-arising from *namarupa*,
Namarupa is conditioned-arising from *vijnana*.

By conditioning the *namarupa*, the *vijnana* is to be;
 By conditioning the *vijnana*, the *namarupa* is to be.

This is arising if that is arising too,
 This is ceasing if that is ceasing too.

Vijnana is ceasing if *namarupa* is ceasing too,
Namarupa is ceasing if *vijnana* is ceasing too.

III. The Theory of Twelve-*Nidanas* of Life

1. Definition

The *theory of twelve nidanas or dependent origination* is a theory which mainly discusses the ontology, the individual origination and development of human-life. The Buddhist idea of life is somewhat different from that of the Western biological life. On the one hand, the former is much broader than the latter, which is unlike the latter only narrowed on this earth but includes all the different kinds of life in the relative pheno-world / universe. However, on the other hand, the former is narrower than the latter, which does not include those living-things from viruses, bacteria to whole plant kingdom.

There are two key criteria of the Buddhist idea of life: (1) life has to possess “emotion”, namely, the sensory discriminating capability of the mind / consciousnesses; and (2) every kind of life is equal and finally to be able to enlighten and become a Buddha (an enlightener). These characteristics are lacking in plant kingdom. Therefore, the Buddhist concept of life is better to be called sentient-life.

What is a *nidana* ? A *nidana* means a band, or a bond, or a link of the twelve primary causes. What are the twelve-*nidanas* ? The twelve-*nidanas* are like twelve bands, or bonds, or links by which life is banded, or bonded, or linked in the chain of existence. The name and meaning of each of these twelve-*nidanas* are described as follows:

- (1) Ignorance (*avidya*) means delusion and attachment, the different name of vexation;
- (2) Action (*samskara*) means karma caused by *avidya* due to ignorance or delusion;
- (3) Consciousness (*vijnana*) means the 8th consciousness during fertilization entered into the egg caused by the past karmas or *samskara* ;
- (4) Mind and body (*namarupa*) means other consciousnesses and physical body developed after fertilization in the embryo caused by the *vijnana* ;
- (5) Six sense-organs (*sadayatanas*) means 6 sense-organs well developed in the fetus;
- (6) Sensation (*sparsa*) means sensations produced from the *sadayatanas* caused by the 6 kinds of external conditions after birth but no perception yet;
- (7) Perception (*vedana*) means during the mind and body growing up perceptions and discriminations appeared;
- (8) Craving (*trsna*) means that during further developing the mind and body become more and more greedy and craving for the external things caused by *vedana* ;
- (9) Grasping (*upadana*) means more and more grasping the external things caused by the *trsna* ;
- (10) Coming into existence (*bhava*) means due to the present actions or karmas going to induce the future existence caused by the *upadana* ;

(11) Birth (*jati*) means the birth of the next life-time caused by the present *trsnā*, *upadāna*, and *bhava* ;

(12) Old-age and death (*jaramarāṇa*) means the old-age and death of the next life-time caused by the old-age and death of the present life-time.

2. The Circulation of Twelve-*Nidānas*

Twelve-*nidānas* act mutually as causes, conditions and fruits and express in a link or cycle situation. By such a circulation process, the life originates and always circulates. Such process can be shown in Table 12 (after Needham, 1969, with some changes).

Table 12 The Circulation of Twelve-*Nidānas* / the Dependent Origination of Life

Ignorance (<i>avidyā</i>)	causes the appearance of	action (<i>samskāra</i>)
Action (<i>samskāra</i>)	causes the appearance of	consciousness (<i>viññāna</i>)
Consciousness (<i>viññāna</i>)	causes the appearance of	mind and body (<i>nāmarūpa</i>)
Mind and body (<i>nāmarūpa</i>)	causes the appearance of	six sense-organ (<i>sādayatana</i>)
Six sense-organ (<i>sādayatana</i>)	causes the appearance of	sensation (<i>sparsa</i>)
Sensation (<i>sparsa</i>)	causes the appearance of	perception (<i>vedanā</i>)
Perception	causes the appearance of	craving
Craving	causes the appearance of	grasping
Grasping	causes the appearance of	coming into existence
Coming into existence (<i>bhava</i>)	cause the appearance of	birth (<i>jati</i>)
Birth (<i>jati</i>)	causes the appearance of	old-age & death (<i>jaramarāṇa</i>)
Old-age & death (<i>jaramarāṇa</i>)	causes the appearance of	ignorance (<i>avidyā</i>)

From above table, we can see that each of twelve-*nidanas* links with its two-side neighbor *nidanas*. The circulation of twelve-*nidanas*, we can also show directly in a cycle (Fig. 25).

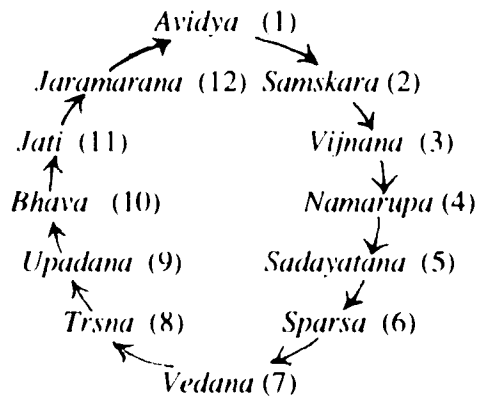


Fig. 25 The Circulation of Twelve-*Nidanas*

From Fig. 25, we can know that twelve-*nidanas* are always in circulation with beginningless and endless just like a clock. If one hopes to stop this circulation, unless one of these links can be broken or stop its action. Shakyamuni found that although this circulation is beginningless and endless, there is still a relative beginning, that is the "ignorance". If one can stop the action of ignorance, then one can stop this circulation. But how can stop it? This will be mentioned in the latter chapter.

3. The Stream of Life -- Linkage of Twelve-*Nidanas*

It has been mentioned that all of twelve-*nidanas* actually can act as primary causes, secondary causes and fruits each other. Therefore, according to the *Abhidharma Kosa Sastra*, they can be divided into past, present and future three categories, namely: (1) past --- two

causes, the ignorance and the aggregates; (2) present ---five fruits, from consciousness to sensation, and three causes, from craving to coming into existence; and (3) future --- two fruits, birth and old-age and death. These can be further explained in Table 13 (Young, 1989, p.111; Yu, 1991, pp.101-102, with some changes).

Discussion about the origination of life, there are two basic ideas which need to be explained. (1) The Buddhist idea of life is somewhat different from that of the Western biology, which is continuous, beginningless and endless, which is a special kind of force or energy and so is conserved and can never be eliminated but can only be transformed . This is the first discovery of Shakyamuni after his getting thorough enlightenment sitting under the Bodhi-tree (Suriyabongs, 1991, p. 22). (2) The meaning of "origination", therefore, does not mean that life originates on the earth, but it means the origination and transformation of one period of life-time individually. Concerning how life originating on the earth, it will be discussed later.

Table 13 Twelve-*Nidanas* Going through Three-Periods of Life-Time

Period of Time	<i>Nidanas</i>	Causality		Foldness
Past	<i>Avidya</i> <i>Samskana</i>	Delusion Karma	Cause Cause	
Present	<i>Vijnana</i> <i>Namarupa</i> <i>Sadayatana</i> <i>Sparsa</i> <i>Vedana</i>	Suffering Suffering Suffering Suffering Suffering	Fruit Fruit Fruit Fruit Fruit	First
	<i>Trsna</i> <i>Upadana</i> <i>Bhava</i>	Delusions Delusion Karma	Cause Cause Cause	Second
Future	<i>Jati</i> <i>Jaramarana</i>	Suffering Suffering	Fruit Fruit	

From the above table, within three-periods of life-time (past, present, and future), we can see that there exists two foldnesses of the small circulation of three elements (delusion, karma, and suffering), shown as in Fig. 26.

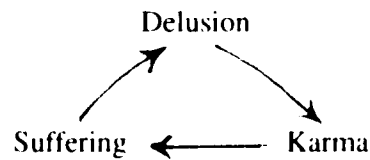


Fig. 26 The Basic Circulation of the Phenomena of Unenlightened Sentient-Life

In the following, Fig. 27 shows the linkages of twelve-*nidanas* going through three-periods of life-time; and Fig. 28 again shows such kind of linkages coming from the beginningless and continuously going to the endless if not enlightened. This is a long long stream of life. Shakyamuni first discovered this fact and also found methods to stop it --- the ways to get enlightened.

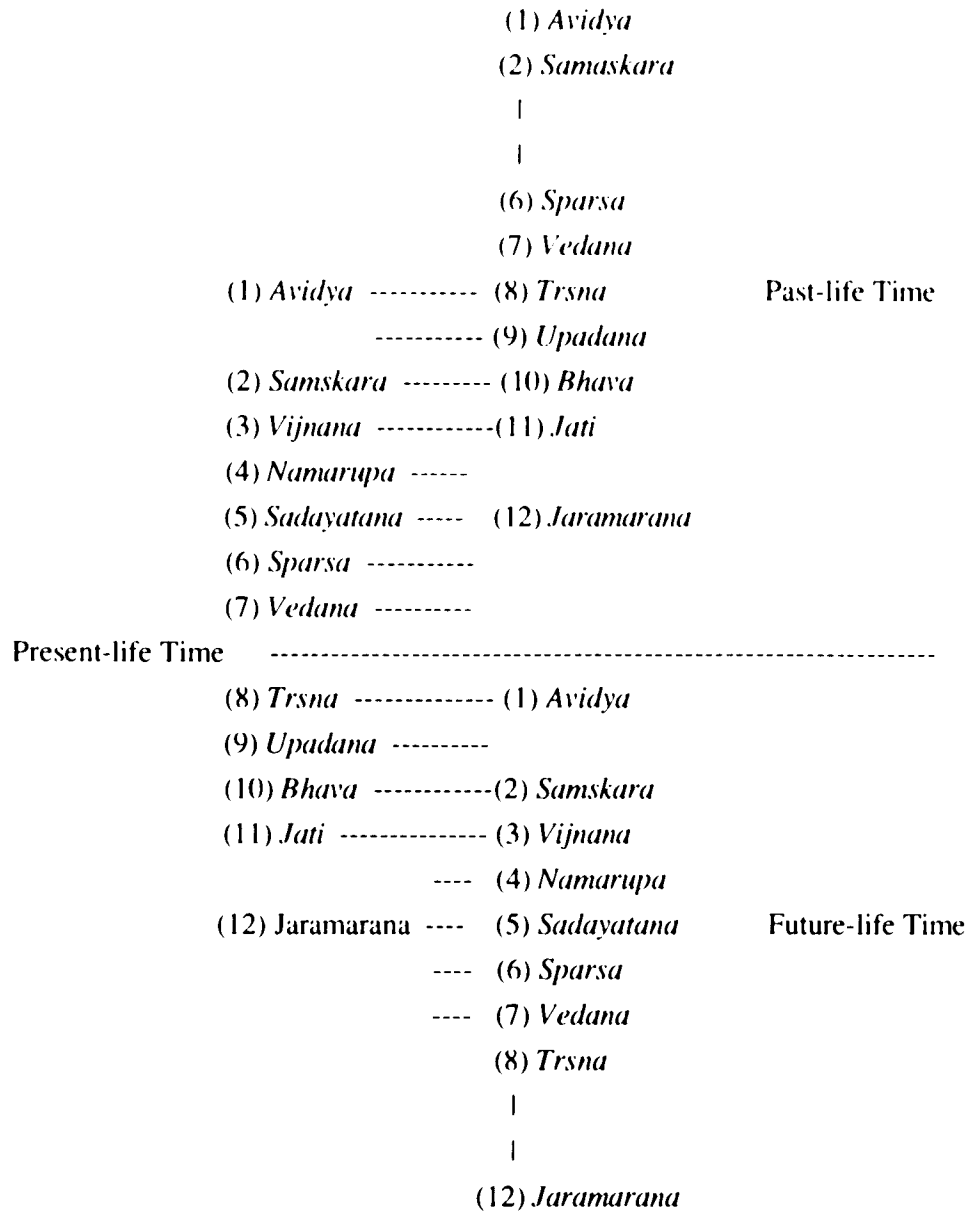


Fig. 27 Crossing-Over Linkage of Twelve-Nidanas through Three-Periods of Life-Time

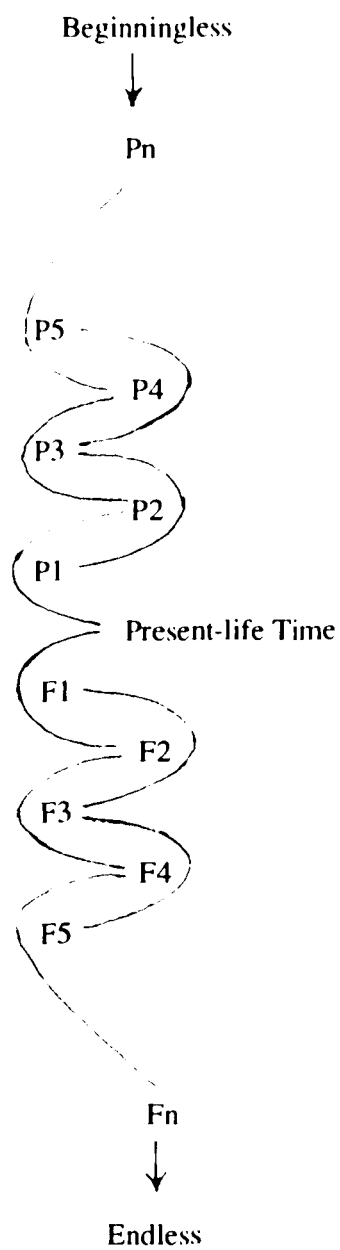


Fig. 28 Crossing-Over Links of Twelve-*Nidanas* and the Stream of Sentient-Life

4. The Root of Twelve-*Nidanas*

Now, one question may be asked: why can twelve-*nidanas* link one by one like links and circulate continuously and infinitely constructing a stream of life ? This is because there exists the 8th consciousness of every sentient-life, which is a special kind of life-force or life-energy and is conserved and can never be eliminated but only in continuous transformation. It may be said that twelve-*nidanas* are like beads and the 8th consciousness is like a string which strings the twelve *nidana*- beads. It may also be said that the 8th consciousness is like sea-water and the twelve *nidana*- beads flow on the surface of the sea-water.

Concerning these questions, they will be further discussed in Part Three.

Chapter 6 Theory of Six-Way-Transmigration of Delusive-Life

I. Introduction and Definition

On the bases of *the law of cause and effect, the theory of the karma-force (bija) and retribution of life, and the theory of wei-consciousness*, this theory describes the types and evolution of delusive-beings, their living world, the six-ways of transmigration, and the three-realms of the delusive world.

According to different situations of the false-mind / consciousness of delusive-beings and different retributions of their karma-force, delusive-beings naturally divide into six types / hierarchies, namely: heaven (*deva*)-beings, human (*manusya*)-beings, natural-spirits (*asura*), animal (*tiryagyon*i), hungry-ghost (*preta*), and hell (*naraka*)-being. Correspondingly, their living worlds (the delusory worlds) also divide into six different ways / paths or *gatis*, namely: the *deva-gati* , the *manusya-gati*, the *asura-gati*, the *tiryagyon*i-gati, the *preta-gati*, and the *naraka-gati*. These six types of beings are all in delusory situation and are transmigrating / evolving in these six different worlds (ways, paths, or *gatis*).

This is the second discovery of Shakyamuni concerning the universal phenomenon, through his thorough enlightenment and by obtaining his supervision power sitting under the Bodhi-tree. Because the other four of these six different types of beings (except human-beings ourselves and animals) and their living worlds belong to different energy-mass structures (may be belonging to different wavelength) caused by their different karma-force, we can not see them directly due to the limitation of the resolving power of our sense-ability and wisdom-capacity. This is not the strange thing, because before the enlightenment and enlargement or

recovery of his superpower of sense-ability and wisdom-capacity, Shakyamuni could not also see them directly. Buddhists believe that the phenomenon of six-way transmigration is a truth, for which they think that it has been proven by Shakyamuni's practice. However, modern Western scientists do not believe that this is true. Nevertheless, from the standpoint of superscience or metabiology, this problem may be valuable for Western biologists, psychologists and other scientists to do some research and to explore a new life area.

This chapter is to briefly describe, according to this Buddhist theory, how and why sentient-beings transmigrate and evolve in the six-ways.

II. The Six-Way Transmigration of Delusive-Beings

I. The Differentiation of the Six-Ways of Delusive-Beings

According to the Shakyamuni's discovery and descriptions of the six different types of delusive-beings and their corresponding living-worlds, it is here to briefly introduce about these universal phenomena as follows (Suriyabongs,1990, pp.22-23).

(1) *The Deva-Gati* or *Heaven way* is for beings living in excellently happy realms. This is the retribution of the highest level of the ten good-karmas created / transformed in the past life-times. It can be further divided into nine categories and twenty-eight different *devas*, which are distributed all of the three different realms (their names are not shown). The life-time of the *deva-rsis* or immortals is much longer than that of human beings, such as the life-time of the 1st category six *devas* in the desire-realm shown in Table 14 (according to Young, 1978, pp.180-182).

Table 14 Life-Time of Six Desire-*Devas* and That of Equivalent to Human Beings

Name of <i>Devas</i>	Life-Time (years)	
	<i>Deva-rsis</i>	Equivalent to Human-beings
<i>Catur-maharaja-kayikas</i>	500	9,125,000
<i>Trayastrimsas</i>	1,000	18,250,000
<i>Yama-deva</i>	2,000	36,500,000
<i>Tusita-deva</i>	4,000	73,000,000
<i>Nirmanarati</i>	8,000	146,000,000
<i>Paranirmita-vasavartin</i>	16,000	292,000,000

Due to the different karma-force and retribution of different sentient-beings in different ways, the time scale (year) in different realms is quite different. Here, this comparison of time scale between six-desire-*devas* and human-beings is according to the measurement measured by Shakyamuni's superpower of his superwisdom.

(2)*The Manusya-Gati* is for human beings and their living world. This is the retribution of the middle level of ten good-karmas created / transformed from the past. According to the *Avatamsaka Sutra* (Young, 1982, pp.3-7; Cleary, 1984) and *Abhidharmakosa Sastra* (Young, 1978, pp.175-180), human beings reside not only in this world but also in numerous other worlds in the universe. The region of our earth is located at *Jambudvipa*, one of the four continents situated at the south of the *Sumeru-Parvata* or the Mt. Sumer. The life-time of the human beings living on the four different great continents is also varied from 10 to 1,000 years old, shown in Table 15.

Table 15 The Life-time of Human Beings Living on the Four Different Great Continents
(in the Buddhist Idea of a Small World Organization in the Universe)

Name of Continent	Life-Time (years)
<i>Jambudvipa</i>	Varied (the lowest limit being 10)
<i>Purvavideha</i>	250
<i>Aparagodaniya</i>	500
<i>Uttarakuru</i>	1,000

(3) *The Asura-Gati* is a stage of non-heaven or malevolent nature spirits and their living world. This is a retribution of the lowest level of ten good-karmas and is distributed broadly as well. Some good ones can be distributed in two good ways, *deva-gati* and *manusya-gati*; and some evil ones can be distributed in two evil ways, *triyagyonigati* and *pretagati*. Because the karma of *Asura-gati* is different from that of the human beings', we can not see it. Due to the living places of this way to be distributed in some other ways, sometimes, it does not deal with as a separate way. Thus, there become only five ways. However, in general speaking, there are six different ways. The common characteristic of beings in this way is characterized by a heavy heart of anger.

(4) *The Triyagyonigati* is for animals and their living world. This is the retribution of the high level of the ten evil karmas. The body-types of animals vary widely. However, there is a common characteristic of them that their body grow and move transversely without exception. Because their karma concerning the retribution of the living world is the same as human beings, we see each other and live in the same world.

(5) *The Preta-Gati* is for hungry ghosts and their living world. This is the retribution of the middle ten evil-karmas. There are many different kinds of this being. Their general characteristics are miserly and greedy, always hungry and never to be able to get full. They have a certain space to live, but some kinds also live in some other ways, such as in the *manusya-gati* and *asura-gati*. Because their karmas are different from ours, we can not see each other.

(6) *The Naraka-Gati* is for joyless and suffering beings and their living world, which is called earth-prison or hell. This is a retribution of the lower level of ten evil-karmas. Because these karmas are much different from ours, we can not see the retribution-form of each other. There are two different categories, that of the eight hot and of the eight cold. Each of hot one is further divided into sixteen small ones, for a total of 136 hells (their names are not shown).

The six ways are also called the six dharma realms of the total of ten, which are mentioned in Chapter 3. If the power of the good karma-force is stronger than that of the evil ones, then the life-form will get a good retribution, i.e. the good life-form and good living circumstances; and *vice versa*.

2. The Transmigration of Delusive-Beings in Six-Ways

Shakyamuni also found that delusive-beings are always transforming and evolving in a circulation of the six-ways / paths, beginninglessly and endlessly, unless they do not become enlightened. This situation can be shown in Fig. 29.

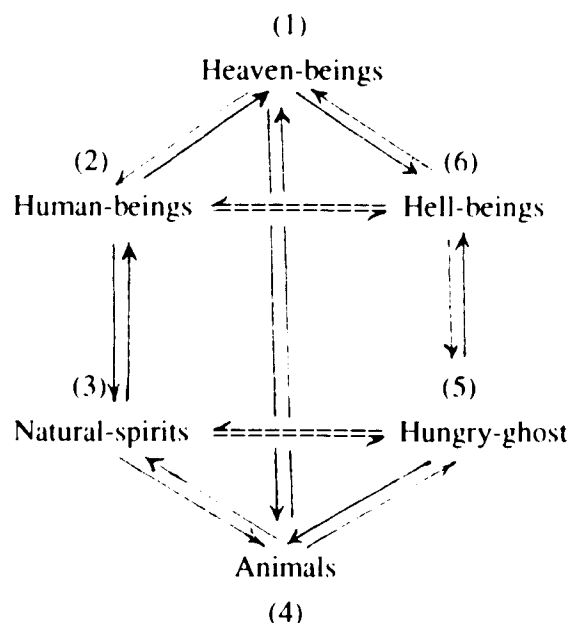


Fig. 29 Six-Way Transmigrations of Delusive-Beings

From Fig. 29, we can see that the directions of transmigration are not fixed, nor are they random. They are determined by retributions, controlled by *the law of cause and effect*, all in accord with the karma-force which were created / transformed by living-beings. Theoretically, after finishing one type of retribution, a being may transform / transmigrate into any other type of retribution during one's next life-time, during the process of transmigration. However, actually this process is not orderly and proceeding from (1) to (6) as shown in Fig.6-1, and is completely determined by one's karma-force and controlled by *the law of cause and effect*.

According to this process, generally, when one has finished a life-time of good

retribution, such as the *deva-gati* (heaven-way), one likely will transmigrate into a life-time of evil retribution, such as the *naraka-gati* (hell-way). This is because during the life-time of good retribution it was relatively easy to create evil karma-force. To the contrary, when one has finished a life-time of evil retribution, one will then have a greater possibility of being transmigrated into another life-time of evil retribution. This is because after the retribution of one's evil karma-forces one's good karma-forces, created during one's past life-time, will in turn be retributed. Nevertheless, there is an exception when one relatively controls one's actions to avoid creating evil karma during a life-time of good retribution. Then one may maintain one's good retribution during the next life-time.

Furthermore, if one can avoid creating evil karma and also creates more good karma, then one can get promoted from a relative lower hierarchy to a higher one, or even finally attain enlightenment and enter into the enlightened world. However, this is not easy to do, because when in the heaven-way, due to happy conditions, one does not feel it necessary to do this; or when in the hell-way or animal-way, because of its conditions of suffering, one may lack the wisdom to do this. According to Buddhism, the human-way is, therefore, the most ideal one for doing so.

III. Types of Birth and Forms of Existence in Delusive-Beings

1. Four Forms of Existence

In the concept of “four forms of existence”, there are four different forms or stages of a whole life cycle of each period of life-time for each individual sentient being in the six-way-transmigration. These are the different types of direct retribution for sentient-beings, which are produced according to their own karma.

Here, it is mainly dealing with situations concerning human-beings. The four forms or stages of existence are: birth, growth, death, and intermediate-state (also called negative-body, *antara-bhava* or *gandharv*). The different situations for the forms or stages of existence of human-beings in a life-cycle of one life period during transmigration are shown in Table 16.

Table 16 Different Situations of Four Forms or Stages of Existence of Human Beings

Forms or Stages	Description
Birth	at the moment of the 8th consciousness entering the egg
Growth	the period between birth and death
Death	at the moment of the 8th consciousness leaving the body
Intermediate -State	the period between after the death of the present life-time and before the birth of the next life-time

It needs to note that (1) the birth stage does not start at a moment bearing from the

material body but start at the moment of fertilization, i.e. the entrance of the 8th consciousness into the egg; and (2) the death stage is not a short time but is a process which lasts at least for 24 hours. According to Buddhism, real death is not defined by the stoppage of breathing, of heart-beating, and of the activities of the six consciousnesses, because these are only some of the events of the whole death-process. Real death occurs by the final leaving of the 8th consciousness.

Therefore, in the Buddhist view, the birth of one period of life-time is at the moment of the entrance of the 8th consciousness into the egg, and the death is at the moment of leaving of the 8th consciousness from every organ, tissue, and cell of the whole physical body. Thus, it can be said that the 8th consciousness is the master of the physical body, which works hard, continuously in every moment from its first coming until its final departure.

Growth stage is again divided into two periods, i.e. within-embryo and out-of-embryo; and each period is further divided into five different stages, shown in Table 17 and Table 18.

Table 17 Five Different Stages during the Period of Within-Embryo

Name of Stages	Characteristics
1. <i>Kalalam</i>	the aggregation of 4 elements in the 1st 7 days after fertilization
2. <i>Arbudam</i>	bearing thin layer on <i>kalalam</i> during the 2nd 7 days
3. <i>Pesi</i>	appearing of a soft flesh aggregate during the 3rd 7 days
4. <i>Ghanam</i>	appearing of a hard small body during the 4th 7 days
5. <i>Praskaha</i>	completion of the development of the 5 sense-organs and whole body from the 5th 7 days to 34th 7 days before being born

Table 18 Five Different Stages during the Period of Out-of-Embryo

Name of Stages	Descriptions
1. Baby	from birth to 6th years old
2. Child	from 7th to 15th years old
3. Youth	from 16th to 30th years old
4. Robust years	from 30th to 40th years old
5. Old years	after 40th years old

2. Four Types of Birth or *Catur-yoni*

Catur-yoni holds that there are four different types of birth of the unenlightened sentient beings in the six-ways of transmigration. These types are: *jarayuja* or viviparous or uterine-birth or womb-born, as with mammalia; *andaja* or oviparous, as with birds; *samsvedaja* or moisture-birth or water-born, as with worms and fishes; *aupapaduka* or metamorphic, as with moths from the chrysalis, with devas, in hells, or as with the first beings in a newly evolved world.

The distribution of four birth-forms in the six-way transmigration of delusive-beings is shown in Table 19.

Table 19 Distribution of the Four Birth-Forms of Delusive-Beings in the Six-Ways

Different Ways	Different Birth-Forms
<i>Deva-gati</i>	<i>Aupapaduka</i>
<i>Asura-gati</i>	<i>Aupapaduka</i>
<i>Manusya-gati</i>	<i>Aupapaduka, samsvedaja, andaja, jarayuja</i>
<i>Tiryagyoni-gati</i>	<i>Aupapaduka, samsvedaja, andaja, jarayuja</i>
<i>Preta-gati</i>	<i>Aupapaduka, jarayuja</i>
<i>Naraka-gati</i>	<i>Aupapaduka</i>

Table 6-6 shows: (a) there is only one birth-form in the three ways of *deva-gati*, *asura-gati* or semi-*deva-gati* and *naraka-gati*; (b) there are all four birth-forms in both ways of *manusya-gati* and *tiryagyoni-gati*; and (c) all ways exist the birth-form of *aupapaduka*.

Chapter 7 Theories of the *Bhutatahata* and the *Nirvana* of Life

I. Introduction

In the last chapter, how and why delusive beings transmigrate, or evolve up and down, in the three-world and six-way systems, have been described. This chapter describes how these delusive-beings can stop these processes transcending the three-worlds and six-ways to become enlightened, and thus enter into progressive evolution to estimate the highest level of enlightenment / awakening and that of the highest advanced hierarchical being, Buddha.

The *theory of dichotomous- / twofold-truth*, introduced in the first chapter, deals with both absolute and relative truths in a general sense. From Chapter 2 to the last Chapter 6, in these five chapters, although it is sometimes also to be mentioned at somewhere about the root of the relative truth, the absolute truth, it is mainly emphasized to discuss the problems about the phenomena of the pheno-life and pheno-world; in other words, they are mainly in the domain of relative truth. Therefore, it is now necessary to introduce some other theories to deal with solely and deeply about the true-life / noumo-life or the absolute truth, the noumenon or *bhutatahata* of the pheno-life or relative truth.

To research for *bhutatahata* or *nirvana* belongs to the field of ontology, and it is the most important and core part of Buddhism. It deals with the noumenon of the pheno-world or relative truth, namely, the absolute truth and absolute domain (pure entity or pure existence). According to Buddhism, the relationship between this absolute entity and existence is nothing more than the noumenon of life or mind, namely, the true-life / true-mind or *bhutatahata*. Buddhism holds three unique characteristic views:

(1) All sentient-beings equally possess their own true-life / true-mind or *bhutatahata*.

(2) All sentient-beings, however, have also contaminated and covered their true-life / true-mind or *bhutatahata* by their false-minds, misleading thoughts, or erroneous thinking. These misleading thoughts are named five aggregates (*skandhas*), i.e. form (*rupa*), reception (*vedana*), conception (*sanjna*), mental function (*samskara*), and consciousness (*vijnana*); and have been mentioned in the Chapter 5. The five *skandhas* cover one's true-life, true-mind or *bhutatahata*, just as the sun is covered by clouds. Therefore, if one hopes to recover one's own *bhutatahata* or true-life (this term will be mainly used later), one has to clean up one's contaminations, i.e. five aggregations, or more radical ignorance; just as when the clouds move away, the sunlight re-shines.

(3) Shakyamuni had shown that one can clean up one's contamination and transform one's aggregations, and can recover one's original pure-mind or true-life. He proved that the processes of contamination and decontamination are fortunately reversible. He had also demonstrated this truth by himself and taught his approaches to people (which will be introduced in the last chapter), thus others have been able to practice and demonstrate *nirvana* as well and to gradually attain / completely recover one's original *bhutatahata*.

The present two theories here deal with specifically and emphasize only the absolute truth, *bhutatahata* or *nirvana*. Because this is the root / noumenon of the relative truth, it may be said that it is the quintessence of Buddhism. However, one may ask whether there are any different meanings between these two words, *bhutatahata* and *nirvana*. It may be said that *Bhutatahata* is basically synonymous with *nirvana*, but there are also three differences.

(1) *Bhutatahata* is originally, naturally and objectively existent in the universe, i.e. in one's own-nature or self-nature, but it is generally deluded and covered by delusive-beings due

to their ignorance. However, *nirvana* is phenotypically in the reversed direction to recover and enlighten the original *bhutatathata* due to taught by enlightened person with correct theories / truths and learned, understood, especially practiced by the original delusive-person. In this sense, therefore, it may be said that *nirvana* is seemingly a reversed or enlightened form of *bhutatathata*.

(2) Due to the above situation, it is therefore, that there must be the existence of different degrees of the reversed enlightenment of *nirvana*, during the reversion processes of learning, understanding, and practicing to approach to the original, natural and whole of *bhutatathata*. Thus, this is the reason why while one has “jumped” out the delusive three-world and six-way of transmigration, there still exist four different big hierarchies (in which involve more small different hierarchies), namely, the four enlightened-beings: *Sravaka*, *Pratyeka-buddha*, *Bodhisattva*, and *Buddha*. So, *Buddha* means thoroughly enlightened being, who has completely attained *nirvana* and recovered the original, natural, and objective *bhutatathata*. Why one can not once enlighten and recover one’s own *bhutatathata*, it is because one’s ignorance, i.e. ego-attachment and especially dharma / things-attachment, can not be once cleaned completely and thoroughly, and must be cleaned gradually and subsequently, even though the degree of graduation may be also somewhat different (which will be specially discussed in the last two chapters).

(3) It may be said, therefore, that *nirvana* includes twofold meanings: (i) it is the way or approach to attain and recover one’s *bhutatathata*, (ii) it is the same thing with *bhutatathata* once it has been attained / recovered by someone through complete enlightenment.

From the standpoint of theories, *bhutatathata* and *nirvana* are here dealt with as two relatively different theories in the following.

II. The Theory of the *Bhutatahata* of Life

1. Definition:

Bhutatahata means real-so or eternal-so. It has many synonyms, such as also called one-*bhutatahata*, Buddha-nature, self-nature, real-nature, real-form, suchness, absolute entity, absolute-existence, one-reality, one-real-form, one-dharma-proof, ultimate absolute fundamental reality, or true-mind / pure-mind. Such absolute entity has no form, time, space, dimension, writing, nor speech. According to the explanation in the *Sandhi-Nirmocana Sutra*, the *bhutatahata* of all things transcends everything and is apart from words, thinking and all phenomenal forms. It is separate from the false-mind and all consciousnesses. However, at meanwhile, it is also pervading in everything and existing at everywhere, during every time.

This idea is very difficult to express directly, and one can only use analogies or metaphors to express it indirectly. It is, therefore, styled as formless, immaterial, invisible, indivisible, an unspoken reality, the unity and wholeness, or the noumenon of all things. From this point of view, it is also called emptiness, oneness, nothingness, absoluteness, formlessness, true form, dharma-nature, or *dharmakaya*.

The term of *bhutatahata* originated from the *Saddharma-Pundarika Sutra* or *Lotus Sutra*: “It is respected by numerous beings and I teach you the seal of *bhutatahata*.” Nagarjuna mentioned it in the *Maha Prajna Paramita Sastra*: “The Buddhas in the three periods all take the *bhutatahata* of all things as their teaching.” (Huang, 1978, p.57).

This theory can be also called the *theory of one-bhutatahata / one-dharma-proof*. It claims that *bhutatahata* is the noumenon of all universal things, both animate and inanimate, physical and mental, sentient and holy worlds. It appears only one unified absolute entity, however, still potentially contains two contradictory potentialities, that of complete-vacuity and

of subtle-functioning. The former is body or noumenon and the latter is the functioning, expression, or utilization of the former. From these dichotomous potentialities, *bhutatathata* can be expressed in two parts: noumenon and phenomenon, with the latter actualized from the former. Without these dichotomous potentialities, there would be nothing with the capacity to divide the two expressions.

Therefore, inner connections exist between the *theory of the bhutatathata of life* and the *theory of dichotomous / twofold-truths*. Furthermore, the phenomenal relative-truth is not only one but is actually multiple. Thus, the following must be looked as a very basic Buddhist principle, as said in *The Sutra of Hui-Neng* (Wong, tr., 1990, p.80):

All is one, and one is all.

2. Complete Vacuity of *Bhutatathata*

The empty nature of the *bhutatathata* of all universal things is complete and absolute; in other words, all things of the universe, including all living beings, are produced from a state of conditioned-arising, like a dream, lightning, shadow, or blaze, and all are only delusions / illusions (this will be further discussed in later section). There are eighteen aspects to express the meaning of the empty nature of *bhutatathata*.

(1) *Inner vacuity* means that the inner things or six *indriyas* (six sense-organs), i.e. eye, ear, nose, tongue, body, and brain, are all empty.

(2) *Outer vacuity* means the outer things or six *gunas* (six fields), i.e. sight, sound, smell, taste, tangibility, and thought, are all empty.

(3) *Inner-outer vacuity* means both inner things (six sense-organs) and outer things (six fields) are all empty.

(4) *Emptying-vacuity* means that even the idea of vacuity has to be emptied.

(5) *great vacuity* means that the ten directions, i.e. east, west, south, north, eastern-south, eastern-north, western-south, western-north, above, and below, are all empty.

(6) *Inscrutable vacuity* means *nirvana*, i.e. liberation from existence.

(7) *Phenomenal vacuity* means that all phenomenal worlds, i.e. the three realms, the realm of desire, the realm of form, and the realm of formlessness, are all empty.

(8) *Noumenal vacuity* means non-production, non-extinction, non-existence, and non-alternation.

(9) *Final vacuity* means that both relative and absolute dharmas (truths) and phenomenal and noumenal vacuity are finally all empty.

(10) *Unlimited vacuity* means that things are produced beginninglessly, extinguished endlessly, and extended borderlessly.

(11) *Dispersion and non-dispersion vacuity* means that both dispersion (a state of releasing, abandoning, and relinquishing), and non-dispersion (a state of non-releasing, non-abandoning, and non-relinquishing), are all empty.

(12) *Essential nature vacuity* means that both the essential nature of relative and absolute dharmas and the essential nature of universal-things and living-beings are all empty.

(13) *Self-form and common-form vacuity* means that both self-form (such as: change and obstacle being the self-form of material, and the act of distinguishing being the self-form of consciousness), and common-form (such as, impermanence being the common-form of relative dharma and no-ego being the common-form of absolute dharma, of all universal-things and living-beings) are all empty.

(14) *All dharmas vacuity* means that all dharmas are empty (the all dharmas are: five *skandhas*, i.e. *rupa* or matter, *vedana* or reception, *sanjna* conception, *samskara* or functions of the mind, *vijnana* or consciousnesses); twelve *ayatana*, i.e. six sense-organs and six sense-dusts; eighteen *dhatu* or realms of sense, i.e. six sense-organs, six sense-fields, and six consciousnesses of eye, ear, nose, tongue, body, and brain; form and formlessness; consciousness and consciousnesslessness; relativity and absoluteness; vexation and non-vexation ; and creativeness and uncreativeness.

(15) *Unobtainable vacuity* means that all things of the three periods of the past, present, and future are all unobtainable and are all empty.

(16) *Natureless vacuity* means that all natures are unobtainable and so are all empty.

(17) *Self-nature vacuity* means that the self-nature of the unification capability of all things is empty.

(18) *The vacuity of the naturelessness of self-nature* means that the self-nature of all things with or without unification capability is also empty.

Taken in whole, the real-form, ultimate-reality, or *bhutatathata* is formless, invisible, indivisible, unspeakable, apart from all phenomena, and in one word, is the absolute noumenon or emptiness. Therefore, as Shakyamuni emphasized: from the time of his attainment of supreme-mystic-enlightenment and his identification of Buddha nature (or *Dharmakaya*) and of supreme wisdom, through out of his forty-nine years of teaching until his one final night in a forest before his *nirvana* , he really said nothing, even one word. All that he had said in words were false and illusion, and were not the real-form */bhutatathata* itself. The real-form is absolute-truth, which can only be identified by inner observation and illuminated with the non-discriminating-wisdom or the unconditioned-mind, as taught by Shakyamuni (Huang, 1978, pp. 57-60).

3. Subtle-Functioning of Complete-Vacuity

The complete-vacuity nature of *bhutatathata* is considered the noumenon of all things and living-beings, in which all are totally unified in the ultimate and absolute realm of oneness or wholeness, which is completely and absolutely formless and empty. However, the universal things and all living-things are living and moving, expressing their tremendous vital-force and functions. This is the expression of the totipotentiality of *bhutatathata* or complete-vacuity.

According to Buddhism, complete-vacuity is equivalent to subtle-functioning, and the latter is the function of the former. Complete-vacuity possesses the undifferentiated totipotentiality of the whole universe and living-beings; and this undifferentiated totipotential subtle-functioning must be expressed in the status of complete-vacuity. The more of the complete-vacuity is lost, a greater part of the undifferentiated totipotentiality must be covered.

Therefore, it may be said that the key purpose of Buddhism is to negate the phenomenal form to reach the realm of complete-vacuity, and to affirm the true-nature of the subtle-functioning of complete-vacuity. This is the theoretical basis of dialectics to approach the realm of *nirvana*, and finally to approach to the realm of *bhutatathata*. (cf. the next chapter). In order to express or recover the totipotentiality and the subtle-functioning of complete-vacuity, one has to empty / negate all forms of all things. The concrete practical approaches see in the last chapter.

4. The Indirect Descriptions of *Bhutatathata*

To explain this theory, there are three main sutras (or scriptures). Two of them were spoken by Shakyamuni: *The Maha Prajna Paramita Hridaya Sutra* or *The Heart Sutra* (Shimano, tr., 1978) and *The Vajracchedika Prajna Paramita Sutra* or *The Diamond Sutra* (Luk, & Price, tr., 1990); another was spoken by Hui-neng (638-713): *The Sutra of Hui-neng* or *The Platform Sutra of the Sixth Patriarch* (Wong, tr., 1930/1990).

Quotations are selected as follows to show the meaning of *bhutatathata*. They are basically according to these English translations and are checked with the original Chinese versions. Some necessary changes are made.

4.1 The Indirect Description of *Bhutatathata* in *The Heart Sutra*

This sutra may be considered the summary of all Buddhist sutras, since there are only 260 words in its Chinese translation. In this sutra, Shakyamuni started to say:

Avalokitesvara, the Bodhisattva of compassion, doing deep *Prajna-paramita*, clearly saw that the five *kandhas* are *sunyata*, thus transcending misfortune and sufferings.

In the hierarchy of enlightened persons, those closed to Buddhas are *Bodhisattvas*, or *Mahasattvas*. A *Bodhisattva* has reached the point of illumination and decided not to enter into nirvana, but to continue in incarnation to help other living beings until all are free. However, how can one make these five aggregates empty? The absolute domain can not be described directly, therefore, Shakyamuni used various kinds of analogies and metaphors to teach. Let us look at how he taught his student Sariputra:

O Sariputra! Form (*rupa*) is no other than *sunyata*, and *sunyata* is no other than form. Form is exactly *sunyata*, and *sunyata* exactly form. Reception (*vedana*), conception (*sanjna*), volition (*samskara*), and consciousness (*vijnana*) are like-wise like this

It is important to note that emptiness does not mean a vacuum or void, but refers to an absolute domain or true-life / real-nature. Shakyamuni further explained the nature of emptiness for Sariputra:

O Sariputra, this feature of *sunya* of all dharma-things is neither birth nor death, neither pure nor impure, and neither increasing nor decreasing.

Here, "all things" obviously also includes life. According to our view, the emptiness of life possesses the same meaning as true-life or life-force, and life-energy is the expression of life-force conditioned by certain physical substances (these ideas will be further mentioned later). Thus, not only life-force but also life-energy are "neither birth nor death" and "neither increasing nor decreasing", in other words, they are all conservative. Therefore, 2, 500 years ago, Shakyamuni already mentioned seemingly the similar ideas of the conservation of both physical / vital energy and life-force. The conservation of physical energy, including biological energy or bio-energy fixed in high energy storage molecule ATP, has been realized

by physicists, chemists and biologists since the middle of 19th century, but the conservation of life-force has still not yet be realized by them. This is the central idea of the present study and its major purpose is to make this idea known to modern scientists.

However, Modern biologists are mostly now no more in belief of the existence both of the Aristotelian and Driesch's "special life force". The problem here is the word "special". There does not exist the "special life force", but there do exists the "non-special life force". Our term "life-force" belongs to the "non-special life force". The major difference between the two is that there is no efficient method to directly verify the former, however, there are many efficient methods to directly verify the latter. There are still several other differences between these two different concepts of life-force, but they are not discussed here now and will be discussed later in Part Three.

In the *Heart Sutra*, Shakyamuni emphasized and concluded the concepts (here the so-called "concepts" are actually "no concepts" or "conceptlessness") of life-force as follows:

Therefore, in *sunyata*, there is no form (*rupa*), no reception (*vedana*), conception (*sanjna*), volition (*samskara*) and consciousness (*vijnana*); there is no eye, ear, nose, tongue, body and mind; there is no color / form, sound, smell, taste, touch and micro-dharma-things; there is no field of sight up to no field of consciousness (*vijnana*); there is no ignorance (*avidya*) and also no end of ignorance, up to no old age and death (*jaramarana*) and also no end of old age and death; there is no suffering, no craving, no extinction, and also no Tao; there is no wisdom, and also no gain.

These are the indirect descriptions of the absolute realm or domain of the true-life and true-universe. In such absolute domain, the so-called true-life and true-universe are actually the same thing, which share the same noumenon, *bhutatathata*, and in fact unify together. There is no name, no form, no distinction, and nothing can be said at all.

4-2. The Indirect Descriptions of *Bhutatathata* in *The Diamond Sutra*

This sutra was a dialogue between Shakyamuni Buddha (the enlightened man, here also called the "World Honored One" or *Tathagata*) and his student Subhuti.

Subhuti asked:

O, World Honored One, when virtuous men or women develop the supreme-enlightenment mind, how should their minds abide and how should they be subdued ?

Buddha replied:

Subhuti, all Bodhisattvas and Mahasattvas should subdue their minds as follows: All living beings born from eggs, wombs, humidity or by transformation, with or without form, either thoughtful or thoughtless, and neither thoughtful nor thoughtless are all led by me to the final *nirvana* for the extinction of reincarnation. Although immeasurable and unlimitable numbers of living beings are thus led to the extinction of reincarnation, it is true that not a living being is led there. Why so, Subhuti ? If a Bodhisattva still clings to the false notion (*laksana*) of an ego, a personality, a being and a life, he is not a Bodhisattva.

Furthermore, Subhuti, a Bodhisattva's mind should not abide anywhere when giving Alms; that is to say, he should give without a mind abiding in form, or he should give without a mind abiding in sound, or in smell, or in taste, or in touch or in things. Subhuti, thus a Bodhisattva should give alms without a mind abiding in false notions of form *laksana*.

Buddha asked Subhuti: " Subhuti, what do you think, can the *Tathagata* be seen by means of His bodily form ? " Subhuti replied:

No, World Honored One, the *Tathagata* cannot be seen by means of His bodily form. Why ? Because what the *Tathagata* speaks of bodily form is not bodily form (ibid,p.3). Then, the Buddha said to Subhuti: " Everything with form is unreal; if all forms are seen formless, the *Tathagata* will be seen." (ibid). According to Buddhism, all Buddhas have three bodies called the *Trikaya*. They are: *Dharmakaya* (the absolute or spiritual body), *Sambhogakaya* (the body of bliss), and *Nirmanakaya* (the body of incarnation). Here, the Buddha said what "the *Tathagata* will be seen" indicating that

the absolute body will be seen. It is actually bodiless and formless. So, Subhuti's answer is correct: "What the *Tathagata* speaks of bodily form is not bodily form". Because the *Dharmakaya* is in absoluteness, it cannot be seen by the conscious-eye in bodily form. It can only be seen by the supreme wisdom transcending the bodily form

Buddha told Subhuti:

... Why ? If their minds grasp form (*lakṣaṇa*), they will cling to the notion of an ego, a personality, a being and a life. If their minds grasp the Dharma, they will cling to the notion of an ego, a personality, a being and a life. Why ? If their minds grasp the Not-Dharma, they will still cling to the notion of an ego, a personality, a being and a life. Therefore, one should not grasp and hold on to the notion of Dharma as well as that of Not-Dharma. This is why, the *Tathagata* always said: " Ye Bhiksus, should know that the Dharma I expound is likened to a raft." Even the Dharma should be cast aside; how much more so the Not-Dharma ?

The Shakyamuni again asked Subhuti: " Subhuti, what do you think, has the *Tathagata* obtained Supreme Enlightenment (*Anuttara-samyaksam-bodhi*) ? Does the *Tathagata* expound the Dharma ? " Subhuti replied:

As I understand the meaning of the Buddha's teaching, there is no fixed Dharma called Supreme Enlightenment and there is also no fixed Dharma the *Tathagata* can expound. Why ? Because the Dharma the *Tathagata* expounds cannot be clung to and cannot be expressed in words; it is neither Dharma nor Not-Dharma. Why is this ? All *Bhaddras* and *Aryas* differ on account of the Eternal *Asamkrta* Dharma.

We can see that Subhuti understood the Buddha's teaching on the absolute truth quite well. Thus, the Buddha more thoroughly explained to Subhuti: " Subhuti, the so-called Buddha Dharma is not Buddha Dharma." This is the Buddha's highest level of explanation of his absolute truth. Thus, one can know what is the *Mahayana* Buddhism. One almost can not believe: why did Shakyamuni deny his own teaching ? It is because if one wants to really understand the true Buddhism or Buddhist absolute truth, one has to first deny all conceptual

Buddhism or Buddhist relative true. If there is no negation, there will be no affirmation. This is the Buddhist dialectics.

Thus, can we also say: so-called science is not science ? It is sure that scientists will be against to this. Because science belongs to relative truth, it can not be also said in this way. However, *Mahayana* Buddhism deals with the noumenon of life and the universe, it belongs to absolute truth. The absolute truth is neither the words said by Shakyamuni nor the sutras of his teachings (or called Buddha Dharma), but it is the absolute existence of the noumenon of every life and the universe themselves. It is no form, no name, dimension, no orientation, no time and space, no generation, no extinction, not pure, not impure, not increasing, not decreasing; it can not be seen, heard, smelled, tasted, talked, and thought; it also can not be tested by any, even most elaborated and advanced physical, instrument but it only can be illuminated and identified by one's own supreme wisdom and transcendental mind just as what was first done and proved by Shakyamuni under the Bodhi-tree.

Shakyamuni again asked Subhuti: " What do you think, did the *Tathagata* obtain anything from the Dharma, when in the past He was with *Dipamkara* Buddha ?"

" No, World Honored one. When the *Tathagata* was with *Dipamkara*, He did not obtain anything from the Dharma." replied by Subhuti.

Thus, Shakyamuni concluded and emphasized to Subhuti:

Subhuti, this is why all *Bodhisattvas* and *Mahasattvas* should thus develop a pure and clean mind. They should not develop a mind abiding in form, they should not develop a mind abiding in sound, smell, taste, touch and things. They should not develop a mind abiding in anything.

Again, Shakyamuni asked: " Subhuti, what do you think, does the *Tathagata* expound the Dharma ? "

" World Honored One, the *Tathagata* does not expound anything."

" Subhuti, what do you think, are there many particles of dust in a great chiliocosm or *Tri-sahasra maha-sahasra loka-dhatu* (to be explained later) ? "

" Many, World Honored One! "

" Subhuti, the *Tathagata* says these particles of dust are not dust, thus are called dust. The *Tathagata* says the universe is not universe, thus is called universe."

At that time, after listening to this *sutra*, Subhuti had understood its profound meaning and was moved to tears. He said to the Buddha: " How rare, O World Honored One! The Buddha has expounded such a very profound *sutra*. Since I have acquired the wisdom eye, I have not heard of such a *sutra*. World Honored One, if someone after listening to this *sutra* believes that his mind is clean and pure, he will realize the true-form. We should know that such a person will achieve the highest and rarest merit. World Honored One, this true-form is not a form, thus the *Tathagata* names it true-form. ... The forms of an ego, a personality, a being and a life are not forms. Why ? People apart from all forms are called Buddhas." (ibid, p.10).

Shakyamuni again emphasized:

... Therefore, Subhuti, Bodhisattvas should forsake all conceptions of form and resolve to develop the Supreme Enlightenment Mind. They should not abide in form to develop their minds, should not abide in sound, smell, taste, touch and things to develop their minds. They should develop non-abiding minds. ... The *Tathagata* says that all forms are not forms, and that all living beings are not living beings.

Shakyamuni further guaranteed for Subhuti:

Subhuti, the *Tathagata* is one who speaks true words, real words, ultimate words; and does not speak deceitful words, heterodox words. Subhuti, the Dharma the *Tathagata* has obtained is neither real nor unreal.

.... " *Tathagata* " means the suchness of all Dharmas. If someone says:" The *Tathagata* obtained the Supreme Enlightenment ", Subhuti, there is no Dharma by means of which

the Buddha obtains the Supreme Enlightenment. Subhuti, the Supreme Enlightenment obtained by the Buddha is by itself neither real nor unreal. This is why the *Tathagata* says that all things are Buddha Dharma. Subhuti, these so-called all things are not all things, thus are called all things.

" Subhuti, what do you think, if there are Ganges rivers as many as the number of the sand-grains of a Ganges and there are Buddha worlds as many as the number of the sand-grains of all these Ganges rivers, are they many or not ? "

" Many. World Honored One! " Subhuti replied. Then, Shakyamuni told Subhuti:

In all of these worlds, the *Tathagata* knows how many kinds of the minds of all sentient beings exist. Why ? The minds the *Tathagata* speaks of are not minds, thus are called minds. And why ? Subhuti, the past mind cannot be found, the present mind can not be found, and the future mind can not be found too.

" Subhuti, how do you think, can *Tathagata* be seen by His complete perfect forms ? "

" No, World Honored One, *Tathagata* should not be seen by complete perfect forms. Why ? *Tathagata* says the completely perfect forms are not completely perfect, thus are called completely perfect forms." (ibid, p.18). Thereafter, Shakyamuni further recited a *gatha* as follows:

If one sees me by color (and form),
And seeks me in sound;
One treads on the heterodox path,
And cannot find the *Tathagata*.

Then, Shakyamuni again told Subhuti:

Subhuti, do not say that the *Tathagata* thinks: " I should expound the Dharma". Do not have such a thought. Why ? If someone says the *Tathagata* has expounded the Dharma, he slanders the Buddha because he isn't able to understand my teaching. Subhuti, so-called expounding the Dharma, there is no Dharma to be expounded, this is called expounding the Dharma.

Here, Shakyamuni was talking about the Dharma-body or absolute-body. There is actually not any bodily form, not even a complete and perfect form able to be seen, because the Dharma-body is no-body and no-form. It is only an absolute existence. The so-called Dharma is actually the same thing as the absolute-body. It is also only an absolute existence, therefore, nothing can be actually spoken or expounded. *Mahayana* Buddhism (or *Asarnakrta Dharma*) deals with the absolute truth. The absolute truth itself can be spoken anything because it is "nothingness". So, if someone says that he can speak something directly about the *Asarnakrta Dharma* itself, he is in slandering because he does not actually understand what is the real *Asarnakrta* Buddhist Dharma or the absolute truth.

However, Shakyamuni also had to emphasize the function of the absolute truth from another point of view. Therefore, he told Subhuti:

Subhuti, if you arise this kind of thought: the *Tathagata* , due to not relying on complete perfect form, obtained the Supreme Enlightenment; Subhuti, banish this kind of thought: the *Tathagata* , due to not relying on complete perfect form, obtained the Supreme Enlightenment. Subhuti, If you arise this kind of thought to develop the Supreme Enlightenment Mind, you advocate the annihilation of all things. Don't arise this kind of thought ! Why ? One who develops the Supreme Enlightenment Mind, does not advocate the annihilation of things.

It is necessary to note here that in *Mahayana* Buddhism the conception of non-annihilation is as important as the conception of non-attachment. Non-attachment of all things can allow one to discover, or more exactly to recover, one's Dharma (absolute) body or the noumenon of life and universe or the absolute truth of life and universe. However, non-annihilation can also lead one to find the living absolute-body or absolute-truth. If there is no non-annihilation, one can at most only find a dead absolute-body or absolute-truth. But the dead one is actually not the true one.

Therefore, if one is willing to develop the Supreme Enlightenment Mind in order to recover one's absolute-body and to find the absolute-truth of life and universe, one has to practice in accordance with both sides of the rules of non-attachment and non-annihilation.

Let us see what Shakyamuni further told Subhuti:

Subhuti, if someone says the *Tathagata* comes or goes, sits or lies, he does not understand what I mean. Why? The *Tathagata* neither has whence come, nor will whither go, thus is called the *Tathagata*. Subhuti, if virtuous men and women destroy the great chiliocosm into dust particles, how do you think, would those dust particles be many?

Subhuti replied:

Many, World Honored One. Why? If the dust particles were really true, the Buddha would not say they were dust particles. That is why the Buddha speaks of dust particles, they are not dust particles, thus are called dust particles. World Honored One, what the great chiliocosm said by the *Tathagata* is not cosmos, thus called cosmos. Why? If the cosmos is really true, it is an agglomerated-form. What the agglomerated-form said by the *Tathagata* is not an agglomeration, thus called an agglomerated-form.

In order to make it more clear what is agglomerated-form said by Subhuti, Shakyamuni further explained:

"Subhuti, so-called agglomerated-form is an unspeakableness, but the vulgar men are greedy for it and attached to it."

One must point out that the agglomerated-form mentioned by both Shakyamuni and Subhuti is also not a relative, and only a physical concept, but it is an absolute concept too.

Therefore, Shakyamuni emphasized that people should not be "greedy for and attached to it", otherwise, they can not reach the absolute domain of life and universe even though they can understand cosmonautics and take a "cosmo-shuttle" to travel to other stars in the universe.

At the end of *The Diamond Sutra*, Shakyamuni summarized:

Subhuti, one who develops the Supreme Enlightenment Mind, should thus know, thus see, thus believe and comprehend, and not arise the dharma-form (*dharma-laksana*). Subhuti, what one says the dharma-form, the *Tathagata* says that is not dharma-form, thus called dharma-form.

Subhuti, ... how should one make a lecture for people ? One does not take on forms but with the immovability of absoluteness. Why ? Because one knows that:

All phenomenal things (*samskṛta dharma*) are like
A dream, an illusion, a bubble, and a shadow,
Like dew and lightening,
Should one observe them in such a way.

4.3 The Indirect Descriptions of *Bhutatathata* in *The Sutra of Hui-Neng*

This is a very popular and relatively recent sutra spoken by the Chinese 6th Zen Patriarch, Hui-Neng (638-713). He was originally a poor uncultured peasant and could not read. However, after he had become enlightened, he identified and reached the realm of absolute truth and he understood the highest knowledge of life and the universe. He exactly predicted the date and time of his death before one year and died sitting in meditation with no disease.

The strangest thing is that his body is still preserved at Nan-Hua Monastery in Canton, China (see Plate 3, in Chapter 9).

Here, quotations are introduced from the English translation made by M.L.Wong (1930 / 1990), but some changes have been made by checking with the original Chinese version.

In this sutra, the 6th patriarch said:

Learned Audience, the wisdom of enlightenment (*bodhiprajna*) is inherent in every one of us. It is because of the delusion under which our mind works that we fail to realize it ourselves, and that we have to seek the advice and the guidance of enlightened ones before we can know our own essence of mind. You should know that so far as buddha-nature is concerned, there is no difference between an enlightened man and an ignorant one. What makes the difference is that one realizes it, while the other is ignorant of it. Now, let me talk to you about the dharma of *mahaprajnaparamita*, so that each of you can attain wisdom.

What does *mahaprajnaparamitta* mean? The patriarch explained: "The word *mahaprajna-paramita* is Sanskrit, and means 'great wisdom to reach the opposite shore' (of the sea of existence)." Then, what is *maha*? The patriarch further explained:

It means "great". The capacity of the mind is as great as that of space. It is infinite, neither round nor square, neither great nor small, neither green nor yellow, neither red nor white, neither above nor below, neither long nor short, neither angry nor happy, neither right nor wrong, neither good nor evil, neither first nor last. All buddha-*kshetras* (lands) are as void as space. Intrinsically our transcendental nature is void originally and not a single thing can be attained. It is the same with the absolute voidness of the own-nature.

Learned Audience, when you hear me talk about voidness, you at once abide on it. The utmost importance is that we should not abide in the voidness. If one sits quietly and keeps his mind blank he will abide in a state of voidness of indifference.

The patriarch continued to say:

Learned Audience, the illimitable void of the universe is capable of holding myriads of things of various shape and form, such as the sun, the moon, stars, mountains, rivers, worlds, springs, rivulets, bushes, woods, good men, bad men, dharmas pertaining to goodness and badness, deva planes, hells, great oceans, and all the mountains of the Mahameru. Space takes in all of these, and so does the voidness of our nature.

Learned Audience, it is said to be great that our own-nature can embrace all things. All things are within our nature. If we see the goodness and the badness of other people to be not attracted by them, not repelled by them, nor contaminated by them and attached to them, and our attitude of mind is as void as space; thus, this means great and is called *maha*.

Then, what is *prajna* ? The patriarch again explained:

Learned Audience, you should know that the mind is very great in capacity, since it pervades the whole *dharmadhatu* (the universe). When we use it, it is so bright that we can immediately distinguish and realize everything. All is one and one is all. It is totally in liberty to come or to go, and there is without any hindrance between mind and body. This is called *prajna* .

Learned Audience, all *prajna*- wisdom comes from our own-nature and not from an exterior source. Have no mistaken notion about that. This is called the self-use of the true-nature. Once one is true, then all is true too. ...

Learned Audience, what is *prajna* ? It means "wisdom". If at all times and in all places we steadily keep our thought free from foolish desire, and act wisely on all occasions, then we are practicing *prajna* . One foolish notion is enough to shut off *prajna* , while one wise thought will bring it forth again. People in ignorance or under delusion do not see it; they talk about it with their tongues, but in their minds they remain ignorant. They are always saying that they practice *prajna* , and they talk incessantly about voidness; but they do not know the absolute voidness. There is neither form nor characteristic for *prajna* , it is the wisdom-mind. If we interpret it in this way, then indeed it is the *prajna*- wisdom.

Now, it has to be asked: what is *paramita* ? The patriarch again explained:

It is a Sanskrit word, meaning " to the opposite shore". Figuratively, it means " above existence and non-existence". By clinging to sense objects, existence or non-existence arises like the up and down of the billowy seawater, and such a state is called metaphorically "this shore"; while by non-attachment a state above existence and non-existence, like smoothly running water, is attained, and this is called "the opposite shore". This is why it is called *paramita* .

Learned Audience, people under illusion recite with their tongues, and while they are reciting erroneous and evil thoughts arise. But if they put it into practice unremittingly, they realize the true-nature. The enlightenment of this dharma is the *prajna*-dharma, and the practice of this is the *prajna*-practice. One who does not practice this is an ordinary man. One who practices this, even for one moment, is the equal of Buddha.

The patriarch continued to say:

Learned Audience, an ordinary man is also a buddha, and *klesha* (vexation) is equal to *bodhi* (enlightenment). A foolish passing thought makes one an ordinary man, while an enlightened second thought makes one a buddha. A passing thought that clings to sense objects is *klesha*, while a second thought that frees one from attachment is *bodhi*. Learned Audience, the *mahaprajnaparamita* is the most exalted, the supreme, and the foremost. It neither stays, nor goes or comes. By means of it buddhas of the present, the past, and the future generations attain buddhahood. We should use this great wisdom to break up the vexations of five skandhas, for to follow such a practice ensures the attainment of buddhahood. If one is free from vexation, wisdom always reveals itself and does not separate from one's own-nature. To enlighten this dharma is equal to thoughtlessness.

Thus, there is no recollection, no attachment, and no generation of falsehood. One should put one's own-nature of *bhutatathata* into operation, and use *prajna* for observation and illumination to take an attitude of neither taking nor abandoning toward all things. This is meant that one realizes one's own-nature and attains the buddhahood.

After the explanation of the meaning of *mahaprajnaparamita*, the patriarch further explained how to realize the realm of absoluteness and to attain the buddhahood:

This *dhammaparyaya* or dharma gate belongs to the highest *yana* or vehicle and it is taught for the very wise and quick-witted. If the less wise and the slow-witted hear about it, they would doubt its credibility. ... One who does not enlighten one's own-nature is called the slow-witted. If one enlightens the sudden-teaching and does not attach to external rituals, but always functions one's own-mind under right views and free from the contamination of vexations and passions, one is said to realize one's own-nature.

Learned Audience, if one is independent from both the internal and the external and in liberty for both coming and going, one can be free from mind-attachment and thoroughly enlightened without the least beclouding.

The patriarch further, with his own experience, explained thoroughly and penetratedly--- what is the absoluteness and what is the difference between a buddha and a sentient being as well as how to suddenly become enlightened and immediately attain the buddhahood, i.e. the final absolute domain:

Learned Audience, with no enlightenment a buddha is a sentient being and by even a gleam of enlightenment a sentient being is a buddha. Therefore, all dharmas are immanent in one's own-mind, why should one not suddenly realize the *bhutatathata* essential-nature from one's own-mind ? The *Bodhisattva Shila Sutra* says: " One's essence of own-nature is intrinsically pure. If we know our own-mind and realize our own-nature, we would all attain the buddhahood." The *Vimalakirtinirdesha Sutra* says: " One can suddenly become enlightened and at once regain one's own-mind." Learned Audience, when I heard of these from the fifth patriarch, I became enlightened immediately just after his speech and suddenly realized the real-nature of *bhutatathata*.

To summarize, the 6th Patriarch in his sutra talked about the terms: real-form, essential-nature, true- or own-mind, real- or own-nature, and *bhutatathata* , which are all the different names with the same meaning of buddha-nature and absoluteness. He much emphasized that every one, including every sentient being, possesses one's own buddha-nature but it is contaminated and deluded and thus one is always ignorant of it. Therefore, the 6th Patriarch also much emphasized that one should suddenly get enlightened to recover one's own immanently pure and bright buddha-nature and *prajna* wisdom. Such an approach is called *dhyana* or Ch'an (Zen), which will be discussed in Chapter 9.

III. The Theory of the *Nirvana*:of Life

1. Definition

Nirvana means extinction which differs from the concept of annihilation. The latter is the last of the four stages of conditioned-arising, and is also the root of conditioned-arising. If one is unaware of this and makes the mistake to believe in the phenomena of conditioned-arising, then one falls into the systems of circulation of the twelve-*nidanas* and six-ways of transmigration / rebirth. The concept of annihilation is opposite to that of generation or production, and it belongs to the relative pheno-world. But the concept of extinction, because it has no opposite side, belongs to the absolute noumo-world.

Nirvana or extinction includes two concepts: (1) first to extinct the relative phenomena of conditioned-arising of generation and annihilation, and (2) then to extinct all of suffering through entry into the noumo-world with absolute freedom and happy life. It is important to distinguish between these two different concepts. In other words, there are two big steps or hierarchies to approach the complete *nirvana* or *bhutatathata*: the first step is to reach the primary enlightenment to firstly “jumping out” the delusive-world, i.e. the three-worlds of six-way transmigration described in Chapter 6, and to enter into the enlightened-world; then the second step is to make further advance in the enlightened-world and finally to approach to the thorough enlightenment and complete *nirvana* or *bhutatathata*.

The *theory of the nirvana of life* means by the extinction of ignorance and delusion, greed and hatred, to extinct the birth and death, old-age and disease, and all other sufferings, then to recover the perfect supreme wisdom, the absolute truth and the infinite reality, and finally to reach the absolute freedom and true happy-life, the thorough *nirvana* or *bhutatathata*.

2. *Nirvana*: Stopping Six-Way Circulation and Solving Life-Riddle

Shakyamuni abandoned his prince position to explore the riddle of life. After twelve years of hard exploration and practice, due to his enlightenment and recovering his perfect wisdom, his observing ability greatly enlarged. He discovered and directly observed the actual facts of the twelve-*nidanas* and the six-ways of transmigration / rebirth-circulation, thus opening the riddles of life and of the universe. These look like two but their root is one, two branches of one root.

If one asks what the root or focus of these two riddles is,
Shakyamuni found it to be “ignorance” !

The actual meaning of “ignorance” is that it is the state of ignoring the theories mentioned above. It occurs because one ignores the delusive-nature of the phenomena of conditioned-arising. Thus, one misunderstands them to be true and incorrect, and believes and acts according to them.

Significant problem arises at this point. After attaining enlightenment, Shakyamuni’s first word was (Young, 1982, p.15):

Strange! strange! All sentient beings possess the *Tathagata's* perfect wisdom and moral power, to which they can not approach only if they hold on to false or erroneous views. If they can leave the misfallen holding and false-views, then perfect wisdom, inborn wisdom, and self-attained wisdom will appear immediately

In the *Catur-Agamas Sutra*, Shakyamuni also said:

Because this is existing, that is existing too; and because this is generating, that is generating too. Because this is non-existing, that is non-existing too; and because this is annihilating, that is annihilating too.

Shakyamuni found that the way to attain *nirvana* was first to stop and annihilate the “ignorance” in the circular chain of twelve-*nidanas*, as mentioned in *the theory of five-skandhas and twelve-nidanas of life*. In this annihilation of the first link, “ignorance”, all the other eleven links are also annihilated one by one automatically. The meaning of annihilation of ignorance holds that one has realized the meaning of the above theories, especially the *theory of conditioned-arising and its emptiness-nature*, and is no longer attached to beliefs about the relative phenomena of conditioned-generating and conditioned-annihilating.

In this way, both the circulation of the twelve-*nidanas* and the six-ways of rebirth / transmigration are stopped, respectively. Next, the absolute extinction-realm of *nirvana* is finally attained. The cutting-point is shown in Fig. 30.

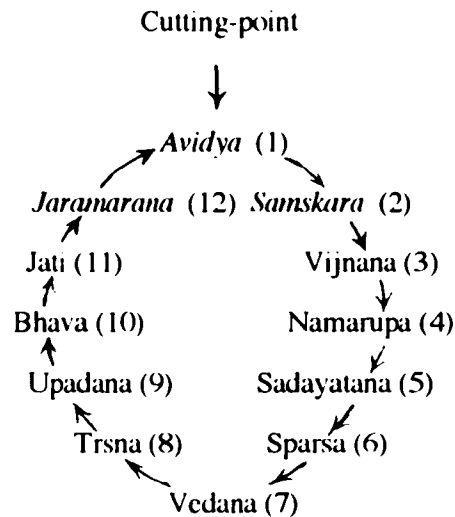


Fig. 30 The Cutting-Point on the Circular Chain of the Twelve-*Nidanas*

Detailed approaches to attain the realm of *nirvana* are mentioned in Chapter 9.

3. Three Rules for *Nirvana* / Enlightenment

From the viewpoint of time, space and origination concerning the problems of ignorance, enlightenment and *nirvana*, there are three rules for this theory.

(1) *The Rule concerning the Beginningless and Endless of Nirvana*: As mentioned above, the complete *Nirvana* is the synonym of *Bhutatathata*. It is also the synonym of perfect wisdom, primal wisdom, great round-mirror wisdom, or complete-perfect-real-nature. In one word, *nirvana* is an absolute silent realm, the final permanent realm of the true life and the universe. *Nirvana* is transcendental of time and space, therefore, it is beginningless and endless.

(2) *The Rule concerning the Beginningless-only and Endness of Ignorance*: Although ignorance is beginningless as is *nirvana*, it may become endless if one gets enlightened. The *Sutra of Hui-Neng* says (Wong, 1990, pp.81-82; with some changes):

One foolish notion is enough to shut off *prajna* (wisdom), while one wise thought will bring it forth again. People in ignorance or under delusion do not see it; Ordinary man is equivalent to buddha (enlightened-man), and *klesha* (vexation) is equivalent to *bodhi* (enlightenment). A foolish passing thought makes one an ordinary man, while an enlightened second thought makes one a buddha. A passing thought that clings to sense objects is equivalent to *klesha*, while a second thought that frees one from attachment is equivalent to *bodhi*.

Therefore, a layman can be changed to a Buddha and a state of vexation can be transferred to awakening / enlightenment. It is the same ignorance may be changed to wisdom. These things are possible because the Buddha and the layman, vexation and enlightenment, and ignorance and wisdom are from the same absolute noumenon. This is the hope that all sentient beings can solve their life problems: stopping their beginningless traveling

in the six-ways of rebirth / transmigration.

(3) *The Rule concerning the Beginningness-only and Endless of Buddhahood* : It is an oppsite to the state of ignorance that the enlightenment to a buddhahood is beginningness-only and is endless as well. This means that once a sentient-being has attained *nirvana* and Buddhahood, he / she will never be reduced back again unless he / she automatically is born by metamorphosis for practicing willingness to save sentient-beings. When an enlightened individual attains the position of *Arhat* , he starts to obtain the unreducibility.

The situation of one-way reducibility between ignorance and *nirvana* is shown in Fig.31.

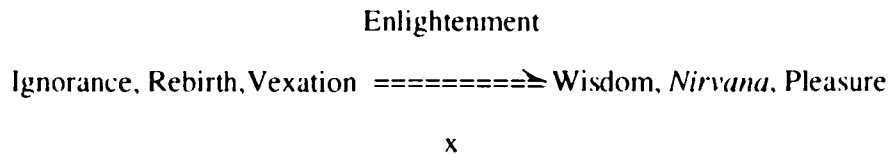


Fig. 31 One-Way Reducibility of Transformation between Ignorance and *Nirvana*

4. What Needs to Do after Attaining *Nirvana*

Now, there is another question: what needs to do after attaining *nirvana*. Because there are two kinds of ignorance, *atma-graha* or holding to the concept of the ego, and *dharma-graha* or holding to things as realities, there are also two kinds of *nirvana*, primary-*nirvana* and complete-*nirvana*. According to the buddhist practical experience, if a practitioner only

has extincted his *atma-graha* and attained to the *anatman* or egoless realm, he can only attain the realm of primary-*nirvana* and primarily transcend out off the six-ways of rebirth / transmigration to prove the retribution of the *Arhat* hierarchy / fruit-position, the highest position of *Sravaka*.

However, because the *Arhat* still exists the *dharma-graha* (which is even more difficult to extinct than *atma-graha*) and only considers his personal transcendental *paramita* with no great willing for consideration of the transcendental *paramita* of numerous sentient beings, he can only stay at this hierarchical¹ fruit-position and can not further reach the complete-*nirvana* or *bhutatathata* and the buddhahood hierarchical fruit-position unless he changes his attitude to the *Mahayana* one. Therefore, the *Arhatship* is called the *Hinayana*, the small-career or the lessor vehicle.

On contrast, the *Bodhisattvas* practice still very hard to further extinct the *dharma-graha*, after they have already extincted the *atma-graha*. Therefore, they can attain the relatively higher hierarchical fruit-position. Furthermore, when *Bodhisattvas* have already in the great extent extincted both the *atma-graha* and *dharma-graha* and attained the almost complete *nirvana*, but they still raise their great willings to continuously further extinct these two *grahas* and also to continuously further save numerous sentient beings.

As to the Buddhas, although they have already thoroughly extincted both *grahas* and already completely recovered their *bhutatathata* thus to attain both the complete-*nirvana* and the buddhahood hierarchical fruit-position, they are still at every moment doing the work of saving the numerous sentient beings.

However, even though the numerous sentient beings have all been saved, both Buddhas and *Bodhisattvas* never have raised an idea that they have even liberated one sentient beings. Just like Shakyamuni in the *Diamond Sutra* told to Subhuti that one must generate such an attitude of mind (Price, tr., 1990, p.37):

I must liberate all sentient beings; yet when all have been liberated, verily not anyone has been liberated. Wherefore ? If a *Bodhisattva* cherishes the form of an ego, an individuality, a being, and a longevity, he is consequently not a *Bodhisattva* , Subhuti.

It has been discussed before that there are different degree of enlightenment for *nirvana*. Although *Arhat* has attained *nirvana* and “jumped out” the delusive-world (three-delusive-worlds and six-ways of rebirth) entering into the realm of *nirvana* and the enlightened-world, this has only attained the first of the two big steps of *nirvana*, the primary-*nirvana*, but not yet the complete -*nirvana*. So, the practitioner needs further practice, otherwise, there will be no further progresses and can not finally attain the complete-*nirvana* and thoroughly recover the original *bhutatathata*.

Therefore, after a *Mahayana* practitioner has reached the realm of primary-*nirvana* , there are actually more things to do than ever before. However, the things are not for himself, but for others.

Chapter 8 Theories of Dialectics and *Hetuvidya*

I. Introduction

If there were no special and correct ways of thinking and working approaches or methods (both theoretical and practical), there would be no philosophy, science, new discoveries, nor progress in human cultures. Shakyamuni attained enlightenment and discovered the basic laws and truths of the universe and life to reach the Buddhahood domain, because he found new approaches to thinking and correct practice, which are introduced briefly here.

To get Buddhist research results, it is first necessary to consider right principles and approaches or methods. Without which, there will be no right results. Buddhist research methodology has been recently described in detail by Ng (1989). The purpose of Buddhist researches both theoretical and practical is to attain *nirvana* or enlightenment, and then to jump out from the three delusive-worlds or the six-ways of transmigration to reach the four awakening-worlds, namely, to evolve to the highest hierarchy of universal-beings, Buddha.

In Buddhism, there are two divisions of the ways to attain the different hierarchies of *nirvana*, the *Hinayana* and the *Mahayana*. Because the goals of the two are different (the former is *Sravaka* and *pratyeka-buddha*, and the latter is *Bodhisattva* and Buddha), their methods are also different. For attaining *Sravaka*, the methods of fourfold-noble-truth / eightfold-noble-path and five-*skandhas* are to be used; and for attaining *Pratyeka-buddha*, the method of twelve-*nidanas* is to be used (five-*skandhas* and twelve-*nidanas* were introduced in Chapter 5).

While there are many methods in *Mahayana* Buddhism to attain the relatively high level of *nirvana*, they can be divided into two categories: theoretical and practical. Theoretical methods can be further divided into other two types: dialectical and *hetuvidya*. Practical methods can also be further divided into two categories: the Sect and the Teaching. The Sect can be divided into two: the Silent-Questioning and the Silent-Illumination. The Teaching can be divided the Exoteric and the Esoteric (or Tantric) two types. Both of these can be further divided into the Silent-Observing and the Chanting or Reciting two methods. These are diagrammatically shown in Fig. 32.

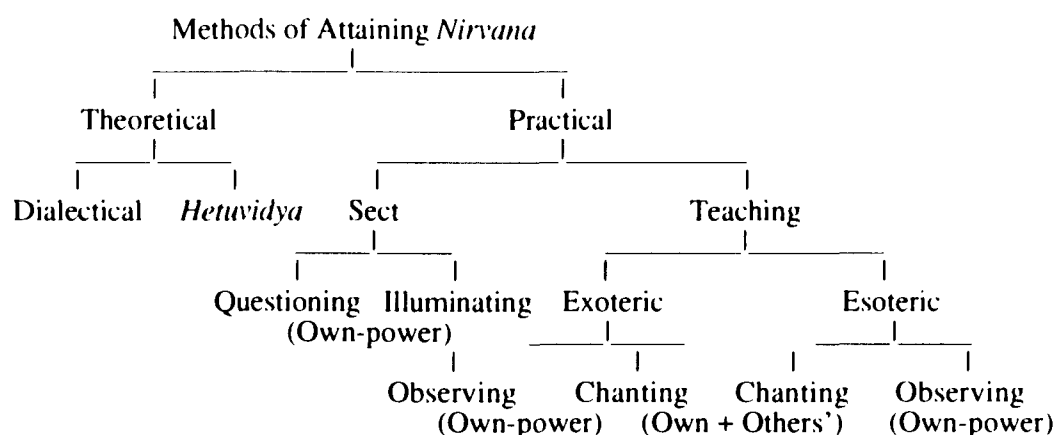


Fig. 32 The Classification of Methods for the Attainment of *Nirvana*

From Fig. 32, it can be seen that practical methods are of two types: (1) by one's own-power, (2) by one's own-power plus other's (that of Buddhas' and Bodhisattvas'). It can also be seen that the chanting methods are all by one's own-power plus others' and the other methods are all by one's own-power. These will be further introduced in Chapter 9.

The theoretical approaches are based on both dialectical and *hetuvidya* logical approaches. The dialectical approach was established in parallel achievement by scholars in

three ancient countries. The earliest was Fushi (4498 B.C.) in China, the second was Shakyamuni (563-483 B.C.) in India, and the third was Plato (428-348 B.C.) in Greece. This approach was further developed by Nagarjuna (ca 150-250) in India, Seng-Chao (384-414) and Chi-Tsang (549-623) in China, and Kant (1724-1804) and Hegel (1770-1831) in Germany.

The *Hetuvidya* logic approach was first developed by a philosopher, Aksapada (or Gautama), of the *Nyaya* school (not a Buddhist school) in India, and further developed by some Buddhist scholars, mainly by Arya Dignaga (450-520) of *Vijnanamatra* school. This approach is, in some extent, correspondingly similar to that of Aristotle's syllogistic logic.

Needham (1969, p.423) gave the following high evaluation about ancient Indian logic:

The Buddhist (and other Indian) theoretical systems were often at least as subtle as the great philosophies of Europe, and very few have yet received the attention of modern logicians armed with all the aids which mathematical symbolism now provides. Buddhist logic (pramana) was not Aristotelian, and its theories of knowledge were not the same as the epistemology of Kant or Locke. But in the present context the most important point is that there were Indian schools not only of formal, but also of dialectical logic, and that China received some at least of the teaching of both of these.

The two main uses of these approaches for Buddhists are first for individuals to attain enlightenment, the second is to help others to get it too. In the process of helping others, it is necessary to criticize other or opposite theories, such as dogmatism and rationalism, which maintain definite views about reality. They also hold incorrect views of causality, by which one cannot achieve an enlightened state. To convince those who hold these incorrect views to deny them and to accept correct theories.

Shakyamuni and his followers developed both the theories and approaches of dialectics and *hetuvidya*, which all require special debating skill. It is noted that there is a characteristic for Shakyamuni's Buddhist theory, namely, a theory always accompanying a relevant approach. In this chapter, theories and approaches of dialectics and *hetuvidya* are introduced.

II. The Theory of Dialectics or Dialectical Logic Approach

I. Definition

The general meaning of the word "dialectic" or "dialectics" was used in ancient time as a kind of debating and inferring skill. The purpose was to convince opponents and to make truth clear. In Buddhism, there is a special meaning and purpose to this approach by which one continuously negates the false or relative phenomena / relative truth and transcendently affirms the ultimate domain / absolute truth of the universe and life. This leads to synthesize of relative phenomena / relative truth with ultimate absolute domain / absolute truth, which is considered truly objective and possessing great power and functions in the universe and of life.

According to Singh (1989), " In plain words, dialectic is that movement of thought which, by examining the pros and cons of a question, brings about a clear consciousness of the antinomies by which Reason gets bogged up, and hints at a way out of the impasse by rising to a plane higher than Reason." Singh again defined in a somewhat different way that: (1) the word "antinomies" actually mean the "false or relative phenomena / Relative Truth" and the "ultimate absolute domain Absolute Truth; " and (2) "by rising to a plane higher than Reason" is equivalent to "synthesizing the relative phenomena / Relative Truth with the ultimate absolute domain / Absolute Truth together as oneness."

Singh, however, did not consider the important ideas of negation, affirmation, transcendence, and synthesis involved in the word dialectics. These ideas and the dialectical movement processes are emphasized here.

2. Origin and Development

2.1 Origin

Buddhist dialectics was established by Shakyamuni. During his first period of teaching, i.e. the *Bhava* or *Hinayana* period (according to the three period distinction), he used dialectic logical approaches in his four *Agama Sutras* and the *Maharatnakuta Sutra* to describe his view of *pratitya-samutpada* or conditioned-arising and dependent origination. For example, in the *Agama Sutra* (Abe, 1989, p.153 ; Yu, 1991, p. 84), he said:

If this is, that comes to be;
from the arising of this, that arises;
if this is not, that does not come to be;
from the ceasing of this, that ceases.

From this, a formula can be derived as follows:

Affirmative: If --- that --- from --- that ---

Negative: If not --- that does not --- from --- (--) that --- (--)

During the second period (or the first period of *Mahayana*) of teaching, i.e. the *Sunya* or *Prajna* period, Shakyamuni in his *Prajna Paramita Sutras*, developed another type of dialectics. For example, in the *Diamond Sutra* he repeatedly used the following formula:

So-called ----- is not ----- so it is called -----

Thus, Shakyamuni said: " So-called all dharmas (things) are not all dharmas (things), so they are called all dharmas." (Price & Wong, 1990, p.38; with some changes).

2.2 First Development in India

About seven hundred years after Shakyamuni (at the early stage of the 2nd century), this dialectical approach was further developed by Nagarjuna, the fourteenth patriarch of Zen, the main founder of *Mahayana* Buddhism, and the founder of the *Madhyamika* school. Nagarjuna developed this principally in his *Mahaprajna-paramita Sastra* and especially in the *Madhyamika Sastra*.

At the beginning of the *Madhyamika Sastra*, Nagarjuna first stated his famous "Eight No" formula, to express his dialectical view (*The Buddhist Tripitaka* Vol. 37, p.45, 1985; according to Stcherbatsky's translation, 1989, p.77).

There is nothing arising,
Nor anything ceases;
There is nothing eternal,
Nor anything discontinues;
There is nothing unifying,
Nor anything differentiates;
Nothing moves,
Neither hither nor thither.

This "Nothing ----- Nor Anything" formula was established the view of *Madhyamika* dialectics.

2.3 Further Development in China

After Nagarjuna's *Madhyamika Sastra* and several other sastras were introduced into China and translated by Kumarajiva in 409, Nagarjuna's original *Madhyamika* school was reformed and called the "Three-Sastra school." *Madhyamika* dialectics was integrated with Chinese indigenous Taoist dialectics. This dialectical method developed quickly in China. Needham (1969, p.424) stated as follows:

The Madhyamika-sastra was first translated into Chinese by Kumarajiva in + 409 as the *Chung Lun* (Discourse on the Middle Way). It reached the peak of its influence just about two centuries later, with the famous commentary written by Chi-Tsang (the *Chung Lun Su*). One of the first Chinese to expound this dialectical logic was the monk Seng-Chao (+ 384 to + 414), a pupil of Kumarajiva's, and a thinker who had deeply studied the writings of the Taoist fathers. His *Chao Lun* (Discourses of Brother Chao) exemplified the Middle Way (*Chung Tao*) as understood in his time by a series of antitheses and syntheses. All things exist (*yu*) in one sense, but in another they do not (*fei*); neither assertion is ultimately justified, and really there is neither being nor non-being (*pu chen khung*). Again, things seem to move (*tung*) or to remain at rest (*ching*), but really there is neither movement nor quiescence in the ordinary sense (*pu chhien*).

As Needham said, Seng-Chao was a pupil of Kumarajiva and one of the first Chinese to expound Nagarjuna's dialectical logic, and also was the major founder of the Three-Sastra school. About two centuries later, on the basis of Seng-Chao's *Chao Lun* (*Chao's Sastra*) and *Chung Lun Su* (the *Explanation on the Madhyamika Sastra*), Chi-Tsang wrote the *Abstruse Meaning of the Three-Sastra*, and the *Explanation of the Madhyamika Sastra*. Thus, he developed a neo-Three-Sastra school in South-East China (Wang, 1978, p. 12). Chi-Tsang also wrote another famous book, *Essay on the Theory of the Double Truth*, to further elaborate and systematize Nagarjuna's and Seng-Chao's dialectical logic of contradiction. Needham said:

The logic of contradiction was greatly elaborated and systematized by Chi-Tsang (+549 to +623) with his *Erh Ti Chang* (Essay on the theory of the Double Truth). His teacher, Fa-Lang, had distinguished between mundane truth (*shih*) and absolute truth (*chen*). The highest level of truth was to be reached through a succession of negations of negations until nothing remained to be either affirmed or denied (*ibid*).

Following this, after Buddhism went to China, two new schools were developed, i.e. the T'ien-Tai and the Hsu-Yen. On the basis of the dialectics of the Three-Sastra school, it was further developed and more elaborated by Chih-I, the founder of the T'ien-Tai school, and Tu-Shun as well as Fa-Tsang, the founders of the Hsu-Yen school (Chou, 1978).

Buddhist dialectics was systematized completely and perfectly by the Hsu-Yen school and almost attained the pinnacle of this approach. Here, a brief description is introduced.

3. Characteristics and Processes

3.1 Internal Opposition of Contradiction

This is the first characteristic of Buddhist dialectics, in which everything, including the animate and the inanimate, the mental and the physical, has an internal opposition from a contradiction. For instances, the process of life includes both birth and death, being comprises ceasing, formation comprises destruction, possessing comprises not having, big comprises small, height comprises low, short comprises long, many comprises less, far comprises near, good comprises bad, happy comprises sad, enjoying comprises suffering, fortune comprises misfortune, and moving comprises resting.

3.2 Causal-Relation and Dependent-Origination

This is the second characteristic, in which everything arises from a causal origin and then exists in a dependent relationship. There is not any thing which does not arise from a causal origin and does not exist in a dependent relationship. This includes both the animate and the inanimate, the physical and the mental world. These situations are further discussed in considering *the law of cause and effect* and *the law of conditioned-arising and its emptiness-nature*.

3.3 Motivation and Dynamics

In this third characteristic, everything is considered to be in motion without cease, existing in a dynamic state. Resting is only a temporary slow movement, and moving is only an external feature of things. The exact nature of movement is between internal contradictions,

and the exact nature of these contradiction is that of the contradiction of cause and effect. The dynamic power behind the movement of contradictions is karma-force, which is discussed later in the chapter of *the theory of Karma-force (bija) and retribution of life*.

3.4 Quantitative, Qualitative Changes and Development

In the fourth characteristic of Buddhist dialectics, the movement of internal contradictions of things is expressed in two features, the quantitative and the qualitative. Quantitative change describes individual changes of a small amount or degrees, visible or invisible. Qualitative change refers to the process of the movement and change of internal contradictions. Small changes accumulate gradually and when the accumulation of these small changes reaches a certain point, suddenly there occurs a significant and obvious change. Quantitative and qualitative changes, however, only have relative meaning according to one's ability to distinguish them. This process of changing is called development.

3.5 Negation and Conversion of Contradictions

The fifth characteristic of Buddhist dialectics considers the nature of development as a process of mutual negation and conversion of internal contradictions. For example, with the beginning of life, at birth, there spontaneously exists its opposite, or contradiction, namely death. The development of an individual after birth is a process of mutual negation and opposition by the factors of death. Thus, individual development is a process of negation in which the factors of birth are opposed and finally converted by the factors of death. Here, death represents the newer side of contradiction, and birth represents the older side of

contradiction. The factors of death, from weaker to stronger, negate the factors of birth, from stronger to weaker, respectively and successively. Once all of the factors of birth are converted into and replaced by the factors of death, then an individual, born before, has died. This process still exists in the relative pheno-world and only reflects relative-truth.

3.6 Negation of Negation and Transcendence

This sixth characteristic of Buddhist dialectics deals with the process of the negation of the previous processes, that of the negation and conversion of contradictions. Because, according to the second, third and fourth characteristics of Buddhist dialectics, all things and beings existing are conditioned-arising and dependent-origination, and they are all in a state of change and movement. All these states are relative or “false”, therefore, one should not get attached to them. It is necessary to negate them in order to gain entry into the absolute noumo-world and reach at the highest Absolute-Truth. As Needham (1969) said: “ The highest level of truth was to be reached through a succession of negations of negations until nothing remained to be either affirmed or denied” (p.424). This step is actually a final affirmation by negation of negation.

According to Chou (1978), there are ten kinds of transcendental contradictions: (i) noumenon and function, (ii) form and phenomenon, (iii) subject and object, (iv) beingness and non-beingness, (v) wisdom and knowledge, (vi) language and speech, (vii) time and space, (viii) quiet and motion, (ix) everyman and sage, and finally (x) birth and death. If one can transcend all of these ten pairs of contradictions, one may attain the absolute truth realm.

Thus, according to this, the dialectic searching process is not endless, but stops when nothing further can be phenotypically distinguished.

3.7 Perfect Harmony of Negation and Affirmation

This is the final characteristic of Buddhist dialectics. When the process of the negation of all false or relative things and the negation of the negation and conversion of contradictions has been completed, and the highest level of absolute-truth has been reached, both negation and affirmation must be put in the situation of perfect harmony. This is negation and not negation; this is affirmation and not affirmation.

4. Patterns and Structures

The original pattern and structure of Indian dialectics was relatively simple. After the dialectical method was introduced into China, however, new patterns and structures were established within the development of new schools, e.g. the Three-Sastra school, the T'ien-T'ai school, and the Hwau-Yen school. These schools made the patterns and structures of dialectics more complex and more complete. There are totally six patterns.

4.1 Double Truth Pattern

This is an original and basic one, and belongs to a dichotomous dialectical approach pattern. It means that all things and matter, both animate and inanimate, possess two opposed sets of possibilities, potentials, reasons, truths, or contradictions. In this way, if one infers one thing, one has to have a standpoint or direction to make a conclusion. Once a conclusion has been made, another opposite conclusion also now exists. An analogy is made to a mirror which always has two sides. One is bright taking an image of any thing, and the other is dark,

which can not take any image. The former is named the positive or thesis, and the latter is called negative or antithesis. This idea has been incorporated in some Western philosophies, such as Hegel's, and these label a way as either positive or negative. Buddhism, however, is more specific.

According to Buddhism, all things in the universe can be systemized and synthesized into one of the two kinds: "beingness" and "possessingness", and their opposites are "notness", "nothingness" or "emptiness". It should be clarified that these relationships are not only in a common dyad of "yes" and "no", or "true" and "false". The negative side belongs to a transcendental negation, the negation of relative-truth, entering into an absolute-truth domain. This can be demonstrated in Table 20 (Chou, 1978, p.326).

Table 20 The Double Truth of Relative Truth and Absolute- or First-Truth

Positive	Negative
Beingness Possessingness Relative-Truth	Notness Nothingness or Emptiness Absolute- or First-Truth

As noted, this method was established by Shakyamuni, developed further by Nagarjuna in India, incorporating *madhyamika* ideas of the *Madhyamika* school, which was reformed and called the Three-Sastra school in China. Two further subtypes were developed: the mid-false- double-truth and the repeated-complex-double-truth. The former was mainly introduced as a *madhyamika* concept. Because its noumenon is *madhyamika* and its phenomenon is false, so it is called mid-false-double-truth. It has only one hierarchy with a positive-negative level. Because it is unsatisfactory for utilization in inference, the latter was established, which can repeatedly be used to infer to infinite hierarchies.

These two types of double-truth can be diagrammatically shown in Fig. 33 (Chou, 1978, p.327).

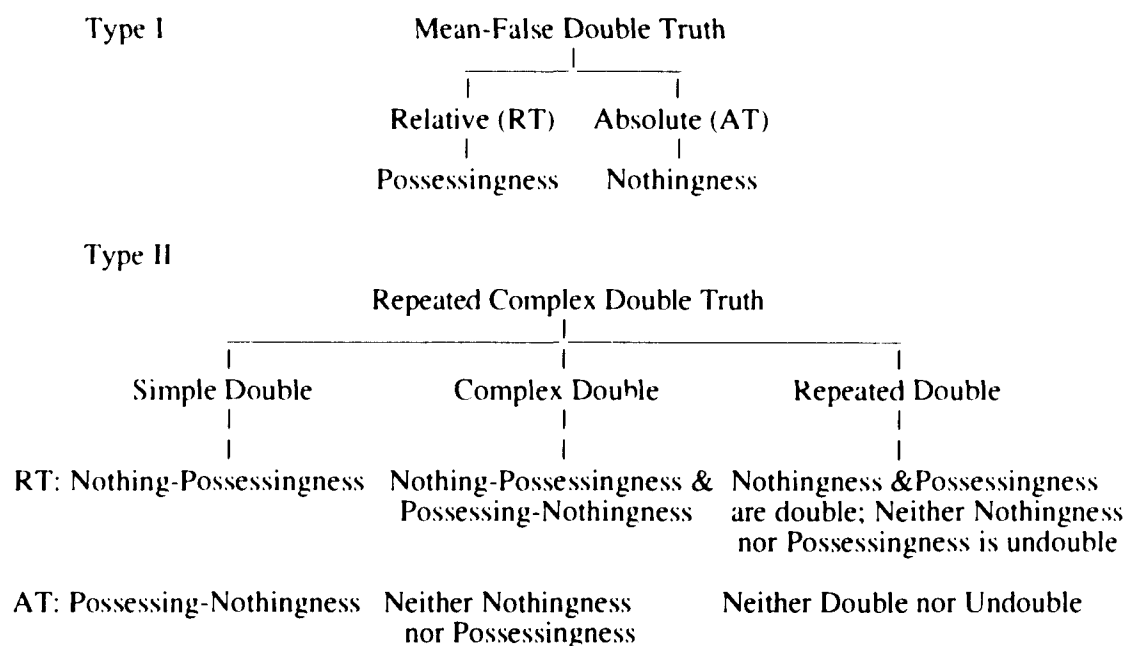


Fig. 33 Structure of Mean False Double-Truth and Repeated Complex Double-Truth

4.2 Triple-Truth Pattern

This pattern was established by the T'ian T'ai school in China. It is clear that in the relative pheno-world "Beingness" and "Possessingness" are easily understood by philosophers, scientists, artists, and politicians. Most, however, can not actually, thoroughly, and transcendently realize and deal with true nature and real noumenon of things and life. The concept of Buddhist triple-truth is an attainment to make the pheno-world ideas of "Beingness" and "Possessingness" thorough and capable of transcending into the absolute noumo-world.

Furthermore, it conceives of the transcendental absolute world first, after which it is relatively easy to deal with “Beingness” and “Possessingness” in the relative pheno-world. Thus, in the triple-truth concept, the antithesis is first and the thesis second, and the third one is “both”.

This can be shown in Fig.34 (Chou, 1978, p.328).

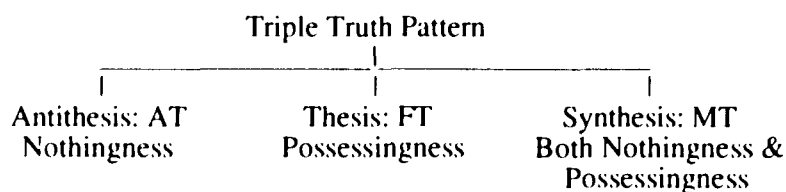


Fig. 34 Diagram of the Structure of the Triple-Truth Developed by T'ien T'ai school
Where AT means absolute-truth, FT means false-truth, and MT means mean-truth.

According to the T'ien T'ai school, if there are only two patterns of truth, the absolute and the false, they are not enough to infer and completely understand the truth of the universe and life. Furthermore, it holds that there are three other hierarchies of this Triple Truth: (i) The three truths can be kept separate, and this is called the Specific Form of Triple Truth, or Graduation. (ii) Each truth is composed of three truths, i.e. including the other two, and is called the Common Form of Triple Truth, or Suddenness. (iii) These three truths are always merging together and can never be separated, the unification emerges every moment and every place, and every activity of one's mind or consciousness is composed all of the three, antithesis, thesis, and synthesis. Thus, it is called the one-minded-triple-truth, or roundness- / perfect-harmony (Chou, 1978, p.328).

One might say that this dialectical system of thesis, antithesis, and synthesis seems similar to that of Hegel. It is true because Hegel's system was developed from this system, but there are also some differences between the two, which will be discussed in Chapter 15.

4.3 Four Alternatives or Tetra-Lemma or Catuskoti

This dialectical system was established and often used by both *Madhyamika* school and *Yogacara* school in India. The triple-truth is a continuing system, while this system is a four-standpoint / direction system; just as from four different directions, east and west, south and north, one enters into the center. Central to this belief is that there is only one, not four noumena for all things, just as a center does not differentiate into four directions, east, west, south and north. If we want to reach the noumenon of things, which transcend four-alternatives, or tetra-lemma, or *catuskoti*, we have to get entry into all the four directions. As in reaching the center of a city, transcending the four directions, entry must be gotten into all of the four gates of the city. The purpose of the tetra-lemma approach of Buddhist dialectics is to transcend the tetra-lemma and reach the noumenon of things.

The structure of the tetra-lemma can be shown in Fig.35 (Chou, 1978, p.329).

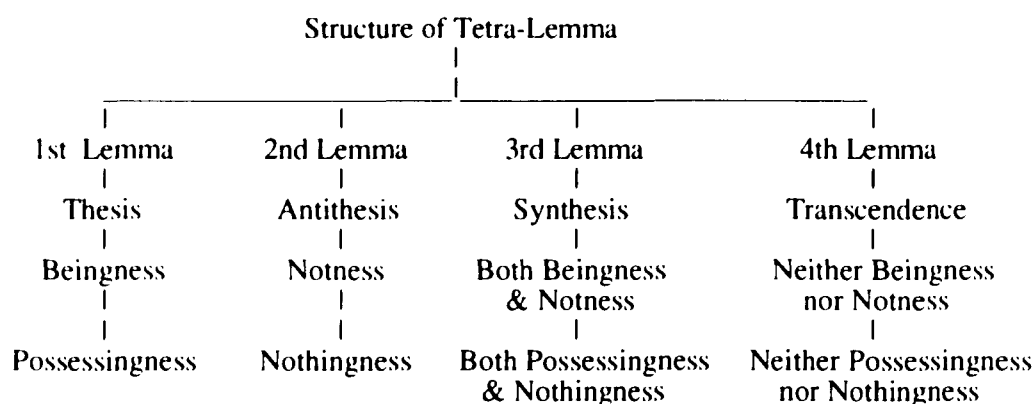


Fig. 35 Diagram of the Structure of Tetra-Lemma

4.4 Six Alternatives or Hexa-Lemma

This type of Buddhist dialectics was developed by the Hua-Yen school in China. This school was the latest established within Chinese Buddhism, and its dialectical inference approach is the most complete. The purpose of this is to overcome the problem that occurs if someone becomes attached to the tetra-lemma and can then realize the transcendental absolute-truth. The structure of the hexa-lemma is shown in Fig.36 (Chou,1978, pp.329-330).

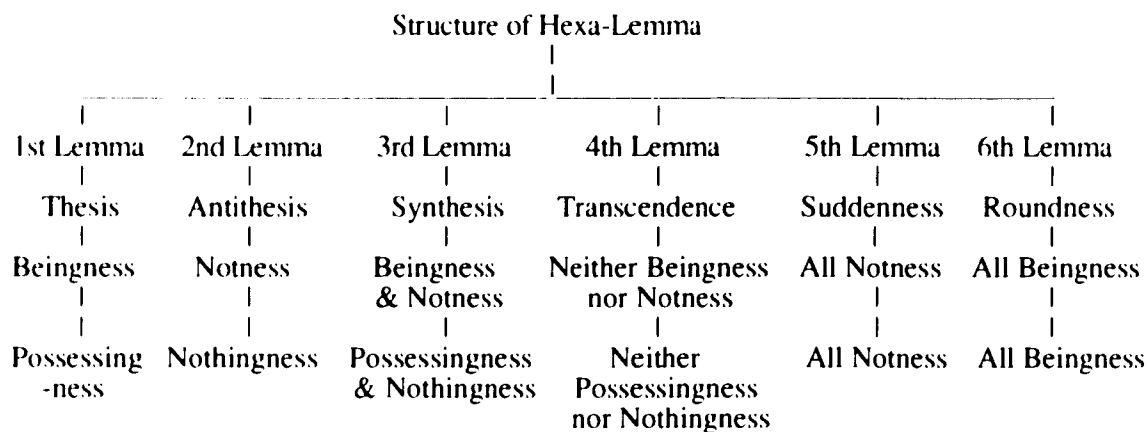


Fig. 36 Diagram of the Structure of Hexa-Lemma

The hexa-lemma was developed from the tetra-lemma by the addition of the 5th lemma, All Notness / All Notness, and the 6th lemma, All Beingness / All Beingness. This means that:

(1) The first four lemmas are Notness --- thoroughly denying everything and without any further attachment, and this allows attainment of absolute-truth domain.

(2) The first four lemmas are also Beingness --- finally affirming everything on the ground of the absolute-truth domain without further attachment, and lets one vividly use the absolute-truth to connect to the relative-truth domain. This is the highest realm of Hwau-Yen philosophy or *Mahayana* Buddhism. It is called "Roundness", transcendental, perfect, and completely harmonious between absolute-truth and relative-truth. This highest dialectical Buddhist realm is a concept which Hegel's dialectical realm did not reach.

4-5. Six-Forms

This pattern of Buddhist dialectical structure was also developed by the Hwau-Yen school. It deals with problem which no matter how many truths and lemmas are set up, one still may get attached to any of them. It needs to be demonstrated that the truths and lemmas are mutually connected systems, and for this, the six-forms were then established. They consist of the general-form, special-form, convergent-form, divergent-form, formative-form, and destructive-form. They are separately dealt with as follows:

(1) *General-Form::* This is a general form of any conclusion. It means a synthesized totality of many conclusions, for one thing, obtained from different standpoints and different tendencies.

(2) *Special-Form::* This is the special form for different conclusions concerning one thing. It means that conclusions obtained from different standpoints and different tendencies, have their own independent special nature.

(3) *Convergent-Form*:: This is the convergent form of different conclusions concerning one thing. It means that every conclusion, obtained from different standpoints and different tendencies, can all explain one thing.

(4) *Divergent-Form*:: This is the divergent form of different conclusions for one thing. It means that the conclusions, obtained from different standpoints and different tendencies, can only explain in different ways.

(5) *Formative-Form*:: This is the formative form of different conclusions for one thing. It means that a mutually connected concrete theory can be formed from many conclusions obtained from different standpoints and different tendencies.

(6) *Destructive-Form*:: This is the destructive form of different conclusions for one thing. It means that many different conclusions, obtained from different standpoints and tendencies, are mutually contradictory and destructive.

According to the Hua-Yen school, one has to realize the meanings of all “truth” and “lemmas” to reach the realm of merging and integrating the “six-forms” without separation, then one attains thorough enlightenment.

4.6 Ten-Abstruseness

Although the “six-forms” is relatively thorough enlightenment, it belongs to the “suddenness-gate” theory but not “roundness-gate” theory. The Hua-yen school further established the concept of “ten-abstruseness” to attain the “roundness-gate” theory. The “ten-abstruseness-gate” are mentioned as follows (Chow, 1978, pp. 331-333):

(1) *Simultaneous-Completing Correspondence Gate* : This means that all truth, all things, all lemmas and all dharmas simultaneously and completely appear without any deficiency. This is a general gate and the other nine gates are situations of simultaneous completing correspondence.

(2) *Broad-Narrow-Isvara Apratihata Gate*:: This means: (i) On the one hand, anything or any reason has its own unique definition which can not be mixed with others; this is called “Narrow”. (ii) On the other hand, however, the reason concerning one thing can be applied to all other things; this is called “Broad”. (iii) The application of these “Narrow” and “Broad” senses are *isvara apratihata* , i.e. independent, free and obstacleless. This is somewhat like the Western idea of isomorphism.

(3) *One-Multiple-Mutual-Allowing Different Gate*:: This means that any reason concerning one thing comprises all the reasons of all other things, and it is also comprised in all other things. This is somewhat like the Western idea of systems science.

(4) *Rough-Fine-Mutual-Allowing Safely-Established Gate*:: This means that any of the roughest thing and the finest reason comprise the largest things and the deepest reasons. This is somewhat like the Western idea of Salthe’s scalar hierarchy (cf. Chapter 14).

(5) *All-things-Phenomenal-Identity Isvara Gate*:: This means that on the one hand, any thing and any reason have no absolute individuality and are themselves all other things and other reasons; on the other hand, all other things and other reasons have also no absolute individualities and are themselves that thing and that reason. This is somewhat like the Western idea of dialectics.

(6) *Esoteric-Recessive-Exoteric Alternative-Formation Gate*:: This means that if only one thing and one reason are mentioned and become exoteric, then all other things and other reasons can not be expressed and become esoteric and recessive; on the other hand, if only other things and other reasons are mentioned and become exoteric, then that thing and that reason can not be expressed and become esoteric and recessive. This is somewhat like the Western idea of implication.

(7) *Causal-Mandala -Net Dharma-Realm Gate*:: This means that all things and reasons lay repeatedly and infinitely hold of other things and other reasons, just as there exists an infinite series of repeatedly manifold images produced in two mirrors set face to face. This is somewhat like the Western idea of chaos.

(8) *By-Things-Expressing-Dharma Producing-Understanding Gate*:: This means that according to the organizations of all things and reasons existed in the ways mentioned above (from the view of space) one can then naturally, randomly appoint any one thing or reason to know all other things and other reasons. This is somewhat like the Western idea of microcosm.

(9) *Ten-Generation-Separating-Dharma Differentiated-Formative Gate*:: This means that from the view of time all things and reasons must have a time sequence, the past, the present, and the future, so-called “Three-Generations”, and these cannot be skipped over, otherwise, things and reasons are all mixed up. However, the past can also be further divided into three generations, and the present and the future are as well. Thus, there become nine generations. Furthermore, the beginning and the ending are also mutual, repeated, and infinite in alternative circulation, which can also be called one generation. Therefore, there are a total of “Ten-Generations”. However, there is actually no beginning and no ending. This is somewhat like the essential continuity of stages in development.

(10) *Subject-Companion-Round-Bright Having-Morality Gate*:: This means that if any thing or any reason is looked on as a subject, then all the other things and reasons are its companion. This kind of relationship between subject and companion is eternally unchanged. This is somewhat like the relationships between part and whole.

One infers reasons by “ten-abstruseness”, one can attain the realms both of “*advaya* (non-duality) of things and reasons” and “*advaya* of things and things” as well as “*apratihata* (resistless) of things and reason” and “*apratihata* of things and things”. Thus, there is no further duality and no obstacles, and one finally reaches the realm of “roundness” or “perfect-harmony”.

III. The Theory of *Hetuvidya* /*Hetuvidya* Logical Approach

1. Definition

Hetuvidya is another Buddhist logical approach, reasoning or understanding cause. It is an inference-method of a “tristatement-formula”: the proposition, the cause or reasoning, and the example. This logical approach belongs to formal logic, somewhat similar to that of the Aristotelian syllogistic method, which will be compared later. This was used principally in the *Dharmalakṣaṇa* school and especially in the *Vidyamātrasiddhi Śāstra* . When one studies the *Dharmalakṣaṇa* school, one needs to use this method. Hence, these two function like a pair of wings of a bird or two wheels of a cart, neither of which can be missing.

2. Origination

Hetuvidya is attributed to Akasapada and was not created by Shakyamuni. This probably was a name for the philosopher Gautama, who was the founder of the school of *Hetuvidya* and the author of the *Hetuvidya Sastra* (one of the *Pancavidya Sastras*, a treatise explaining causality or the nature of truth and error). Later, Dignaga, a student of Vasubandha, developed Gautama's *Hetuvidya* logical method as a formal type of Buddhist logical method, which he did in his classical treatise, the *Nyayadvaratarka Sastra*. Then, Sankarasvamin, Dignaga's students, further developed this logical method with his important treatise, the *Nyayapravesa Sastra*. It was further developed in China by a very famous Chinese follower, Hsuan-Tsang, in his great synthetical treatise, the *Vidyamatrasiddhi Sastra*.

3. General Structure of the *Hetuvidya* Logical Approach

According to Sankarasvamin's system, from the *Nyayapravesa Sastra*, the science of *hetuvidya* is composed of the following parts (Tze-Hong, 1987, p.24):

3.1 Concerning the Enlightenment-of-Self

Concerning the Enlightenment-of-Self, there are four aspects:

(1) *True-Direct-Inference* means that the outside world is directly illuminated and realized by the pure wisdom of the pure mind, but not discriminated and recognized by the 6th consciousness, which always discriminates things and results in their reflections losing the original true faces / situations. In this type of realization, the knowledge obtained truly reflects the "original face" of the outside objective world.

(2) *True-Comparing-Inference* considers a comparison of the known and an inference of the unknown. This is also accomplished by the pure mind and pure wisdom but not by the 6th discriminating consciousness, which always makes things losing their “original face”. To accomplish this, one must apply the inference-process of the Tri-statement formula, which is described in detail in the next section.

(3) *Pseudo-Direct-Inference* means that the outside world is indirectly realized and discriminated by the 6th consciousness, but not by the pure mind and pure wisdom. In this type of realization, the knowledge obtained does not exactly reflect the “original face” of the outside objective world.

(4) *Pseudo-Comparing-Inference* means that a comparison of the known and an inference of the unknown are not accomplished by the pure mind and pure wisdom. Therefore, the knowledge thus obtained is not only indirect, but is also obscure and incorrect

3.2 Concerning the Enlightenment-of-Others

Concerning the Enlightenment-of-Others, there are also four aspects:

(1) *True-Capable-Establishment* means a true proposition, which is capable of being established due to its possession of a complete set of the Tristatement-Formula, without any fallacies for the establisher.

(2) *True-Capable-Destruction* means a true counter-proposition, which is capable of destruction, due to many fallacies and errors of the competing propositions.

(3) *Pseudo-Capable-Establishment* means a false proposition, which cannot be established due to its incomplete Tristatement-Formula, and it possesses many fallacies and errors for the establisher.

(4) *Pseudo-Capable-Destruction* means a false counter-proposition, which cannot be destroyed due to having no fallacies for the completer but only having errors, on the contrary, for the establisher.

The first two “true”s must be based on the “Enlightenment-of-self” of the establisher, otherwise the next two “pseudo”s will operate instead.

This Buddhist *hetuvidya* logical system is not only a regular logical system, and also an epistemological one, named “true-direct-inference method”. There is absent of this approach in Aristotelian syllogistic system.

3.3 Structure of the Comparing-Inference-Tristatement of *Hetuvidya*

The comparing-inference-tristatement is composed of three components, *Patijna*, *Hetu*, and *Udaharana*. The *Udaharana* is further divided into two, analogy and contrast. (1) *Patijna* means a proposition, or a main thesis in a comparing-inference-tristatement. (2) *Hetu* means a cause or a reason in a comparing-inference-tristatement. (3) *Udaharana* means an example: the analogy is a similar example and the contrast is an opposite example.

These can be shown in Table 21.

Table 21 The Structure of the Comparing-Inference-Tristatement of *Hetuvidya*

Procedure	System
(1) <i>Patijna</i> (Proposition)	Aluminum can conduct electricity
(2) <i>Hetu</i> (Cause)	Because aluminum is a metal
(3) <i>Udaharana</i> (Example)	
Analogy	As far as they are known up to date, other metals can also conduct electricity, e.g. copper
Contrast	As far as they are known up to date, those things which cannot conduct electricity are non-metals, e.g. glassware

From Table 21, it can be seen that this comparing-inference-tristatement formal logical system is relatively precise. The division of example into two seems more reasonable.

Chapter 9 Theory of Approaches to Enlightenment

I. Introduction

The final goal of both theoretical and practical Buddhist researches is to attain *nirvana* or enlightenment to recover one's own true-mind, and thus to get free from suffering in the six-ways of transmigration to reach real self-nature and true-life realm. To actually attain this goal, the most important thing is that there must be certain correct and efficient approaches.

Because Buddhism is not only a theoretical philosophy, but also a practical bioscience, a "superscience" / "metascience", or a "metabiology" as mentioned before; therefore, it is not enough to only theoretically understand the truths of the universe and life. Theoretical understanding is only a first step and one has to further understand by personal practice and verification. Thus, practice approaches are very important in Buddhist practice. Because, one can really understand Buddhist theories, when they are verified by one's own practice.

It has been pointed out in last chapter that because of different purposes, in Buddhism, there are two different divisions of approaches to attain the different hierarchies of *nirvana* and fruit-positions, the *Sravaka* and *pratyeka-buddha*, of *Hinayana* and the *Bodhisattva* and Buddha of *Mahayana*. The two different groups of approaches of the former, the five-*skandhas* and twelve-*nidanas*, have been introduced in Chapter 5; and one of the two groups of approaches (the theoretical and the practical) of the latter, the theoretical (dialectics and *hetuvidya*), has also been introduced in last chapter. In chapter 8, it has also briefly pointed out that there are many practical approaches in *Mahayana* to attain the relatively high hierarchy of *nirvana* and fruit-positions, the *Bodhisattva* and Buddha. In this chapter, the practical approaches are specifically introduced, and their classification is also demonstrated here.

1. The Classification of the Practical Approaches

All practical approaches can be classified according to the dichotomic rule. They can be firstly divided into two categories: the Sect and the Teaching. Then both of the Sect and the Teaching can be secondly divided into two, respectively: the Silent-Questioning and the Silent-Illumination and the Exoteric and the Esoteric (or Tantric). Finally, both of the Exoteric and the Esoteric (or Tantric) can be again dichotomically divided into the Silent-Observing and the Chanting or Reciting, respectively. These are diagrammatically shown in Fig. 37.

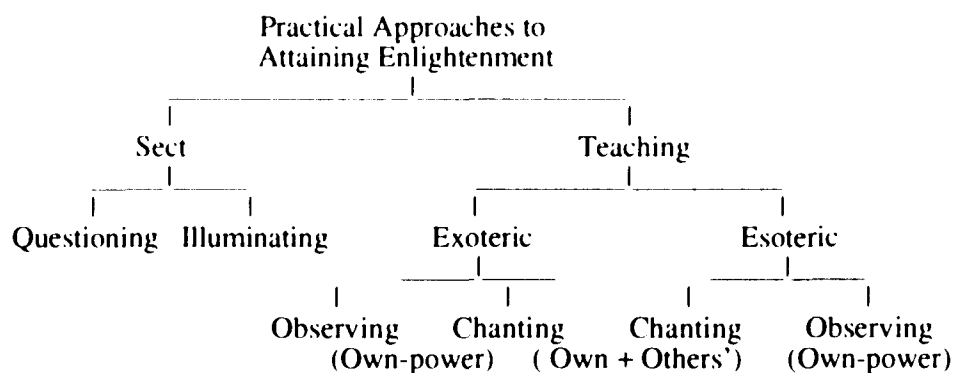


Fig. 37 The Classification of Methods for the Attainment of *Nirvana*

In Fig.37, one thing needs to further note that, in practical approaches besides the dichotomous situations pointed out above, there is another important dichotomous situation concerning the origination of the power in practice for enlightenment. The dichotomic types of enlightening power originations are: (1) by one's own-power, (2) by one's own-power plus other's (that of Buddhas' and Bodhisattvas'). Fig.37 also shows that all chanting approaches are by one's own-power plus others' and the others are all by one's own-power.

2. Analysis of the Entrances of Different Practical Approaches

The purposes and theoretical bases of Buddhist practice were explicated deeply and scientifically in the *Surangama Sutra* or *Leng Yen Ching* (Luk, tr., 1966), the *Lotus Sutra* or *Dharma Flower Sutra*, or *Saddharma Pundarika Sutra* (Niwano, tr., 1980), and the *Flower Ornament Scripture* or *Avatamsaka Sutra* or *Hua Yen Ching* (Cleary, tr., 1984). In these, the true-life / true-mind of a human individual is considered to be deluded by and composed of the five *skandhas*, eight consciousnesses, and twelve-*nidanas*. (Luk, tr., 1966, p.101-127).

Of many practical approaches in *Mahayana* Buddhism mentioned and classified above, twenty-five main approaches, as introduced in the *Surangama Sutra*, were stated by twenty-five *Bodhisattvas* and *Arhats*, based on their own practice experiences and according to the different entrances of practice (ibid). These approaches actually represent twenty-five different entries to true-life-mind. They can be divided into five groups, as shown in Table 22.

Table 22 Classification of Twenty-Five Approaches of Entry to the True-Life-Mind

Groups	1	2	3	4	5
	6-Environment	6-Root	6-Consciousness	5-Element	2-Others
Entries	Color & Form Sound Smell Taste State of Things Dharma	Eye Ear Nose Tongue Body Brain	Eye (sight) Ear (hearing) Nose (smelling) Tongue (tasting) Body (touching) 6th-Consciousness	Earth Water Fire Air Empty	8th-Consciousness Chanting (hearing of sound)

In Table 22, although there are twenty-five approaches of entry, only six are basic, i.e. the 6-roots or 6-consciousnesses. According to the *Surangama Sutra*, the most emphasized is that of ear (hearing). In other words, the most effective entry into the true-mind-life is sound through ear, into the 6th-, 7th-, and 8th-consciousnesses.

In general, the theoretical basis of these approaches is to reduce the false-mind from one of the five-sensations to the 6th-, 7th-, 8th-consciousness, and finally to the true-mind / true-life. It is based on the use of an ability or power that is inherent within an individual, comes from their own actions and self-nature, and is not induced by a power or force from without. In other words, the theoretical basis of any approach is to wipe out or clean up obstacles, and to recover the original true-life-mind. The differences between different approaches lie only in their different starting points

According to the classification of Fig. 9-1, the practical approaches to enlightenment can be further summarized into two primary groups, the sect and the teaching. Based on these two groups, they have been developed into two theories: the sudden (based on sect) and the gradual (based on teaching) enlightenment. It is now to introduce some relatively important approaches of these two theories in the following.

II. The Theory of Gradual Enlightenment (Teaching-Gate)

It has been pointed out that the final goal of the Buddhist practice is to attain Enlightenment. Therefore, there is a characteristic of Buddhist theories that each of them includes certain approach(es) to practice and centers how to finally attain enlightenment.

I. Definition

Shakyamuni taught his theories totally for forty-nine years after his attainment of the unexcelled complete enlightenment. All of these teachings, including both theories and practical approaches, were made orally, and after his *nirvana*, his students and followers made his teachings into written form by human languages. Both of these oral and written teachings are called teaching-gate, which teaches people by using certain approaches to gradually attain enlightenment and so takes relatively longer time.

There are four basic characteristics of teaching-gate practical approaches:

(1) From the view point of form, because the basic characteristic of teaching-gate is in the form of speech and language, so it is the first characteristic of its practical approaches.

(2) From the viewpoint of inner or outer and mental (mind) or physical, these approaches relatively emphasize the outer and physical issues; and so they are relatively difficult to remove the ignorance or two kinds of attachments and other two kinds of barriers.

(3) From the viewpoint of the promotion of retribution-positions, these approaches are

generally promoted step by step, and so their speed of progress also become relatively slower and the attainment of the final unexcelled complete enlightenment need relatively longer time.

(4) From the viewpoint of the efficiency or the speed of enlightenment, according to the above three situations, these approaches express both on the efficiency and speed all being lower and slower than that of sudden enlightenment approaches.

2. Exoteric-Teaching Approaches

2.1 Approaches by Personal-Power: Intuitive-Observing Methods

The intuitive-observing methods belonging mainly to exoteric-teaching, are generally practiced by sitting, sometimes by walking, silently and intuitively, to observe and illuminate one's true-mind with one's own wisdom by leaving or converting all of one's consciousnesses.

There are many intuitive-observing method. A most popular one is called ceasing-observing (or Chih-Kuan) method, which was established by Chih-I (538-597), the founder of the T'ien-T'ai school. Of the several types of this method, a relatively easy and general one is called the "six-mystic" method. It is based on putting one's physical body and all consciousnesses to rest, which is called "ceasing" or "Chih"; thereby penetrating through the false-mind or consciousnesses to contact with insight, one's own wisdom. Done intuitively and clearly, this is called "observing" or "Kuan". The relative details of this method are described as follows (Fang, et. al, eds., 1990, p. 371-379).

The six-mystic method describes six steps, by which to reach true-wisdom, -mind or -life, and are: counting, following, ceasing, observing, reducing, and purifying. The theoretical basis of this method is to begin by the aid of counting and following the breathing or

Chi (the latter means air, plus life-energy), to first concentrate and cease one's thinking. Next, the first five consciousnesses or senses and the 6th-consciousness are converted into perfecting-wisdom and profound-observing-wisdom, respectively. Then, one uses these to observe the true-mind and to convert the 7th-consciousness into universal-wisdom. Finally, one converts the 8th-consciousness into great-round-mirror (or perfect)-wisdom, and reduces it to true-mind / true-life.

There are ten different types of this method, but only the most common and easy one is introduced here. It is called the orderly and mutually produced six-mystic method. This method is practiced by going through one step after another, with movement from the former producing the latter. In addition, each step is divided into two substeps. The first is its practice and the second is its verification. Starting with the second step, each begins after the verification of the previous step. This method is a typical gradual-enlightenment method.

When beginning to practice the six-mystic steps, it is best to sit: (1) cross-legged (double-cross-legged, single cross-legged, or simply cross-legged, based on one's ability); (2) cross-handed (generally putting the left hand on the right for male, and *vice versa* for female); (3) keeping the back straight; (4) keeping the head parallel to and the sight vertical to the wall; (5) keeping the eyes slightly closed; (6) keeping the tongue touching the upper palate; (7) keeping every part of the body as naturally and relaxed as possible; and then (8) the most important thing is mentally to push away all thoughts, feeling, and sensations, i.e. keeping apart all ideas and sensations from the external world, and thus, concentrating one's mind.

Concrete practice and cultivation procedures are described as follows.

(1) *Counting* : The first stage is based on the cultivation of a counting practice. One first concentrates one's mind in counting and watching one's own breathing, carefully, unruffledly. One then repeats from one to ten in one way, or from one to ten and back from ten to one in two ways, going back and forth. Once the counting is interrupted by a thought,

feeling, or sensation, then one needs to go back immediately and start the counting again.

It is very important to note that one has to count slightly, naturally, clearly and not to use strong force, throughout all the steps. If one counts while watching one's breathing, the mind can not easily escape, because counting and watching are like two locks which fix the mind from escaping and continuing delusory tendencies.

The second stage is to verify that one has achieved the counting practice. When the practitioner can count from one to ten and / or from ten to one, easily, freely and proficiently, and feels that the mind is abiding on breathing so slightly and harmoniously that one no longer wants to count, then one can stop counting and enter into the next step.

(2) *Following* : The first stage, following-cultivation, is achieved by starting to concentrate one's mind to following and watching the breath, inhaling and exhaling, slightly, naturally, and unruffledly. One's mind abides on breathing, harmoniously and clearly.

The second stage is verification. When the practitioner in following breathing feels that: (i) it is so freely, slightly, and composedly that there is almost nothing except the breathing, (ii) it is seemingly not from the nose but from the surface of his whole body, (iii) the mind and breath depend on and combine with each other, and (iv) the continuing the practice too rough to continue it, he has then verified this step and can transfer to the next.

(3) *Ceasing* : The first stage, cultivation, occurs when one ceases counting and following breathing, and tries to keep one's mind in mindfulness and nonthoughtfulness.

Verification is achieved by the indication of the following feelings: (i) one's body and mind tranquilly entering into meditation (or concentration, or *samadhi*), (ii) one sees nothing of both one's inner and outer features, and (iii) his mind to be held by the power of the abstract, letting it naturally following its own course. At this point, the practitioner should recognize that although this *samadhi* is non-active and peaceful, and that he is happy and free

from worry, there is yet no wisdom and this stage does not stop the processes of birth and death. He also must recognize that this *samadhi* is unreal and illusory and it is a condition arising from both inner and outer causes. The practitioner should not hold on this stage, and needs further work to illuminate and eliminate it with wisdom. Then, he can enter into the next step.

(4) *Observing* : The stage of cultivation occurs when one stays the ceasing-mind stage focusing observation on the characteristics of slight breathing and on the inner organs, and distinguishing things with wisdom. This stage is achieved by the indications of: (i) very slight exhaling and inhaling of breathing seemingly like a gentle breeze in the sky.; (ii) the skin, flesh, bones, physique, and every inner organs being all like unsolid banana stems; (iii) feeling that the mind and / or consciousnesses are impermanent, not abiding, even for an instant; (iv) attaining the status of no self, others, or of the physical body, without mental activities, and altogether without self-nature; (v) because of the absence of self, things and others, resulting in noway and nowhere on which concentration can depend. These observations mainly focus on features of slight breathing and observing the inner organs of the physical body.

Verification occurs when the practitioner gradually notices the following: (i) His breathing, exhalations and inhalations, all pass through his hair-pores. (ii) His mind-eye suddenly opens and he sees all inner organs, even parasites living in them, all moving and changing every instant and never stopping. (iii) Things, both outside and inside, are seen to be very dirty. And (iv) while feeling extremely and transcendently happy, the fourfold invertedness of thought, i.e. suffering, impermanentness, impersonality, and impurity, are negated or destroyed; and the fourfold objectivity of thought, i.e. permanentness, joyfulness, personality, and purity, are attained.

After these aspects of verification, the practitioner concentrates and conditions his mind

on them, and still makes distinctions about and disruptions to them, feeling that perceptions, ideas, and thoughts are still in a flowing state. Therefore, these are not yet actual real truths.

(5) *Reducing* : In stage of cultivation, one reduces his observing form to the origin of his mind (i.e. the false-mind, here it is equivalent to the 8th consciousnesses), and then further reduces his false-mind to the real origin of his true / pure mind. If one concentrates and conditions his mind on disrupted observing-forms, one can not realize the original true / pure mind.

Questions arise about how reach this, such as from where does the observing-mind arise. Does it come from the original observing-mind or from the non-observing-mind ? If it arises from the observing-mind, how can this be, because the observing-mind does not exist prior to the first three steps of counting, following, and ceasing. If it arises from the non-observing-mind, since this expresses itself in the phenomena of production and annihilation or non-production and non-annihilation. But if it is expressed in production and annihilation, then it can not make the observation. If it expresses itself in the non-production and non-annihilation, then there must be two minds existing in a parallel situation. Even if it expresses itself in both production and non-production, and / or non-production and non-annihilation, this does not help to realize the observing-mind.

It is important to recognize that the observing-mind does not produce itself, and that, without production, there is no existence. In this case, it is emptiness, and there is no observing-mind, because there is no observing-form. The extinction both of circumstance and knowledge is the most important function in the reduction of the false-mind to the true- / pure-mind.

Verification of reduction is characterized by the following: (i) The practitioner notices that his pure-mind-wisdom opens and develops. (ii) He also notices that this process does not need any power or force, appearing completely, naturally and automatically to negate and extinguish all levels of disruptive forms. And (iii) he recognizes that the wisdom obtained

belongs to “leaving-environmental-wisdom” but not yet to “non-environmental-wisdom”.

Because leaving-environmental-wisdom does not completely depart from two-side relativity, the practitioner must practice further to attain the perfect non-environmental-wisdom, and enters into the final step of practice.

(6) *Purifying* : In cultivation stage, one must realize that, in all the above five steps, the five *skandhas* (cf. Chapter 5) seem first to be impure, but secondly appear as actually pure, and finally no erroneous-thinking and false-discrimination arise. One also must develop the capacity to extinct the impurity of: (i) erroneous-thinking, (ii) false-discrimination, (iii) self-holding, and (iv) physical-things-holding.

Verification of purifying occurs when the practitioner attains the realm: where there is no erroneous-thinking and raising of false-discrimination; where one can keep one’s mind with its original purity and reach a state that is neither subjective nor objective and is neither pure nor impure. Here, suddenly, his pure-mind integrates and unites resistlessly with his pure-wisdom (namely, the passionless- or vexationless-wisdom); and his *samadhi* opens, develops, and follows its own course, and finally his pure-mind depends upon nothing. There are two levels of verification of pure-wisdom: the lower is that of pseudo-passionless-wisdom, and the higher is called true-passionless-wisdom. Only when a practitioner achieves and verifies the latter, can he get outside the stream of the six ways of transmigratory suffering. Only when the practitioner reaches such high attainment, then it can be said that he has achieved the verification of purifying.

In general, the process of observation of the emptiness of sentient beings is called observing, that of things and entities is called reduction, and that of equality is called purity. In addition, all external observations are called observing; all internal ones are called reduction; and all neither external nor internal ones are called purity.

On the whole, the first three steps, counting, following, and ceasing are the cultivation

bases of the whole practicing process; the fourth step, observing, is a bridge, the turning-point; the fifth step, reducing, is a key step; and the final step, purifying, is the final goal. Furthermore, the first five steps are cultivation causes, and the last one is a final fruit.

In Buddhism, almost every school has its own method of intuitive-observation. For example, there are different kinds of Fivefold Intuitive-Observation methods in both the *Dharmalaksana* and the Hwau-Yen schools. However, they are not described herein in detail.

2.2 Approaches by Personal-Power-Plus-Other's: Chanting Methods

The chanting method of exoteric teaching is mainly practiced in the *Sukhavati* or Pure-Land school. The theoretical basis of this method is, on one's own mind power, with additional power from faith in Amitabha Buddha. According to the belief of this school, other methods, even the esoteric, do not free practitioners from the six-way transmigration until they attain enlightenment and obtain the vexationless-wisdom. This method, by the aid of Amitabha Buddha's faithful added power, can bring practitioners with their impurified vexations and / or impurities into the Amitabha Buddha's pure land, to continue purifying their mind and find final enlightenment. This is the most popular approach up to now.

This method is easy to practice, by chanting Amitabha Buddha's name, without regard to postures. It can be done anywhere and anytime, and chanted loudly or silently. One can also chant by the aid of a ring of beads to count numbers, by which one can concentrate one's mind on the one point, of chanting Buddha's name.

The theoretical basis of this type of chanting method, besides obtaining the additional power of Buddha, is to reduce consciousnesses into the pure mind by one's own power.

3. Esoteric-Teaching Approaches

3.1 Approaches by Personal-Power: Observing Approaches

In Buddhism, every Buddha has a threefold nature of body, namely: the *dharmakaya* or dharma body, the *sambhogakaya* or reward body, and the *nirmanakaya* or miraculous / transformative body. The teachings of Shakyamuni (the miraculous / transformative body), written in many sutras by a worldly language, are called exoteric-teachings. The mystic great dharmas, namely *Dharani* / *mantra* or True-Word directly taught by *Rocana* or *Vairocana* (the names of the reward and dharma body of Shakyamuni, respectively), are called esoteric-teachings.

These teachings are not expressed in common meanings of this world, and are not translatable into human language, and thus, are not understandable. In general, they are considered to be more practical than theoretical. In esoteric-teachings, the name of Shakyamuni's dharma-body is specially called *Dhyani* -Buddha or the Great-Sun-*Tathagata* , allegorically referring to a series of the sun light pervading everywhere (Jiang, 1989, Vol. 2, pp.75-84).

The esoteric approaches by personal-power is basically similar to that of the exoteric mainly practiced by intuitive-observing. However, there are differences between the two: that of the exoteric is relatively emphasis observing the mind, and that of the esoteric is relatively emphasis observing the images of certain Buddhas and *Bodhisattvas*, some specific words or self-bodily-organs. These approaches are not emphasized here and are not introduced in details.

3.2 Approaches by Personal-Power-plus-Other's: Chanting Methods

Because the practical methods of the Esoteric-teaching specially emphasize added strength or power derived from Buddhas and *Bodhisattvas*, they specifically emphasize a special projection of modes or styles of external conditions and tools. This special kind of projection is called a *mandala* , namely, a plot or place of enlightenment / a round or square altar on which some specific Buddhas, *Bodhisattvas*, and instruments are placed. However, the practitioner's own personal power is still the basic vehicle for his success.

The theoretical bases of esoteric practice methods give one access to the power of one's own true-mind or dharma-body or Buddha-nature so that one can also get responses from the power of Buddhas and *Bodhisattvas*. The dharma-bodies of Buddhas and *Bodhisattvas* are like sunlight pervading everywhere, and their tremendous powers can respond to anyone who opens their mind to them and wants to get their help.

There are many different types of esoteric practice methods, however, only a few principles will be outlined here, without great detail. The basic principle for all esoteric approaches is to keep practitioner's body, mouth (i.e. voice), and mind in the mystic status (called three-mysticness) and get the added power from the *Tathagata* 's (Buddha's) three-mysticness within a specific *mandala* .

According to Esoteric-Buddhism, the three-mysticness of *Tathagata* is universal, namely, all things being this mystic body of *Tathagata* , all sounds being this mystic voice of *Tathagata* , and all thoughts being this mystic mind of *Tathagata* . All the bodies, voices, and minds of creatures in the universe are only individualized parts of the *Tathagata*, while illusion hides their *Tathagata* nature from them.

Therefore, esoteric practice seeks and realizes one's *Tathagata* nature by physical signs and postures. This could be certain finger-print seals or *mudras* of the body, voicing or

chanting the *dharaṇi*, and by mental-projections or intuitive-observing of certain Buddha's image in the mind. By these physical signs and postures, the practitioner places his three-mysticness, i.e. the hand, mouth, and mind, in correspondence to the *Tathagata*'s three-mysticness. He hopes to get a response from the *Tathagata*'s added and higher power enter into a situation, named "He may enter me and I Him," which is the perfection of great accomplishment or enlightenment.

III. The Theory of Sudden Enlightenment (Sect-Gate or Zen)

It has been already introduced and discussed that: (1) The two major *Hinayana* approaches of five-*skandhas* and twelve-*nidanas* are mainly used to attain the two retribution-positions of *Sravaka* (the highest one of the four subpositions is *Arhat*) and *Pratyekabuddha* respectively. (2) The two major *Mahayana* theoretical approaches (dialectic and *hetuvidya* logic) and one of the two major *Mahayana* practical gate-approaches (gradual-enlightenment) are mainly used to attain the other two retribution-positions of *Bodhisattva* and Buddha.

It is now that another major *Mahayana* practical gate-approach, sudden-enlightenment, which attains the retribution-positions of *Bodhisattva* and Buddha more directly, efficiently, and rapidly, is introduced and discussed here. This is the quintessence of the Buddhist approaches, both for *Hinayana* and *Mahayana*.

This approach is directly transmitted by Shakyamuni on a meeting just before his death, entry into *nirvana*. He demonstrated this approach and transmitted the highest Buddhist truth, absolute truth or true-mind / *bhutatathata*, only by a simple special action, raising a bunch of

flowers, without any talking. Many students could not understand what was this simple action meant besides one of his best students, Mahakasyapa, who responded also only with a simple action, a gentle smile, and also without any talking. Thus, Shakyamuni knew that Mahakasyapa had already suddenly enlightened the highest absolute truth of the universe and life; and then he transmitted this sudden-enlightenment approach to Mahakasyapa as the first patriarch to continue the transmission of this special approach and the Buddhist absolute truth.

Because this is a very special case, so this approach is called a “special transmission” or “mind to mind” method and is only applied to those persons who possess a special high quality of wisdom. This approach is also called sect-gate, as separated from teaching-gate.

One thing needs to emphasize here that the realization of the absolute truth is generally dependent on certain special approach. If there is without a certain approach, there will be unable to realize the absolute truth.

1. Definition

The term “sudden enlightenment” includes twofold aspects of meanings: (1) a special kind of approach, i.e. from mind to mind, (2) a special type of enlightenment, t.e. to understand, prove, and recover the real-self-nature, *bhutatathata*, true-mind / -life, or the absolute-truth / “original-face” of the universe and life, suddenly, instantly, and directly, apart from any consciousness but only by innate- / pure-wisdom.

Sect-gate approaches generally are also called Zen meditation or the dharma-gate of sudden enlightenment. Teaching-gate approaches were written in many sutras (taught by Shakyamuni Buddha) and sastras (taught by his followers, *Bodhisattvas*), however, sect-gate approaches, in restrict and original meaning, possess neither written language nor oral language, and are only expressed by certain appropriate actions varied according to different situations of different persons.

Therefore, the basic principle of this type of approaches is apart from both language and speech, and also from both false-mind and consciousnesses, and is only by teaching and transmission with the method or art of “ from (teacher's) mind to (student) mind”. Even some special actions (such as Shakyamuni's raising flowers) are only indirect expressions for convenience. This is determined by the nature of the teaching object, because it belongs to absolute-truth / domain and nothing can be talked or written, otherwise, all are wrong.

Thus, it must be noticed that both written and oral teachings and researches since Shakyamuni, including the present study, are all only for convenience. These teachings and / or researches are only like using finger to point the moon, and one can not look at the finger instead of the moon.

In this point, one can understand why before Shakyamuni entered into *nirvana*, he said that although he taught Buddhist theories for forty-nine years, he did not talk about even one word. In other words, he said nothing about *bhutatathata* or absolute truth itself, and all what he said is only like the finger but not the moon. The real moon, i.e. the absolute truth itself, can solely be seen or experienced by one's own pure-wisdom, but not by false-mind or consciousnesses; and it can not be talked by words or written by language.

However, this is only meant for absolute truth itself, but there still needs certain languages, sutras, such as *The Heart Sutra*, *The Diamond Sutra*, *The Platform Sutra*, for understanding and learning the meanings and approaches of absolute truth. It is only emphasized that to understand absolute truth is mainly by practice and own experience and there are no words and languages which can describe absolute truth itself because it is an absolute domain.

What is Zen? The term "Zen" was originated from the Japanese. The Japanese was translated from the Chinese "Ch'an", and the Chinese was translated from the Indian "*Dhyana*".

It means meditation or contemplation. According to this meaning, Zen is only a method of thinking. However, Zen also has a broader meaning, that is, in this case it also includes the meaning of goal, target, or objective which is hoped to be reached by the meditation.

Therefore, it can be said that Zen is a way of helping people to become enlightened about the nature of the true self and the nature of true universe. It can also be said that Zen is a system of purification, self-regulation, and self-control for the human mind. It is a way of liberating human life from suffering, so that, the former may enter the realm of *nirvana* or eternity (Dumoulin, 1987; Hirai, 1989).

In the broader sense, "Zen" can also mean "true mind", nothingness, absolute truth, or the vital reality of the universe. Ultimately, Zen can be realized through the unifying of both the mental world and the physical world.

2. The Theoretical Basis of Zen

The theoretical basis of these approaches is directly to recover one's true-mind / true-life through the reduction of one's false-mind or the eight consciousnesses. According to *the theory of wei-consciousness*, the cause of the opposition of enlightenment or unenlightenment is delusion, and the cause of delusion is ignorance. Furthermore, ignorance includes two attachments (ego and dharma-things) and two barriers (vexations and false-knowledge), which originate from and produced by both the 6th and 7th consciousnesses, especially the 7th being the root of the 6th. After understanding the causes of delusion / unenlightenment, one can then know the way (s) how to attain enlightenment.

The most important thing or the key to attain enlightenment is to remove the first obstacle, the ego-attachment, although it is not easy. To attain this efficiently and rapidly must have a best art. The best art is not the other kind of approaches but is that of the special type of

sudden enlightenment approach, Zen-meditation. After removing the ego-attachment, the vexation-barrier is correspondingly also removed, because there exists the cause-and-effect relationship between the two, i.e. the attachment being the cause and the barrier being the effect, or in other words, the attachment generating the barrier.

If one brings *Mahayana* purpose and practices *Mahayana* approaches, after removing the ego-attachment and the vexation-barrier, one can attain the first step of enlightenment and “jumping out” the three-worlds and the six-ways of transmigration to become a *Bodhisattva* but not yet a Buddha. Only when one removes the very fine, deep and unmatured seeds of dharma-things-attachment and false-knowledge-barrier recessively stored in the 8th-consciousness / *alayavijnana*, thoroughly, completely, and cleanly, then one can attain the *anuttara-samyak-sambodhi* or *anubodhi*, i.e. the unexcelled complete enlightenment, and become a Buddha.

One basic concept needs to point here that the word “remove” actually means “transform”, because, according to Buddhist theory or rule, nothing can be truly produced and also nothing can be truly eliminated. Every kind of forms, types or shapes, and all kinds of matter or mass can only be transformed from this to that but can not be really eliminated. This thing is produced, and that thing is destroyed; and this thing is destroyed, and that thing is produced again. It is the same for the mental factor, ignorance or the four kinds of attainments and barriers, which are originally transformed from true-mind / -life and innate- / pure-wisdom.

Therefore, the meaning and the theoretical bases of sudden enlightenment are: (1) focusing one’s attention inward and not allowing one’s mind / consciousnesses always going outward, (2) stopping one’s mental discrimination to remove one’s ego-attachment and vexation-barrier as deeply as possible from the 6th and 7th-consciousnesses, and (3) everywhere and every time to take attention, observation, and exploration of what being one’s self-nature, real-mind, true-life / true-self, or real-origin / original-face, transcendently and unconsciously.

The purposes for these are to transform the 6th-consciousness into the profound-observing-wisdom, and transform the 7th-consciousness into the universal-equalizing-wisdom to attain the primary enlightenment. And when the four kinds of attachments and barriers including their finest and unmatured seeds have all been removed, then finally the first five-consciousnesses can be transformed into the accomplishing-acting-wisdom and the 8th-consciousness can be also transformed into the great-round-mirror / perfect-wisdom. During this final stage, one then attain the unexcelled complete enlightenment and become a Buddha, i.e. a complete enlightened being.

The characteristics of sudden enlightenment approaches are: (1) enlightenment always comes suddenly, and (2) the efficiency is relatively higher. However, the sudden and higher efficiency of these approaches also requires relatively higher background.

3. The Patterns and Sects of Zen

3.1 The Patterns of Zen Approaches

Zen approaches are generally divided into two patterns: the Patriarch Zen and the Tathagata Zen. They are briefly described as follows.

(1) *Patriarch Zen*: The pattern which has been just mentioned above is generally called Patriarch Zen because it is transmitted personally by mind to mind, such as from Shakyamuni to Mahakasyapa who was the first Patriarch of Zen. Thus, Zen or Dharma was transmitted in such a way: from patriarch to patriarch, generation by generation. Until to 28th generation, the patriarch's name is called Bodhidharma and he transmitted Zen into China. Because when the

27th Patriarch transmitted Dharma to Bodhidharma, he told Bodhidharma that the Dharma starting from him had to be moved to the East into China (Zheng-Guo, 1989, p.27). Then, Bodhidharma was the 1st patriarch in China and he again transmitted Dharma to Hui-ko, the 2nd patriarch in that country. When the transmission up to the 6th, Patriarch Hui-Nen, was stopped because there were too many of successors.

(2) *Tathagata Zen*: This pattern actually belongs to the "teaching-gate", because its teaching totally depends on words, languages and sutras, such as T'ien-Tai school. It is called Zen because it emphasizes Zen-ting or samadhi. This is also different from Patriarch Zen which more emphasizes perfect wisdom and thorough enlightenment.

3.2 The Sects of Zen

Patriarch Zen in India originally only transmitted person to person, mind to mind, it was actually not established a school. It was only after transmitted to China, a very strong school was substantially established and broadly transmitted. Such as Bodhidharma, he not only transmitted his Dharma to Hui-Ko one person, but also he transmitted his Dharma to 13 other collateral lines (Zheng-Guo, 1989, pp.47-54). When the Dharma was transmitted to the 6th Patriarch Hui-Neng (Apx.12), he developed so many successors that he could only stop his personal transmission. Thus, after Hui-Nen, Zen in China was developed so rapidly and broadly, and two five-subschools and two sects were successively established. The first five subschools are Chingyuan, Nanyang, Nanyueh, Hotse, and Yungchia; and the second five-subschools are Kueiyang and Linchi (Rinzai), which were developed from Nanyueh, Tsaotung (Soto), Yunmen, and Fayen, which were developed from Chingyuan. The two sects are Yangchi and Huanglung, which were all developed from Linchi. Their genealogical developments are shown in Figs.38 and 39, respectively (Dumoulin, 1988, pp.327-336).

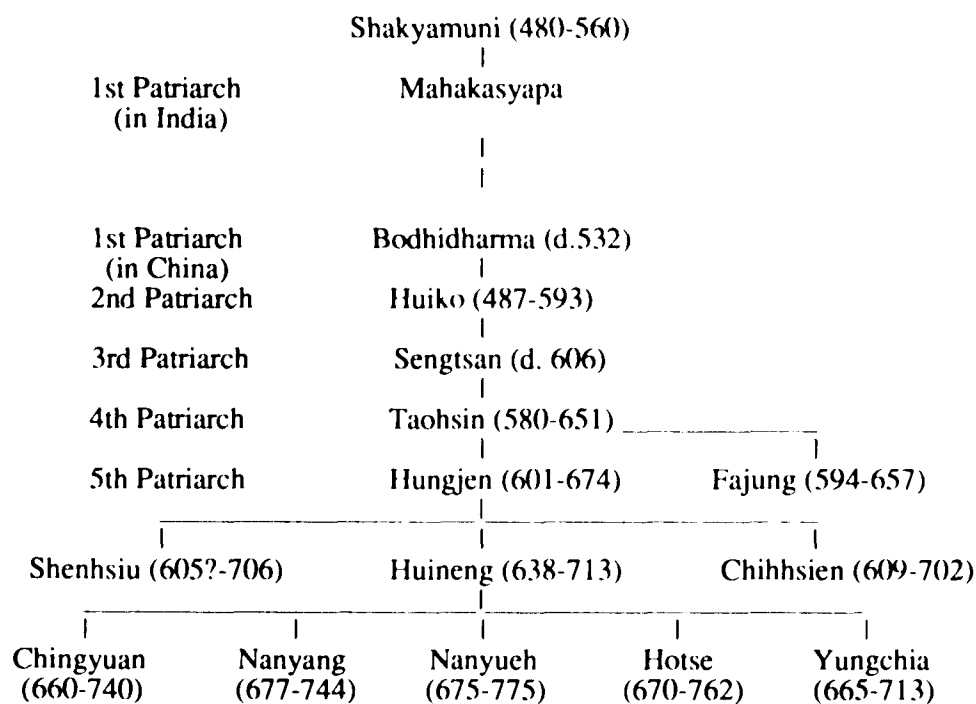


Fig. 38. The Lineage of the First Five-Subschools of Zen Development in China

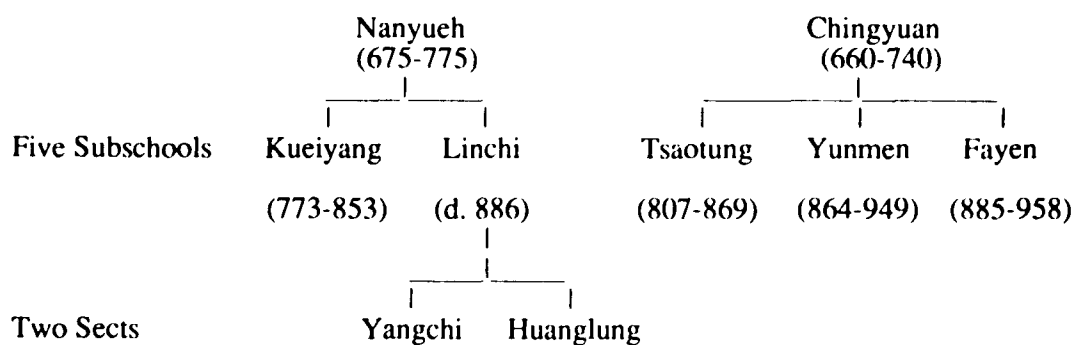


Fig. 39 The Lineage of the Second Five-Subschools and Two Sects of Zen

It is very interesting that, after the death (*nirvana*) of the 6th patriarch Hui-Neng, his flesh body could be preserved till now in Canton, China (Plate 3). Since then, many other enlightened Zen Master's flesh body could be also preserved permanently after death. Here are other two embalmed bodies still also preserved in China now (Plate 4).

Only Linchi (Rinzai) and Tsaotung (Soto) two subschools mentioned above were mainly preserved and transferred to Japan and Korea, and from there transferred to America in this Century. However, all of them were rebuilt by a modern long lived (one hundred and twenty years old, 1840-1959) enlightened Chinese Zen Master Xu-Yun (Plate 5, upper and lower right).

The approach of Linchi (Rinzai) subschool is now developed into the questioning method or *sanzen*, and that of Tsaotung into the illumination method or *zazen*. Modern Linchi-Ch'an, in China, was mainly represented by another enlightened Zen Master Lai-Guo (Plate 5, lower left).

4. The Patterns of Sudden (Zen) Enlightenment

What is "*Zen-enlightenment*" or "*satori*"? Is it merely a kind of illusion? Can it be expressed as a norm, or index, or measurement? *Zen-enlightenment* is not thought to be a kind of illusion. Although there is no physical measurement to express it, it is still possible to find some norm or index reflecting the differences before and after one's "enlightenment". This may be impossible to comprehend, if we only introduce examples from ancient Eastern experience. However, we can also introduce many modern instances, including the experience of some who are still living, some who are Western people, and some who are Americans.

Zen-enlightenment or *satori* is a certain result attained by a Zen meditator. It is a self-liberating experience which proves one's Buddha nature or true mind or the field of absolute noumenon. This can only be discussed indirectly and can never be talked about directly. It transcends one's consciousness and can only be felt by one's own direct perception. Enlightenment, or *satori*, or life liberation, always comes suddenly and gives the Zen meditator a sudden release (Dumoulin, 1987).

Although enlightenment always appears very suddenly, certain indications usually announce its approach. It is often elicited by some visual or an auditory sensation, such as the sound of the evening bell, the strokes of a clock, or even the rain pattering outside, and sometimes by a sudden whack of the master's stick---although at this stage the pain is hardly felt any more. All of these external stimuli act as catalysts for sudden enlightenment ---the sudden release of the true mind or the true life.

Now, several actual instances can be introduced in the following.

4.1 Enlightenment Appeared by Seeing " Eye to Eye "

The present Roshi Philip Kapleau of the Rochester Zen Center experienced his enlightenment appearing by seeing "eye to eye" with his Zen master during interview (Kapleau,1989). Some of Kapleau's daily experiences in his diary, while meditating with the Zen master, Yasutani-roshi, in Japan in 1958, were described as follows:

Aug. 5, 1958 : Didn't intend to tell roshi of my insight, but as soon as I came before him he demanded: ' What happened last night ? '----While I talked, his keen darting eyes X-rayed every inch of me, then slowly he began quizzing me: ' What do you see Mu (Mu means nothingness) ?How do you see Mu ?----When do you see Mu ?----How old is Mu ? ----How much does Mu weight ? ----- '.

Some of my answers came quickly, some haltingly. -----Once or twice roshi smiled. ----

Then he spoke: ' There are some roshi who might sanction such a tip-of-the-tongue taste as Kensho (means seeing Buddha's nature, same as enlightenment or satori), ----

I wouldn't accept sanction of such a picayune experience even if you wanted to grant it. Have I labored like a mountain these five years only to bring forth this mouse ? I'll go on !

Good ! I respect your spirit.

Threw myself into Mu for another nine hours with such utter absorption that I completely vanished---- I didn't eat breakfast, Mu did, ---- I didn't eat lunch, Mu ate.---- Once or twice ideas of satori started to rear their heads, but Mu promptly chopped them off, ----- .

Again and again the monitors whacked me, crying: ' Victory is yours if you don't relinquish your hold on Mu ! ' ----- .

Afternoon dokusan ! ---- Hawklike, the roshi scrutinized me as I entered his room, walked toward him, prostrated myself, and sat before him with my mind alert and exhilarated.

' The universe is one', he began to say, each word tearing into my mind like a bullet.' The moon of truth ---- . ' ----- All at once the roshi, the room, every single thing disappeared in dazzling stream of illumination and I felt myself bathed in a delicious, unspeakable delight. ---- For a fleeting eternity I was alone ---- I alone was ----. Then the roshi swam into view. Our eyes met and flowed into each other, and we burst out laughing. -----.

' I have it ! I have it ! There is nothing, absolute nothing. I am everything and everything is nothing! ' I exclaimed more to myself than to the roshi, and I got up and walked out. ----- .

I resumed my zazen, laughing, sobbing, and muttering to myself: ' It was before me all the time, yet it took me five years to see it ! '

4.2 Enlightenment Appeared Naturally with Some Indications

Mrs. D. Kapleau, the wife of Roshi P. Kapleau, experienced her enlightenment appearing naturally in a rohatsu session and with some indications occurred before its approach (Kapleau, 1989):

The following day, the seventh, I went before the roshi (Yasutani) at dokusan once more. From six or seven hours of continuous zazen I was so physically exhausted I could scarcely speak. Imperceptible my mind had slipped into a state of unearthly clarity and awareness. ' I know, I know I know.' I claimed. Then, gently roshi began to question me : ' What is the age of God ? Give me Mu! Show me Mu at the railway station! ' Now, my inner vision was completely in focus and I responded without hesitation to all his tests, after which the roshi, my husband (who interpreted) and I all laughed joyfully together.

Thus, I claimed: ' It's all so simple! '

Six years later. ---- The next morning, just after breakfast, I suddenly felt as though I were being struck by a bolt of lightening, and I began to tremble. All at once the whole trauma of my difficult birth flashed into my mind. ---- Tears gushed out mane so weakened me I had to lie down. Yet a deep happiness was there. ---- Slowly my focus changed: ' I am dead! There's nothing to call me! There never was a me! Its an allegory, a mental image, a pattern upon which nothing was ever modeled.' I grew dizzy with delight. Solid objects appeared as shadows, everything my eyes felt upon was radiantly beautiful.

These words can only hint at what was vividly revealed to me in the days that follows:

The word as apprehended by the senses is the least true (in the sense of complete), the least important in a vast ' geometry of existence ' of unspeakable profundity, whose rate of vibration, whose intensity and subtlety are beyond verbal description.

Looking into faces, I see something of the long chain of their past existence, and sometimes something of the future. The past ones recede behind the outer face like ever-finer tissues, yet are at the same time impregnated in it.

Words are cumbersome and primitive --- almost useless in trying to suggest the true multidimensional workings of an indescribably vast complex of dynamic force, to contact which one must abandon one's normal level of consciousness.

The physical world is an infinity of silence and voidness. Each object is thus transparent. Everything has its own special inner character, its own karma or ' life in time ', but at the same time there is no place where there is no emptiness, where one object does not flow into another.

4.3 Enlightenment Appeared by an Abbess's Sharp Blow on the Knee

On the seventh day of a session, the master asks one disciple during dokusan: " How is it with nothingness ?" " I don't know," replies the young man. " How is it with nothingness ?"

The master asks a second time and deals him a sharp blow on the knee. At this instant an

exclamation of enlightenment comes out of the disciple's mouth: " Suddenly I feel that it become bright. Oh, it is nothingness, this is nothingness, and that is nothingness! "

4.4 Enlightenment Appeared by an Abbess's Stick Touching the Tip of Nose

On other occasions, enlightenment appeared by an abbess's touching the tip of a disciple's nose with her stick. The unusual gesture suddenly elicits the liberating experience, which is expressed in cosmic terms (Dumoulin, 1987).

' I become one with the immense universe,' one woman disciple relates. ' Whether I turned my gaze upward or to the side, it expanded infinitely far, far. Finally I toppled over to the floor.'

4.5 Enlightenment Appeared Floodingly with Transcendental Light

To some who attained enlightenment, the world seemed to be flooded with transcendental light and, as it were, transfigured. Often there is a feeling of revitalization, a hovering lightness, and transparent brightness of the body. Zen disciples themselves pay little attention to such phenomena for their awareness is absorbed in cosmic nothingness. In this respect, the following account of a nun is typical (Dumoulin, 1987):

I had forgotten myself. Oh, this is it, this is it ! It is nothingness, it is nothingness ! Heaven and earth become bright in an instant, and my body has suddenly become light. I feel as if I could fly to the ends of heaven. All is nothingness, with hands folded I revere nothingness.

5. The Process of Sudden Enlightenment

5.1 The Theory of Wisdom-Root for Sudden Enlightenment

Wisdom-root means the background of the level of one's wisdom. According to Buddhism, because life continues through the three periods of life-times, i.e. past, present, and future, one attaining enlightenment in the present life-time must have certain level of wisdom-root cultivated in the past life-times. Buddhist or Zen practice in the present life-time is the continuation on the background of that of in the past.

Therefore, the suddenness of enlightenment is only a phenomenon, and behind it there is a process of practices and progresses in wisdom both in the present and the past. Thus, the depth of enlightenment differs among different individuals, because their situations of the background of the wisdom-root are different.

5.2 The Theory of Ten Steps of Sudden Enlightenment

Although sudden enlightenment means that enlightenment comes suddenly, this only indicates at the instantaneous point of enlightenment. However, the appearance of enlightenment is of a process and only the process is relatively shorter than that of the gradual-enlightenment. Because this process is very difficult to solely explained by the language, there were developed some pictures combined with certain poems to illustrate this process in the sixteenth century (the Sung Dynasty) in China.

There are two types of pictures: the five-picture series and the ten-picture series, and the most popular one is the latter, which is specifically called the "ten oxherding pictures". However, there are also several different types of this series of pictures, and according to Suzuki (1960, pp.127-135), there are at least four: (1) by Kaku-an, (2) by Seikyo, (3) by

Jitoku, and (4) by an unknown author. The most wide separated one is that of by Kaku-an, and is introduced here as in Fig.40 (after Sheng-Yen, 1988, pp.94-105).

This is a relatively general process. In fact, the steps of enlightenment differ from every individual, because the wisdom-root (-background) of every individual is different. In the ten-oxherding pictures, the ox represents the mind. Why is the ox used to represent the mind ? It is because the ancient Chinese Zen masters liked to use an “outdoors-dewed-white-ox” to represent the enlightened pure- / true-mind. Due to this, there is one type of the four, in which the ox at beginning is totally black and gradually changes into a totally white one.

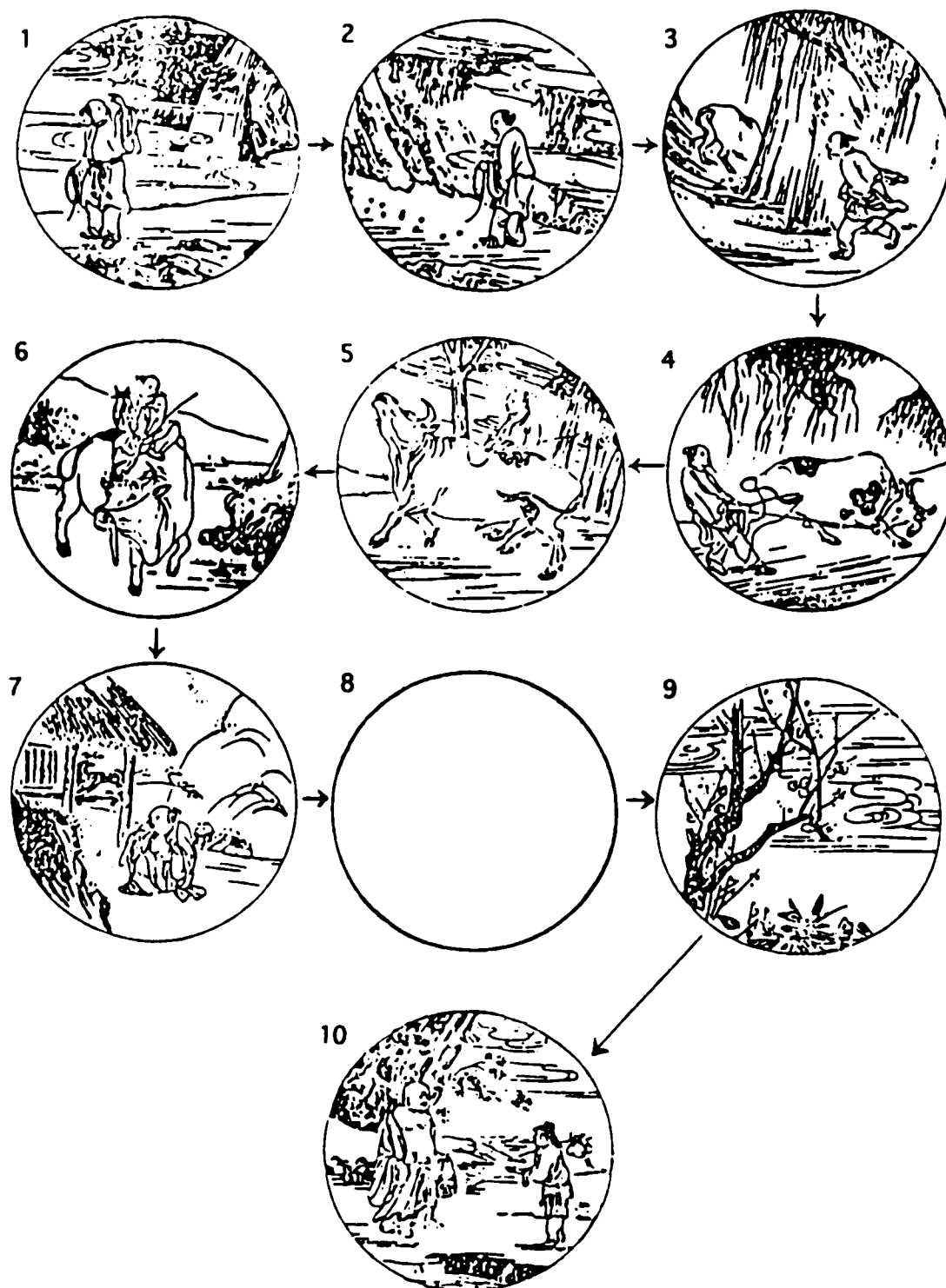


Fig. 40 Demonstration of Ten Steps of Sudden Enlightenment (Ten-Oxherding Pictures)

These ten steps, demonstrated in Fig.40, can be also summarized into six stages.

(1) The first two steps can be summarized as the first stage. In this stage, one even does not know where is the ox (mind). Thus, one has to firstly find where is the ox (mind).

(2) The third and fourth steps can be summarized as the second stage. In this stage, although the ox has been found, it is very hard to deal with.

(3) The third stage is summarized from the fifth and sixth steps. In this stage, the ox begins to be tamed and can be herded. It means that the mind or consciousnesses have begun to be decontaminated and converted back to the 7th and 8th consciousnesses.

(4) The fourth stage is equivalent to the seventh step, where the ox (the false mind or six consciousnesses) has been forgotten (converted back to the 7th and 8th consciousnesses), but the concept of the physical body still exists.

(5) The fifth stage is equivalent to the eighth step, where both the physical body and the ox have all been forgotten. It also means that both the false-mind and the matter have been forgotten, and indicates that one has enlightened.

(6) The sixth stage can be summarized from the steps of the ninth and tenth. This stage means that, after enlightenment, one acts and expresses whole naturally; and that one's false mind or consciousnesses have been completely converted back to the type of the pure- / true-mind. Thus, the true mind can be no longer contaminated from the environment and one can return to the human society to save people.

5.3 The Theory of Three Barriers (hierarchies) of Sudden Enlightenment

When Shakyamuni applied the approach of sudden enlightenment by “mind to mind” to transmit Tao (pure-mind / absolute truth) to the first patriarch, Mahakasyapa, there was no steps and no hierarchies for enlightenment. Therefore, this approach principally is applied to the person who possesses the highest wisdom-root. However, according to the Buddhist point of view, the wisdom-root of sentient-beings on this world is in regression.

Since the first patriarch, Mahakasyapa, in India descended to the first patriarch, Bodhidharma, in China, the wisdom-root of people had already regressed in some extent. Therefore, Bodhidharma’s Zen approach had to by the aid of some oral and written language (the *Lankavatara Sutra*). After the sixth patriarch, Hui-Nen (638-713) or the Tang Dynasty (the 7th-10th century), people’s wisdom-root became more and more decreased, thus his followers developed several different sects or subschools and established different approaches, as mentioned above, to teach different people with different wisdom-root.

Among these subschools, the most well-known one is the Linchi (Rinzai) school / Zen. When this school descended to Sung Dynasty (the 10th-13th century), a special approach was further established in this school. It is called Ch’en-Ch’an (i.e. a questioning approach of Zen) by using a Hua-Tou (a special question). On this basis of ten steps (Fig. 40), the three-barriers theory was also developed.

The theory of three-barriers means that in the process of enlightenment to attain Buddha there exist three hierarchies or thresholds. There are many different names of three barriers, but they are generally called the primary or patriarch barrier, the secondary or double barrier, and the final or prison barrier. There were several origins of this theory, but the major one was originated from the experience of Chingyuan, one of the five direct successors of Hui-Nen. During the beginning of Ch’ing Dynasty (the 17th century), this theory was integrated with the theory of Wei-Consciousness (Nan, 1986, pp.80-81; 1987, pp.61-80), shown in Fig.41.

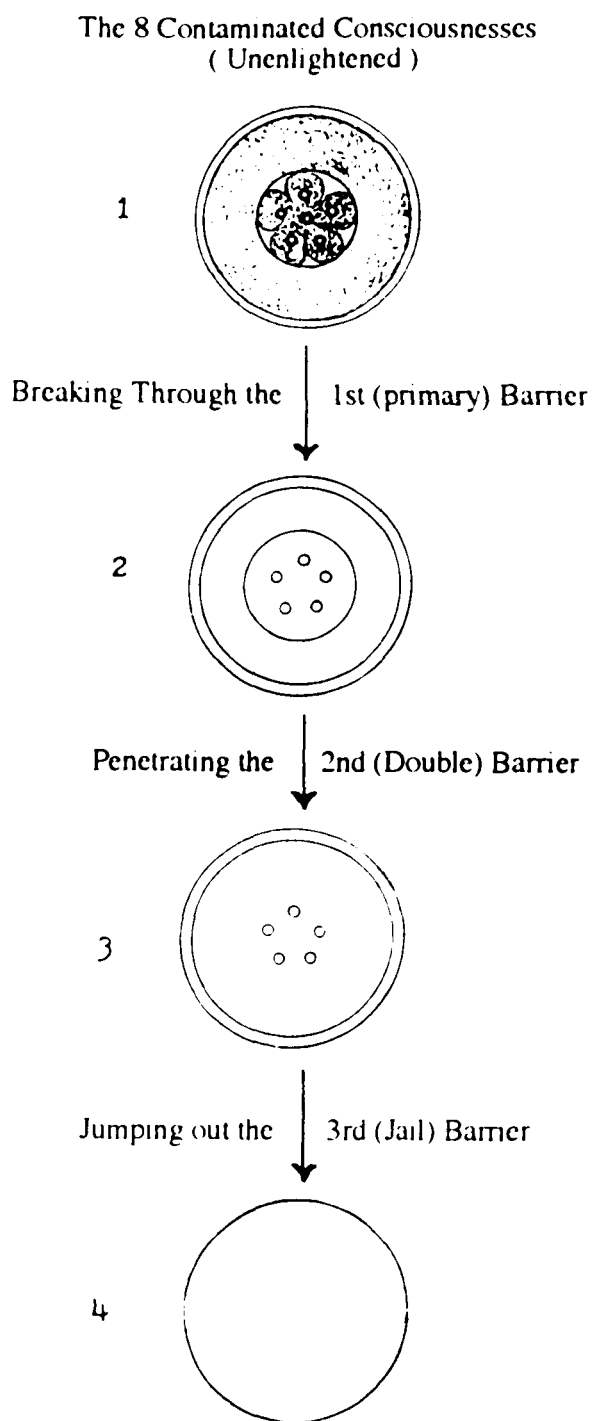


Fig. 41 Three Barriers in the Ordinary Process of Sudden Enlightenment

Chingyuen said (Chang, 1988, pp.173-178):

Before thirty years while I did not practice Ch'an, I saw a mountain that was a mountain and saw water that was water. Later, I learned from enlightened masters and practiced Ch'an, then I obtained an entrance to Buddhahood. At that time, I saw a mountain that seemed not a mountain and saw water that seemed not water. Now, I have attained a resting place, while I see a mountain that is still a mountain and see water that is still water.

Audience, whether are these three periods of time same or not ? If someone can answer this question, he are promised to see me.

It is thought that: (1) the first period of time is unenlightened yet, (2) the second period of time has enlightened but only breaks through the primary / patriarch barrier, and (3) the third period of time may be including the attainment of both the secondary / double barrier and the final / prison barrier (because of having obtained the resting place that means Buddhahood).

When the theory of three barriers or hierarchies / thresholds integrates with the theory of wei-consciousness (cf. Chapter 3), it is relatively easy to understand. Fig. 41 is a diagrammatical illustration of this integration (followed Hui-Quang, 1985, pp. 43-50, with some changes). It shows that: (1) the eight consciousnesses are all contaminated in a delusive situation; (2) the 6th consciousness has been transformed into the perfect-observing wisdom (the first five consciousnesses must be transformed together with the 8th consciousness), indicating that the primary barrier has been broken through; (3) the 7th consciousness has been transformed into the universal-equality wisdom, indicating the secondary barrier has been broken through; and (4) the 8th consciousness has been transformed into the great-round-mirror / perfect wisdom and the first five consciousnesses have also finally transformed into perfect-accomplishing wisdom, indicating that the final / last prison barrier has been "jumping out" and the Buddhahood or complete enlightenment has been finally attained.

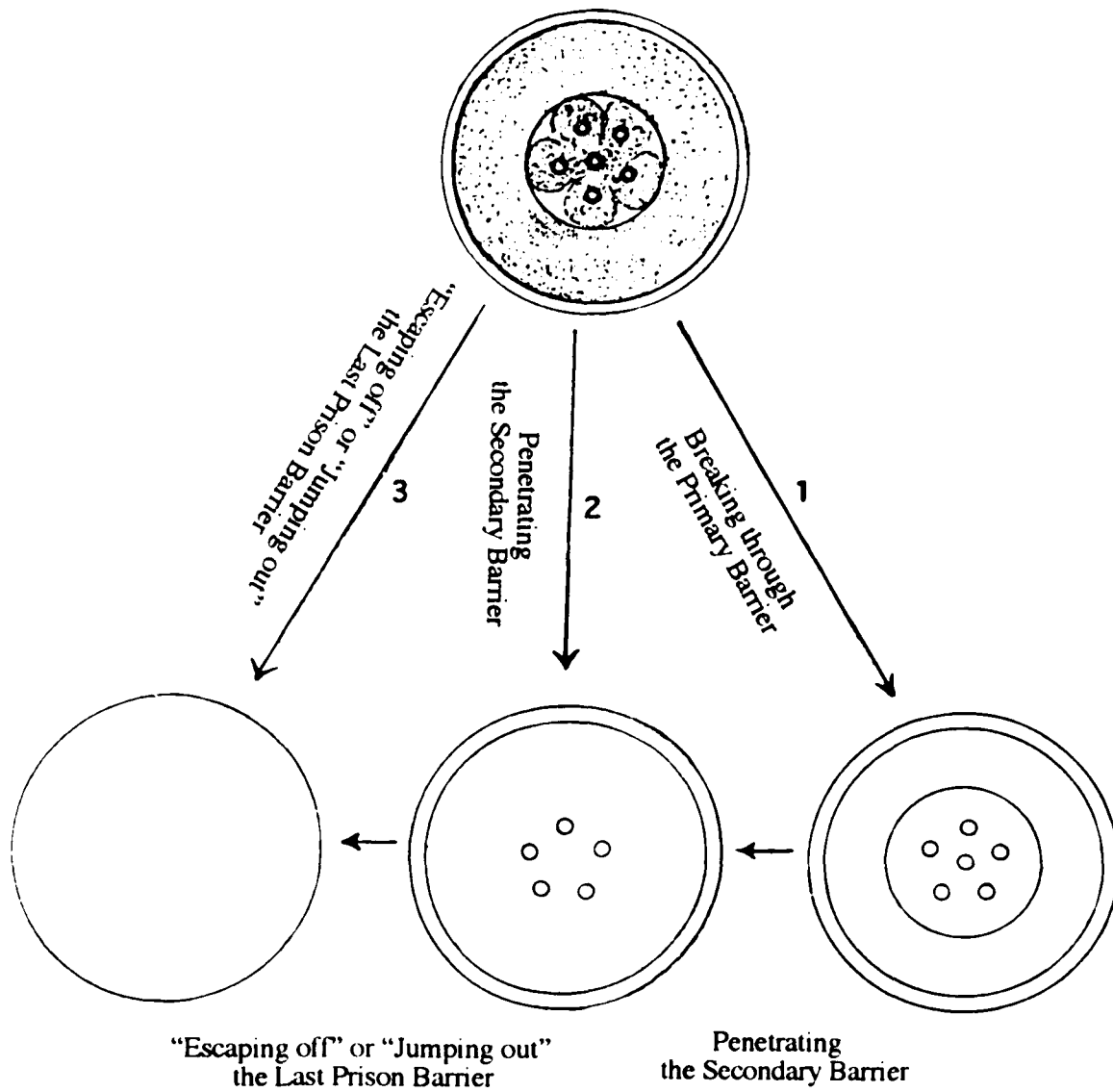


Fig. 42 Different Ways of Different Levels of Wisdom-Root Approach to Enlightenment

Fig. 41 shows the ordinary process through three barriers approach to complete enlightenment. In this process, the breaking through each of three barriers is a key sudden-enlightenment. During the process to attain a complete enlightenment, there are actually not only three times of enlightenment but many either bigger / deeper or smaller / shoaler ones. It is also the fact that different practitioners are different because they possess different wisdom-root.

Fig. 42 indicates that according to one's different wisdom-root, one can (1) either go through all three barriers to attain the final complete enlightenment, or (2) through two of them, or (3) only through one of them. The third situation is called "one enlightenment transcending all three barriers and directly attaining the Buddhahood" (this only occurs to very few ones who possess the highest wisdom-root).

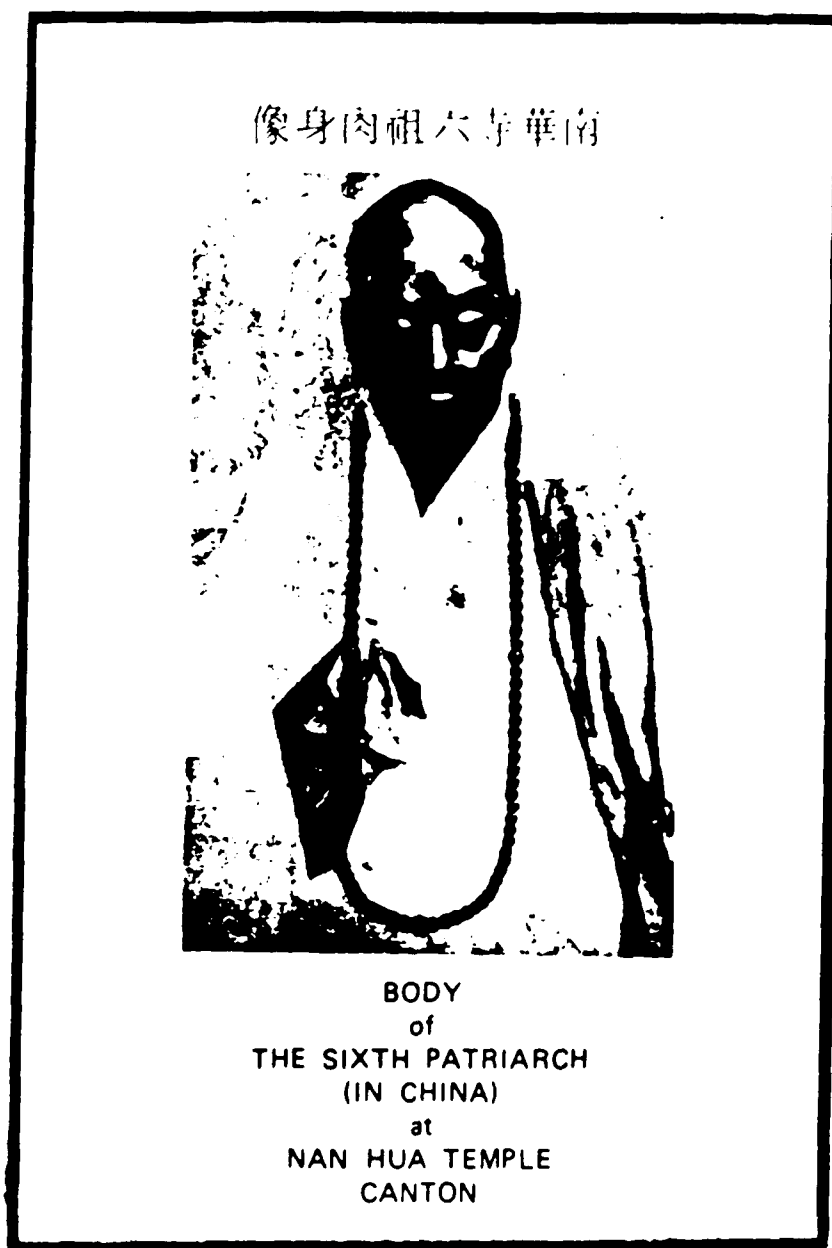


Plate 3 The Embalmed Body of the Chinese Sixth Patriarch Hui-Neng (638-713)
Preserved at Nan-Hua Temple today in Canton, China.



Plate 4 The Other Two Embalmed Bodies of Enlightened Chinese Zen Masters

Han-Shan (upper) and Dan-Tain (lower) are also preserved at Nan-Hua Temple today in Canton, China.



Plate 5 Two Modern Chinese Enlightened Zen Masters: Xu-Yun and Lai-Guo

Upper: Xu-Yun (1839-1959), long lived up to one hundred-twenty years old; and lower: Xu-Yun and Lai-Guo (left) met in Shanghai, China, 1953.

Part II Western Biophilosophical Theories

Introduction to Part II

Introductions and discussions of Eastern biophilosophical theories, mainly represented by Buddhist theories, have been made in Part I; and now in Part II, those of the West will be made. Then in Part III, comparisons and syntheses between them will be tried. However, in the process of the statement of those of the West, some comparisons with those of the East may be made immediately. Nevertheless, the major ones will not be made until Part III.

In the East, Buddhism is a very broad, complete and synthezied biophilosophical theory, in which includes many aspects of branches of subtheories and they are unified each other and concentrated in a central idea, an absolute noumenon, *bhutatahata*, or *nirvana*. This situation is somewhat different from that of the West, in which even the broadest theory of Aristotle's Vitalism is incomparable with Buddhism.

Because, in the West, there is without an absolute idea but only with an abstract one, this phenomenon may be a cause of the difference between the East and the West. Thus, there is without a basic unification among different biophilosophical theories, and then they have been in the situation of opposition and argument with each other since the time of Aristotle up to now. This phenomena may be a result, therefore, in this part, several opposite biophilosophical theories will be introduced. They are: *the theory of Vitalism* (old and new), *reductionism*, *Organicism*, and *hierarchy*.

In these Western biophilosophical theories, the last one is relatively independent. The other three are actually only two categories: the idealistic (the first one) and the mechanistic or materialistic (the second one). As to the third one, *Organicism*, because it is basically

composed of different lineages, which can be also divided into two categories: either inclining to the idealistic or to the mechanistic / materialistic, so it is actually not totally independent.

Furthermore, Vitalism, really, does not purely belong to Idealism, but rather than basically to dualism. It is because, in this theory, the soul, vital-force, or entelechy and the physical-body are primarily two independent categories of things. It seems that the former is like a tenant and the latter a house; and that this house is lent by the tenant but not built by himself. However, by whom this house is built and what is the origin of the soul, vital-force, or entelechy are all not clear. In addition, this kind of soul, vital-force, or entelechy are not like the pure-mind, true-life, *bhutatathata*, or even the 8th-consciousness of Buddhism, and the Chi of Taoism to be able to be experienced by ourselves.

Therefore, the concept of soul / vital-force is different from these Eastern concepts, in which both mind and material are included and the physical-body is created by themselves though the action of karma-forces / karma-seeds. The details will be compared and discussed in Part III.

This part is started from Aristotle's old Vitalism, followed by Driesch's neo-Vitalism and then Organicism. The fourth introduction is Reductionism, and the final is *the hierarchy theory* because of its development on the bases of the other four theories.

Chapter 10 Aristotle's Old Vitalistic Theory

I. Introduction

Concerning Western Biophilosophy, or the philosophy of life, Charles Singer (1950) mentioned: "The most fundamental division among biologists is between the schools known as the Vitalists and the Mechanists." (*A History of Biology*, p. 37). In other words, Western biophilosophy can be most fundamentally divided into two schools: Vitalism and Mechanism.

However, according to James Van der Veldt (1943), it can be divided differently into the school of Merism and Holism. Each of these can be further divided into the Vitalistic and the Anti-Vitalistic, respectively; and the Vitalistic-Merism can be again divided into Old-Vitalism and Neo-Vitalism. This type of classification can be summarized in Fig. 43.

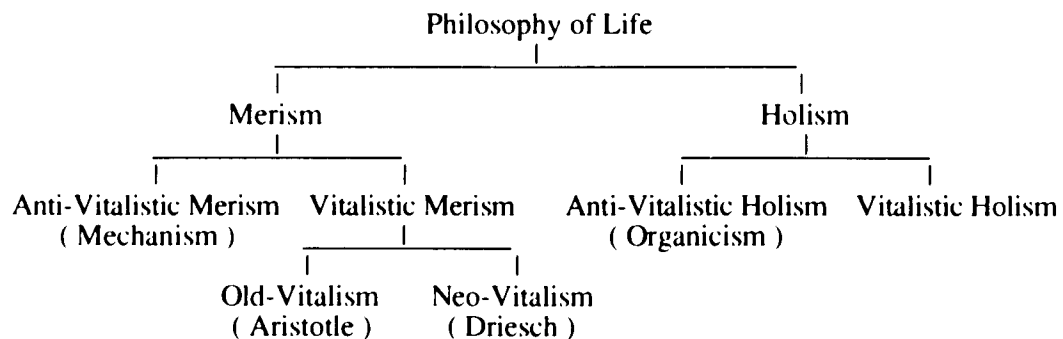


Fig. 43 Van der Veldt's Classification of Biophilosophical Theories

It is here according to Driesch's suggestion that call all Vitalisms before him, "old or traditional Vitalisms", and call his theory, "neo-Vitalism" (Driesch, 1914, pp.11-125).

II. Aristotle's Old Vitalism

I. Definition

Singer (1950) described Vitalism as follows:

The answer, so far as it can be given at this stage, is that living things contain some principle of a quite peculiar nature and quite different from anything that is found in matter that is not living. A vitalist must further believe that this principle not only exists but has some manner in which it shows itself to us (op. cit. p. 37).

It may be more generally said: Vitalism is a doctrine that the functions of a living organism are due to a vital principle, such as soul or psyche, vital-force or entelechy, and that the processes of life are not explicable by the laws of physics and chemistry alone and are mainly self-determined instead of mechanistically determined.

It is well known that Aristotle was a great ancient Greek biophilosopher, with an encyclopaedic erudition and a supreme power of original thought. He is one of the most universally appreciated investigators of living nature. Not only was he the founder of Western biophilosophy, he also contributed to logic, psychology, physiology, embryology, zoology, and botany.

Aristotle was a student of Plato, whose biology was broad in its concerns and compact in its presentation. Aristotle's bio-theoretical system is based upon that of Plato, however, by contrast, the biology of Aristotle was of oceanic proportions. According to Driesch:

He rejected his influence in respect of natural science in its narrower sense, owing to his greater logical precision: in his conception of 'Entelechy' he created the link between ideas and reality which is lacking in Plato; and this creation was just what the theoretical investigation of nature required (op.cit., p. 21).

According to Aristotle, the idea of Democritus's Atomism represented the idea of ancient Greek's Mechanism. Thus, Aristotle's own idea represented the ancient Greek's Vitalism. Aristotle emphasized:

This is what led Democritus to say that soul is a sort of fire or hot substance; his "forms" or atoms are indefinite in number; those which are spherical he calls fire and soul, and compares them to the motes in the air which we see in shafts of light coming through windows; the mixture of seeds of all sorts he calls the elements of the whole of nature (Leucippus gives a similar account); the spherical atoms are identified with soul because atoms of that shape are most adapted to permeate everywhere, and to set all the others moving by being themselves in movement (*On the Soul*, 1. 2, 403b31-404a7, Smith, tr., In: Barnes, 1984, *The Complete Works of Aristotle*, p.644).

Singer (1979) believed that " Aristotle is, in the fullest sense a 'vitalist'. He believes that the presence of a certain peculiar principle of a non-material character is essential for the exhibition of any of the phenomena of life." (p. 27).

According to Driesch (1914), " Aristotle's theory of life is pure Vitalism, and I may call it primitive or naive Vitalism." (op. cit., p. 19). Driesch also termed Aristotle's Vitalism " Old Vitalism." (op. cit., p.123). He further mentioned: " Aristotle is the authority till right into the middle of the eighteenth century, and for many right on into the middle of the nineteenth century." (op. cit., p. 21).

Therefore, Aristotle was a major proponent of Vitalism, or according to Driesch, the old Vitalism. This is principally due to his *Theory of Soul*, *Theory of Pneuma*, and *Theory of Development* . Aristotle's Vitalism may be said to comprise these theories.

2. The Theory of Soul

What is the *theory of soul* ? What in fact is the soul or *psyche* ? According to Aristotle:

Hence the soul (*psyche*) must be a substance in the sense of the form of a natural body having life potentially within it. But substance is actuality, and thus soul is the actuality of a body as above characterized..... If, then, we have to give a general formula applicable to all kinds of soul, we must describe it as the first kind of actuality of a natural organized body (Aristotle: *On The Soul*, II. 1, 412a 20-23, 412b 3-5, tr. Smith, In: Barnes, 1984, pp.656-7).

The soul is the first *entelecheia* (entelechy, actuality) of a natural body having the power of life; such will be whatever is organic (op. cit., II. 1, 412a 27, according to Preus, 1975, p.7).

According to Aristotle's descriptions concerning the meaning of the "soul" or "psyche", they may be analytically summarized and simplified into two aspects. The 1st is relatively less actualized and narrow, "a general formula applicable to all kinds of soul," which means "the first kind of actuality of a natural organized body." The 2nd is relatively more actualized and broader, which means "a substance in the sense of the form of a natural body having life potentially within it." In other words, the 1st aspect is narrow in sense that it means only the "soul," but does not include the "natural organized body." The 2nd aspect is broader in sense that it means:

soul = substance + life

Therefore, Aristotle's soul here is defined in a dualistic way. The meaning of life pertains to the narrow perspective on the soul. As to, what are substance, matter, form, potentiality and actuality ? Aristotle described:

We say that substance is one kind of what is, and that in several senses: in the sense of matter or that which in itself is not a this, and in the sense of form or essence, which is that precisely in virtue of which a thing is called a this, and thirdly in the sense of that which is compounded of both. Now matter is potentiality, form actuality; and actuality is of two kinds, one as e.g. knowledge, the other as e.g. reflecting (op. cit., II. 1, 412a 6-11, Barnes, 1984, p. 656).

What Aristotle was saying is that there are three meanings of "substance." Firstly, it means "matter" which is in "potentiality;" secondly it means "form" which is in "actuality;" and thirdly it means the combination of both "matter" and "form" or "potentiality" and "actuality." These can be shown as follows:

Matter (potentiality)

Substance means: Form (actuality)

Form + Matter (potentiality + actuality)

Thus, according to Aristotle's explanation," the meaning of the "substance" in explaining the "soul" belongs to the second meaning, "actuality." Both potentiality and actuality are possessing of a kind of power which will be explained below.

Therefore, the meaning of "soul" can be simply said "the first actuality." However, one needs to know: from what kind of thing is the soul firstly actualized ? To answer this question, one needs to ask a prior question: what are the meaning of and the differences among *entelecheia*, *energeia* and *dynamis* ? According to Preus (1975):

In the *de Anima* (*On the Soul*) passage, the *entelecheia* is the presence of a power which is present by virtue of the presence of an organ. In the *GA* (*Generation of Animals*) passage, the *energeia* is the activity of an organ. ... The distinction between *dynamis* and *energeia* drawn here may then be the distinction between having (but not exercising) and exercising a power (op. cit., pp. 80-81).

matter or substance attains to this kind of form, viz., there is life or soul or vital principle in it, it is actualized in the first sense. However, it is not completely actualized unless the organism is exercising its vital faculties.

Now, one may further ask: what are the vital faculties, functions, or powers of soul ?

Aristotle mentioned many different kinds of vital faculties, but they can be basically divided into four: first, the nutritive (shared by every living thing including plant); second, a set of sensitive faculties (limited to animals including man); third, the locomotive faculties (limited to animals, including man, that can move around); and fourth, the rational faculty (limited to human beings). They can be summarized in table 1 (improved from Hall, 1969, 1975).

Table 23 Distribution of the Vital Faculties of Aristotelian Soul

Faculties	Plants	Animals		Man
		Non-motive	Motive	
Nutritive	+	+	+	+
Sensitive				
Immediate (touch, taste)	—	+	+	+
Mediate (smell, hearing, sight)	—	—	+	+
Locomotive	—	—	+	+
Rational	—	—	—	+

Aristotle discussed the sensitive faculty or sensation in depth. The sensitive vital faculty is related to senses, which are in themselves only potentialities. To be actualized, they have to be acted upon by external sensible objects. During this process of actualization, the subject's sensibility and the object's sensitivity become identified. These actualized senses are

sensations. There are five senses and corresponding sensations: namely, sight, hearing, smell, taste, and touch. Aristotle dealt with sensation as a first important characteristic for animals.

This is the origination power the possession of which leads us to speak of things as living at all, but it is the possession of sensation that leads us first time to speak of living things as animals; for even those beings which possess no power of local movement but do possess the power of sensation we call animals and not merely living things (op.cit., II. 2, 413b 1-5, p. 658).

Aristotle also thought: " The primary form of sense is touch, which belongs to all animals " (op.cit., II. 2, 413b 6, p. 658). Now, one may ask: what is it which unifies or distinguishes the data from different senses ? Is there any common sense-faculty to do this, and where is the reaction center of sensations ? Aristotle considered these problems and gave his answer:

Certainly, however, all sanguineous animals have the supreme organ of the sense-faculties in the heart, for it is here that we must look for the common sensorium belonging to all the sense-organs. These in two cases, taste and touch, can be clearly seen to extend to the heart, and hence the others also must lead to it, ... if the life is always located in this part, evidently the principle of sensation must be situated there too, for it is *qua* animal that a body is said to be a living thing, and it is called animal because endowed with sensation. Elsewhere in other works we have stated the reasons why some of the sense-organs are, as is evident, connected with the heart, while others are situated in the head. It is this fact that causes some people to think that it is in virtue of the brain that the function of perception belongs to animals (*On Youth, Old Age, Life and Death, and Respiration*, 3, 469a 10-23, tr., Ross; In: Barnes, 1984, p. 747).

Aristotle raised an interesting point. As will be discussed later, his idea is somewhat related to Eastern ones, especially to Buddhism, concerning the root of five sensations.

3. The Theory of Development

In these theories, Aristotle tried to use his ideas of *entelecheia*, *energeia*, *dynamis* and *pneuma* to describe: how an organism reproduces, how the soul transfers from parent to offspring, how the resemblance and lack of resemblance between parent and offspring is explained, how new life begins, and how the embryo of next generation develops.

The phenomenal world (pheno-world) is in permanent change. Is change imaginable ? Can a changing world be understood ? Can non-being change to being ?

Philosophers before Plato tried to find a way to deny changes involving non-being. Plato tried to deal with this problem in his later dialogue in the *Timaeus*. He resolved the problem of change by making it connected with the absolute *eidos*. According to Plato, there exist two worlds: the noumenal or absolute and the phenomenal or relative. They are different but also are integrated with each other. From the viewpoint of the noumenal world (noumeno-world), there is no substantial actual change, for the form, or *eidos*, is a truly existing thing. Form or *eidos* is changeless, constant and eternal.

From the viewpoint of the phenomenal world (pheno-world), in contrast, change is expressed in individual attributes, fleetingly conglomerated together. The phenomenal attributes possess a kind of dependent being in relation to the eternal form or *eidos*. The *eidos* alone is called an *ousia* (i.e. an entity or a real being). Plato's ideas are also somewhat similar to the Eastern ideas, those of Taoism, Buddhism and neo-Confucianism. However, there are also some essential differences between them, which will be discussed in the Part Three.

Aristotle was not satisfied with Plato's solution (*Generation and Corruption*, II.1, 329a10-15, tr. Joachim; In: Barnes, 1984, p.538). It seemed to Aristotle no solution at all, and he objected to it. He considered that the most obvious truth is the pheno-world, which is composed of things, of human beings and animals, and other individual non-beings. Aristotle's objection to Plato's metaphysical analysis is that it makes the ordinary entities of the world

disappear by turning them into a conglomeration of predicates, and gives the predicates or attributes an existence which they cannot support by turning them into eternal entities (*Metaphysics* Zeta, 13-14; Preus, 1975, p.49). However, according to Preus (1975):

Aristotle's solution to the problem of existential change is, none the less, based upon much of the Platonic analysis. For Plato, phenomenal attributes have their reality in relation to the *eidos*; for Aristotle, phenomenal entities have their reality as examples of the *eidos*, which he understands as an everlasting object existing in and through the individuals. Although for Plato the *eidos* alone is an *ousia*, for Aristotle both the individual and the species (*eidos*) may be called *ousia*. For both philosophers, everything which is not an *ousia* has its being in and through some relationship to an *ousia* (op. cit. pp. 49-50).

Aristotle applied the distinction between potentiality (*dynamis*) and actuality (*entelecheia*) to each kind of change, which he made a general definition as the actualization of potentiality (*Physics* III. 1; also see Preus, 1975, p.49). His theoretical solution of this problem can be also found in this book (op. cit., V-VIII, Barnes, pp.378-446).

Aristotle tried to use his theoretical solution of this problem in *Physics* and *Metaphysics* to the actual phenomena of generation in *Generation of Animals*. He applied his concepts of matter and form to provide a starting point for the explanation of generation. He believed that the male provides the moving cause of generation, and that by semen transfers the form (*eidos*) and soul (*psyche*) to offspring (*Generation of Animals*, II.1-3, tr.Platt; In: Barnes, 1984, pp.1135-1144). In the process of actualization of potentiality (*dynamis*) to actuality (*entelecheia*), or transferring the *eidos* and soul to offspring, Aristotle also often utilized several other ramifications of the concepts, such as *dynamis* (potentiality), *energeia* (activity, actuality) and *pneuma* (breath, hot air). They will be mentioned below, respectively.

Aristotle's *Theory of Development* is contrary to the *Theory of Pangenesis* and the *Theory of Preformation* (Preformationism), which were held by Empedocles (495-435 B.C.)

and Hippocrates (c.460 - c.370 B.C), et al. The *Theory of Pangenesis* holds that the generative material is drawn from the all parts of parental bodies. Preformationism supposes that certain individual parts or even " a small animal " have already pre-existed in the generative material. " In contrast to all these theories, Aristotle argues that one ought to look for some *one* material which can carry the active principle for making all the others; one should look for a spermatic material which is not *from* all the parts of the body, but *for* the whole body." (op.cit., p.54).

Aristotle's general name for semen and menstrual fluid or menses is *sperma*, which acts like "seed" and is the residue of blood. Therefore, there are two different kinds of *sperma* : the male (semen) and the female (menses). According to Aristotle's assumption, the male provides the form and soul, the active or moving or dynamic structure; and the female provides the matter, the passive structure (op.cit., I. 20, 729a 9-14, p.1132). In other words, it seems that " the male does not contribute anything to the quantity but only to the quality of the embryo " (op.cit., 730a 20-21, p.1133).

It is very interesting to mention here that Aristotle and Shakyamuni all raise the ideas of "seed". However, their meaning and location are different. This problem will be also further discussed in Part III.

Aristotle used his famous carpenter analogy to account for the functions of semen. In the case of carpenter, the form is present in his soul.

It is his hands that move his tools, his tools that move the material; it is his knowledge of his art, and his soul, in which is the form, that move his hands or any other part of him with a motion of some definite kind, a motion varying with the varying nature of the object made. In like manner, in the male of these animals which emit semen, nature uses the semen as a tool and as processing motion in actuality, just as tool are used in the products of any art, for in them lies in a certain sense the motion of the art. Such, then, is the way in which these males contribute to generation (op.cit., 730 b 15-24, p.1134).

According to the view of Buddhism, Aristotle's ideas are incorrect. The soul or form

or the seeds in the 8th consciousness exist naturally and is not carried only by male or even both male and female generative cells, which are only conditions for the rebirth (not actually birth but only transformation and transmigration).

Potentiality (*dynamis*) is in relation to the *ousia*. There are two different statuses of both *dynamis* and *energeia*: the passive and the active (Preus, 1975, pp. 50 & 52). In terms of passive and active statuses, thus, the relationships among *dynamis*, *ousia*, *entelecheia*, and *energeia* can be shown in Fig. 45.

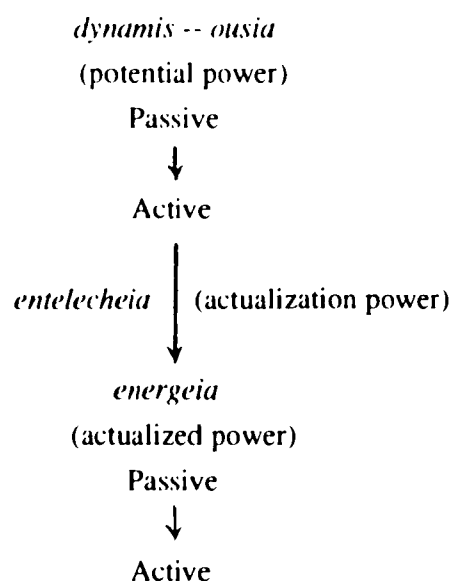


Fig. 45 Relationships among *Dynamis*, *Ousia*, *Entelecheia*, and *Energeia* in terms of Active and Passive Statuses.

Matter and form are also of passive and active statuses. Furthermore, matter and moving are strictly separated to female and male, respectively. Aristotle's these ideas are somewhat related to the *Yin-Yang* (negative-positive) concept of *I-Ching* (the *Book of Changes*). How can the passive change to the active? Aristotle did not mention very clearly.

Aristotle pointed out that if an agent is to be a source of movement, it must have an active power from *dynamis* or potentiality to initiate a series of movement or change. The matter for initiating a change may have only the appropriate passive power. But anything to be served as an intermediary between agent and matter must have both active and passive powers. Such an intermediary is known as a "moved mover". Semen is looked upon as such a "moved mover".

Aristotle further mentioned: " Whatever is generated naturally or artificially is generated by something which is ' in activity ' (*energeia*) from something which is such ' potentially ' (*dynamis*). Semen is such, and has such a movement and principle, that when the movement stops each of the parts is generated and is ensouled " (op. cit, 734b 21-25; Preus, 1975, p.71). In general, movement in the semen is described as an *energeia* rather than as an *entelecheia*.

" Has the semen soul, or not ? " Aristotle asked, "...no soul will exist in anything except of which it is soul; it is plain therefore that semen both has soul, and is soul, potentially" (op. cit., 735a 5-9; Barnes, 1984, p.1140-1141). The potential presence of powers is all packed in the word *dynamis*.

Aristotle seems to suppose that the soul is a power, or a closely interrelated group of powers. The male parent imparts movements and vital heat to the semen, and the semen in turn imparts the movement and heat to the menses of the female parent. Therefore, it seems that semen transfers the powers to menses by preserving the form of the movements (Preus, 1975, pp. 74-75).

Aristotle also pointed out that semen does not have the activity of the sensitive soul; thus, it is not an animal. But it does have the generative faculty of soul, its activity is for generation. It generates offspring, possessing the same soul faculties and powers as its parent.

4. The Theory of *Pneuma*

On the basis of the *Theory of Soul*, Aristotle raised another theory, the *Theory of Pneuma* as the special physical basis of the soul. What does *pneuma* mean ?

There was no special connotation of the word "*pneuma*" in Greece during the Aristotle's day other than the word "breath" in English. Therefore, Aristotle said: "*Pneuma* is 'hot air'." (op.cit., 736a1; Barnes, 1984, p.1142). He also said: "Semen, then, is composed of breath (*pneuma*) and water, and the former is hot air; hence semen is liquid in its nature because it is made of water." (op. cit., II.2, 736a1-2, p.1142). Aristotle further said (op. cit., 736b 29-737a 1, p.1143):

Now it is true that the faculty of all kinds of soul seems to have a connexion with a matter different from and more divine than so-called elements; but as one soul differs from another in honour and dishonour, so differs also the nature of the corresponding matter. All have in their semen that which causes it to be productive; I mean what is called vital heat (*pneuma*). This is not fire nor any such force, but it is the breath included in the semen and the foam-like, and the natural principle in the breath, being analogous to the element of the stars (*aither*)

Preus interpreted the meaning of Aristotle's *pneuma* and made it relative comprehensible. Preus (1975) explained:

The 'powers' associated with air are heat and fluidity. We suppose that *pneuma* is superheated air, and that the added heat is the vital heat, or body heat, at first of the father Not only the *pneuma* in the blood but also the breath can be called superheated air; exhaled breath has a higher temperature than the surrounding atmosphere, and the added heat is in fact 'vital' heat " (op. cit., p.116).

There are actually two senses of the word "*pneuma*": the breath or hot air and vital heat or vital spirit. Therefore, Aristotle's *pneuma* can be defined as breath or hot air and vital heat

or vital spirit. It can be also as a terrestrial analogue of *aither*, a special kind of heavenly matter which is not discussed here.

Although Aristotle did not find *pneuma* in any location, he believed that it exists in semen and in developing organisms. It is everywhere in the organism, but is indistinguishable from the body of an organism. Even if *pneuma* could be, in some way, distinguished from the other elements of the body, it could not be distinguished from different parts of the male or of the female, which also contributes some *pneuma* to the embryo. All of the *pneuma*, both from semen and from menses, come together. It is only with its nature, called symphyton.

Thus, Aristotle used the idea of *pneuma* as a physical basis to interpret how the soul is transferred from parents to offspring, mainly through the male (semen) and also somewhat through the female (menses).

Aristotle also explained his *pneuma* as a power for initiation of fertilization and fetation, and for processing of the development and differentiation of an embryo. He said: "The portion of the soul-principle which is enclosed or separated off in the *pneuma* makes and puts movement into the fetation." (op. cit., III.11, 762b 16-18; Preus, 1975, p.88). It seems that the generation of an embryo needs at least three factors: the soul with *pneuma* from the male as form; the character of *pneuma* as power; and the material from the female to be organized. Thus, Aristotle's *pneuma* is somewhat like a modern biological term "organizer" of Spemann (1924 & 1938) and Bertalanffy (1933).

With the aid of *pneuma*, Aristotle also interpreted the beating of heart (*Respiration*, 20, 479b 27-480a 16; Hett, 1964, tr., pp.476-479, with some changes; Preus, 1975, p.116):

The characteristic beating of the heart ... is like boiling; for boiling occurs when fluid is pneumatized by heat. ... In the heart pulsation occurs due to the expansion by heat of the liquid food-product which continually enters it ... there is a continuous influx of this fluid, of which the blood is constituted ... Pulsation is the pneumatization of the heated fluid.

5. The Root of Sensations: the Heart or the Brain

According to Aristotle, during the animal embryonic development of organs, the heart or its analogue is generated first. He mentioned:

So also in the embryo all the parts exist potentially in a way, but the first principle is furthest on the road to realization. Therefore, the heart is first differentiated in actuality (op. cit., II.4, 740a 2-5; Barnes, 1984, p.1148).

The movement is a change of quality (such as softness, hardness, color, and the other differences of the homogeneous parts); thus they become in actuality what they previously were in potentiality. And what comes into being first is the first principle; this is the heart in the sanguinea and its analogue ... (op. cit., II.5, 741b 12-16, pp. 1150-1151).

Why must the heart differentiate first ? Aristotle explained:

This is clear not only to the senses (for it is so) but also on theoretical grounds. For whenever the young animal has been separated from both parents it must be able to manage itself, like a son who has set up house away from his father (op. cit., II.4, 740a 5-7, p.1148).

Or, it is just because the heart is the " first principle". Peck further explained that " the heart must be formed first, *because it is the seat of the symphyton pneuma* " (op. cit., Preus, 1975, p.114). It is very interesting that this notion is also related to Buddhist idea, which claimed the heart being the central seat of the 8th consciousness; although these ideas are not exactly equivalent.

From the beginning, the heart has to have proper *energeia*. This *energeia* is an active *dynamis*, so-called *kinesis*. It is the nature of the father or the semen, and the nature of the heart or the offspring. This nature, as an activity, continues from parent to offspring. In

the embryonic development, it is actually nothing other than the soul. Every part of the body has to be presence of the soul (op.cit., II.5, 741a 8-10, p.1150). According to Aristotle, the heart is the "ruling" part that must have the activity of all soul.

The generative function is most obviously in operation at every stage. After the emergence of the heart, the sense organs also gradually emerge. It is believed that the sensitive faculty develops out of the generative faculty. However, the development of the generative faculty requires the activation of the male or semen (op. cit., II.3, 736a 24 ff, p.1142).

As mentioned above, Aristotle supposed that the root of the sensation is located in the heart rather than in the brain. Then, we must inquire as to the function of the brain. Aristotle replied:

Because the source of sensations is in the heart, therefore this is the part first formed in the whole animal, and because of the heat of this organ the cold forms the brain, where the blood-vessels terminate above, corresponding to the heat of the heart. Hence the parts about the head begin to form next in order after the heart, and surpass the other parts in size, for the brain is from the first large and fluid (op.cit., II.6, 743b 25-32, p.1154).

Thus, according to Aristotle, the function of the brain is to cool the heat of the blood. Consequently, it may function to preserve the proportion of heat in the body of an animal. Peck (1963) further suggested:

Everything needs a counterbalance, so that it may achieve moderation and the mean; for it is the mean, and not either of the extremes apart, which has the entity and the *logos*. For this reason nature has contrived the brain to counterbalance the region of the heart and the heat of it.

It is interesting to point out that Peck's idea is somewhat similar to the Eastern Meanism of either Buddhism or Taoism and Confucianism. However, according to Buddhism, the function of the brain is not only for the cooling of the heat of the heart, but also mainly as a root

for the six sense-organs, one more than the Aristotle's five sense-organs. The sixth is a consciousness organ. So, the function of the brain differs from the heart, which is the central seat of the eighth consciousness. This is a big difference between Aristotle's Vitalism and Buddhism, concerning the sensation system.

In contrast to Aristotle, Plato in his *Timaeus* (44d,69e, & 90a) considered the brain as the seat of reasoning, while the followers of Hippocrates thought of the brain as the seat of sensation. But Plato also argued that many of the functions of the soul are located in the heart, and some of them are even in the stomach (op. cit., Preus, 1975, p.125). Thus, Plato was inclined the view of three centers of the soul. It is also very interesting to mention that Plato's three-center idea is somewhat similar to the three-center concept of Chi in Taoism (Shen, 1991).

In general, according to Aristotle, there are several points showing the heart as the seat of the soul. Firstly, due to the location of the typical part of the body, the heart seems more satisfying as the physical center; the brain is at an extremity. Secondly, the beating of the heart serves as a pump, which must indicate something important and may associate with the functions of the movement of the body; but the brain does not act in such a way. Finally, the heart appears first in embryonic development, which seems showing more basic functions; but the brain differentiates dramatically in a later sequence (op. cit., Preus, 1975, p.125).

Plato made the brain as the seat of reasoning. However, Aristotle supposed that the active reasoning does not need a physical basis at all (op.cit., III.4-6; Barnes, 1984, pp.682-685). Aristotle's view is somewhat similar to the Buddhist view of the Buddha nature or pure mind, which is transcendental beyond all of the physical roots of consciousnesses.

Modern Western biophilosophers, biologists, especially neurophysiologists are surprised that Aristotle considered the heart to be the center of perception and movement. Most, if not all of them, consider Aristotle's assertion to be unreasonable, and thus, unscientific. They believe that modern biophilosophy, biology, and neurophysiology have

advanced and progressed further than the notions of Aristotle. This is true.

However, many modern scientists principally evaluate the structure and function of material by using their six consciousnesses as well as some advanced and elaborated instruments. They believe the results of their scientific experiments singularly based on their beliefs that their consciousnesses and instruments are all correct. They are not in doubt about the reliability of their own consciousnesses and instruments, especially the former.

Most modern scientists do not believe that there is anything beyond the physical world and physical sciences. They do not ask if they can perceive things not by consciousnesses. They also do not have any methodology to go beyond five senses and the 6th consciousness and check their reliability. Some limitations and problems of modern sciences are thus produced. These will be further discussed in Part III.

Fortunately, in very recent years, there have been some modern physicists inquiring about transcendental science (Takashima, 1988; Mansfield, 1989, 1990). Hopefully, they will further go ahead more and more, and some modern biologists will also follow up immediately.

6. The Soul and Inheritance

Aristotle may have been the first to explain the origin of the differences of sex. He believed that the semen of the male, in contact with the menses of the female, always "tries" to make it into a male. However, it sometimes fails, due to the recalcitrance of the material. Then, an opposite sex (the female) results. The same general principle also applies to the degrees of lack of resemblance between offspring and parents. Sometimes, some offspring resemble their grandparents, or more remote ancestors. Some do not have the form of a man, but of a monster, which is a deviation of the scale of nature (op.cit., IV.3, 767a 36-767b 9; Barnes, 1984, p.1187).

According to the *logos* in women, movement or power constructs the menses. This *logos* depends not only on the immediate parent, but also on the ancestors, species, and genus. By making the distinction between *dynamis* (potentiality) and *energeia* (activity, actuality), Aristotle explained different sorts of deviation from the male parent. He proposed that any resemblance to the female parent or its ancestors is due to "departing from type and changing over" to the opposite. It is due to "relapsing" that offspring resemble ancestors rather than to immediate parents. Furthermore, Aristotle mentioned:

Some of the movements exist actually, others potentially; actually those of the father and the general type, as man and animal; potentially, those of the female and the remoter ancestors (op. cit., IV.3, 768a 12-15).

If one would like to make some connections between Aristotle's idea and Mendelian genetics, one would say that Aristotle's female characteristic is recessive and those of the male is dominant. However, these two are essentially different. Aristotle's was vitalistic, while the Mendel's was materialistic. But here, it may be considered that the Aristotle's idea is somewhat like the *Yin-Yang Theory* of *Taoism* and *Confucianism*.

7. Vitalism and Teleology

The third problem within Aristotle's theories is teleological. According to Aristotle, there exists a "special thing", the soul or form or *eidos / ousia* or *pneuma*, in a developing embryo, which comes from the male and "guides" the embryonic development. Therefore, this "special thing" reproduces itself for its own sake and continues itself through *spermata* to its

offspring, cyclically and perpetually.

From the starting point of the concocting of semen and menses, through the genesis and decay, and to the individual end of death, such ontogenetic process of development and its continuously cyclical perpetuity can be understood as the permanent existence and the preservation of the *eidos / ousia*. It may be said that the idea of species is the actuality of the *eidos / ousia*. Since there is the cyclic nature of the perpetuity of a species, the repetition of the process of species development can be understood as the evidence of purposiveness.

Therefore, Aristotle's teleological idea of development can be summarized as the actualization and preservation of the *eidos / ousia*, and his idea of the perpetuity of cyclicity / repetition.

III. Old Vitalism after Aristotle

From Aristotle's old Vitalism to Driesch's neo-Vitalism, there was a long period of time. Within this period of time, there were a number of different types of old Vitalism. Therefore, we divide this period of time into 3 stages: the first---from Theophrastus through Galen to pre-Harvey's Mid-Age; the second---from Harvey to Wolff; and the third---from Blumenbach to Liebig.

1. First Stage: from Theophrastus through Galen to pre-Harvey's Mid-Age

Aristotle was the greatest representative of the old Vitalism. After Aristotle, a botanist,

Theophrastus, succeeded him. With the death of Theophrastus about 287 B.C., the "biological science substantially disappears from the Greek world." (Singer, 1979, p.61).

Almost five centuries later, another great vitalistic biologist, Galen (131-201), appeared in the late Greek period. Although Galen was committed to vitalism, his ideas somewhat varied from those of Aristotle.

According to Galen, life basically depends on breathing, which means to take in of spirit (Latin: *anima*, Greek: *pneuma*) from the general "world-soul". After the world-soul comes into a living animal body, it is elaborated and endowed with three kinds of spirits which are essential for life and health. The *pneuma* originating in liver is called the *natural spirit*. This carries nutrition from intestine to body by veins. The *natural spirit* mingles with the *pneuma* from lungs to be elaborated into a higher form: the *vital spirit* which is distributed by ebb and flow within arteries. When the arterially conveyed *vital spirit* reaches brain, it undergoes a further elaboration, resulting in the formation of the *animal spirit*. This travels to all parts of the body along the supposedly hollow nerves. These spirits, like fluids, flow all over the body, so they are also called *vital fluids*. (Weeler, 1939, *Vitalism: Its History and Validity*, pp.10-13).

Galen, unlike Aristotle, who believed that the heart was the chief organ which provided the "innate" heat of the body, thought that the liver functioned in this way. Galen, also unlike Aristotle, who considered the heart as the root of sensitive soul, thought the brain as the root of the *animal spirit*, which corresponds to Aristotle's sensitive and rational souls. Galen's idea influenced later biologists, although his other two "spirits" were overthrown by Harvey's discovery of the double circulation of blood.

In the field of physiology, Galen's vitalistic influence was even bigger than that of Aristotle's until Harvey's time. However, it was unfortunate that Driesch did not mention Galen in his books (op.cit., above).

2. Second Stage: from Harvey to Wolff

William Harvey (English: 1578-1657) was well known for his discovery of the double circulation of blood. He was a great physiologist. Although Harvey's discovery overthrew Galen's concept of *vital fluids*, Harvey was also a great vitalist. He dealt with development epigenetically, not as mechanical laws but as a specific life power, an "opifex" or master builder, a "principium" or an internal principle / force. Harvey tried to go further than Aristotle did in explaining the action of the principle of a higher soul (op. cit., Wheeler, p.16).

Although Harvey was also a vitalist, his elaborate experimental method gave rise to a mechanistic influence. One might think that there was no need to suppose some kinds of special agents, such as soul, principle, *pneuma*, spirit, and opifex, to explained and realized the nature of life and life phenomena. It was significantly demonstrated that if one wants to reach some goals, one can only reach by certain appropriate experimental methods, but not something else.

Descartes (French: 1596-1650) was a great philosopher but a poor biologist. His ideas have a "yin-yang" (negative-positive) characteristic, in which one half is vitalistic and another half is mechanistic. He used "Harvey's teaching about blood circulation and Aristotle's ideas of innate heat in the heart and animal spirits, together with purely imaginary details of his own, for his own purpose, which is to show that the human body works as a machine to which a rational soul, comparable to that of Aristotle, is added. Descartes was a vitalist as regards Man but a mechanist regarding animals and, of course, plants." (op.cit.,Wheeler, p.19). However, Descartes, in contrast to Aristotle, located the soul in the pineal gland. Of his later influences, the mechanistic-half was greater than the vitalistic-half.

Van Helmont (Dutch: 1572-1644) was a physiological vitalist. He revived Aristotle's fundamental ideas of sensitive soul and immortal mind. Helmont believed that there are certain

"embodiments of energy" or psychic forces, and that through these forces a Supreme Being controls chemical changes and other vital events. He called these forces *archaei*. Among them, there is a chief *archaeus* and some minor *archaei*. In a state to be healthy, the chemical processes of the body are rightly governed by the *archaeus*, which fails during disease and is lost at death. Concerning the sensitive soul, like Descartes's rational soul, Helmont conceived of some subordinate *archaei* or vitalistic forces, called *blas*. *Blas* and *archaei* function respectively during various stages of sensation, digestion and assimilation.

George Ernest Stahl (German: 1660-1734), a court physician and a professor of medicine, was well known as the originator of the *phlogiston theory* in chemistry. He omitted all the minor vital forces, the *blas* and *archaei*, of Van Helmont. Stahl thought that the sensitive soul was the immortal spiritual part of man, which controlled all chemical and physiological changes in the living body. He also believed that these changes were essentially different from any corresponding reactions which could be obtained by experiments in the laboratory (Foster, 1924, *Lectures on the History of Physiology*, p.167).

However, there still remains an unsolved difficulty (op. cit., Wheeler, p.25):

Either the human mind or spirit is an epi-phenomenon, a sort of by-product of bodily phenomena, as Huxley suggested, thought is 'a secretion of the brain as bile is of the liver' (K.Vogt), or thought, mind, soul, are independent of each other. ... Descartes thought, God orders this psycho-physical parallelism. If not, there is a connection. Descartes tried to give a physical explanation, though he only centered the difficulty inside the pineal gland. Van Helmont interposed a hierarchy of *archaei*. Bergson and Eddington (*vide* III (b) 2, iii and iv) suggest that the connection occurs between the spirit and cerebral cortex.

Stahl supposed motion as the solution. By motion, the soul carries out all its doings and controls and modifies all the physical and chemical changes. He believed that the soul diffuses over the whole body (op. cit., Foster, pp.169, 171, 295). In contrast to Aristotle, Stahl explained the action of the soul deeply as originating at a chemical level. To him, "the

body was exactly the reverse of a machine." "It is usual to speak of Stahl as a Vitalist, even as the founder of the vitalistic school in physiology." (op.cit., Wheeler, p.26). According to Driesch, "Stahl gave us the first great scientific system of theoretical biology after Aristotle; ..." (op. cit., Driesch, 1914, p.36).

George Louis Leclerc Buffon was a forerunner of evolutionism before Charles Darwin. He raised the question of whether all future grains are contained in a present grain. His answer was negative. He established an evolutionistic theory of development, which "on the one hand makes him a Vitalist, and on the other bears a certain degree of resemblance to Darwin's famous theory of Pangenesis" (op. cit., Driesch, 1914, p.41).

According to Buffon, there is an "inner form", or a "*moule interne*". This "inner form" represents the whole organism as manifold, directs its development, and integrates order to the newly-set substance. The development is mere growth and enlargement; and the order arises "from the arrangement of all the parts of the inner form." The origin of this inner form is not from "some other pre-existing form". It originates from some "peculiar forces" of life itself.

It is very interesting to note that Buffon ascribed these forces to the "ordered juxtaposition of molecules which arises from the ordered nature of the inner form." Therefore, according to Driesch, although Buffon's *evolutionistic theory of development* is analogous to Darwin's *theory of pangenesis*, it is still not a proper "*machine theory*" because Buffon's idea concerning "the formation of the germs is effected by peculiarly vital forces."

Furthermore, the *moule interne* is a force quite as specific as gravitation." Buffon postulated, explained and believed that there was a "special life-force" (op. cit., Driesch, 1914, pp.41-42).

Albert Haller (1708-1777) and Charles Bonnet were two famous Pre-formationists. In the history of biology, they were well known for the argument with Wolff's Epigeneticism. Haller emphasized that irritability, contractibility and sensibility are the most important characteristics of a living animal. He disagreed with the views of Descartes and Stahl

concerning the seat of the soul. He located it in the brain medulla (op. cit., Wheeler, p.39).

John Hunter (English: 1728-1793) was a famous anatomist. He thought that there existed a "latent heat of life." Hunter dealt with life as the cause, but not the consequence of organization. These views were followed by Huxley, Treviranus, etc. (Wallace, 1914, *The World of Life*, p. 284).

E. Kant (German: 1724-1804), the great philosopher of the 18th century, like many other philosophers, changed opinions from time to time. Therefore, his opinion of Vitalism was not definite. However, according to Driesch's careful analysis, he was "very far from being a dogmatic 'parallelism'" and basically was "a phenomenalistic materialist." But "in the case of man and his actions Kant is indubitably a Vitalist, while as regards the facts of organisation he is only problematically so" (op. cit., Driesch, 1914, pp. 86 & 91).

"Kant allows the mechanical (in its exact sense) causality of nature to be clearly and indubitably infringed by the intervention of the 'soul' of the acting man." Driesch further said: "This is the reason why (as I said) Kant, at any rate for a limited field of biology, clearly is a Vitalist, a dynamic teleologist: for obviously man is part of living nature" (op. cit., p.87). It is considered that Kant could not be dealt with as the ending of the second stage or the beginning of the third stage of the old Vitalism, because he was only a limited Vitalist.

Caspar Friedrich Wolff (German, 1733-1794) was usually thought of as the "father of epigenetic descriptive embryology. ... This fact shows that it has not always been made clear that his theory of development was not only epigenetic, but, like all epigenetic theories, *also vitalistic*; ... " (op. cit., Driesch, 1914, pp.44-45).

Wolff was a very famous Epigeneticist. He strongly opposed Bonnet's and Haller's Pre-formationism. However, Wolff's Epigeneticism supposed that there was a peculiar vital force, which Wolff called *vis essentialis*, or "essential vital". He thought that this vital force acted "on inert germinal material and practically create the new organism." *Vis essentialis* can direct the epigenesis and the nutrition of the egg getting passage into the embryo before the

formation of the heart or vessels. It can also "direct the conservation of the mature body" and "unite with the agents of the inorganic" (op. cit., pp.46-47).

Wolff did not "go beyond the most general thesis established by Aristotle---that there is a generating power in nature." He considered that "his theory resembles most closely that of Stahl." However, according to Driesch, "Wolff is the clearest and deepest representative of Vitalism since Aristotle." (op. cit., pp.48-49).

During this stage unlike the first one, there was a series of very important events:

First, after the discovery of the circulation of blood, even though Harvey himself was a strong Vitalist, his strict scientific method demonstrated that certain parts of the body and their functions could be showed successfully without conceiving of a particular vital force or spirit.

Second, Descartes dealt with his dualistic attempts to combine the mind or soul with the physical body, especially the brain.

Third, the critical discoveries of Newton (1642-1727) established the laws of mechanics and astronomy. Newton, not a biologist but a physicist, was a believer in mechanics, but he also believed in the necessity of a First Cause. However, Newton's mighty influences mainly tended in the mechanistic direction as that of Descartes.

Fourth, Gottfried Wilhelm Leibniz (1646-1716), while not a biologist but a mathematician and philosopher, developed a system of philosophy which influenced biology. His philosophy, like that of Descartes and Newton, considered that nature was a mechanistic system and the spiritual sphere was originated from nature. In a metaphysical sense they were anti-materialists, but as far as nature itself was concerned, they behaved like materialists.

Fifth, E. Kant, in "the case of man and his action", was considered "indubitably as a Vitalist". However, "as regards the facts of organization", he was only "problematically so."

Hence, the influence of his mechanistic ideas was larger than that of his vitalistic ideas.

Finally, Cabanis was a good example for the argument between Mechanism and Vitalism. He asserted that the brain produces thought just like the liver and other glandular

organs produces their secretions (op. cit., Wheeler, pp.28-33).

Therefore, the whole *theory of nature*, including the *theory of Vitalism*, and the philosophy of the 17th and 18th were under the influence of mechanics and Materialism. This is the tendency of this stage. Due to the influence of Newton's mechanical force, the original terms of Vitalism, such as soul, *pneuma*, *entelecheia*, *archaei*, *blas*, *opifex*, *vis essentialis*, vital spirit, etc. were unified to a commonly accepted term: "vital force."

However, for many reasons, Vitalism was revived near the close of the 18th century. According to Needham (1969), Leibniz's views of mathematics were influenced by the Chinese ideas in the *Book of Changes or I-Ching*; and his views of philosophy were ever influenced by the ideas of neo-Confucianism (op. cit., pp.291-292).

3. Third Stage: from Blumenbach to Liebig

Near the close of the 18th century and during the beginning of the 19th century, Vitalism was being revived, even though it had been eclipsed by mechanism since the 17th century. According to Wheeler (1939), there were several reasons for this (op. cit. pp.47-48).

Firstly, the view of vitalistic epigenesis, advocated as an idea from Aristotle through Harvey, was revived by Wolff. Despite the powerful opposition of Bonnet and Haller, this important view of development and morphogenesis was gradually spread. Wolff was, by aid of his notion of *vis essentialis*, able to generally explain the development and morphogenesis of animals. His elaboration of epigenesis strengthened the belief in Vitalism.

Secondly, due to the opposition to the Pre-formationism of Bonnet and Haller, which was actually incorrect, there were also positive effects to Wolff's vitalistic view.

Thirdly, Haller's important vitalistic view of irritability, contractibility and sensibility as general properties of all living beings, was accepted by many biologists, including such

mechanists as Semon and Verworn.

Finally, the concept of "vital force" gradually became generally accepted. It was founded not only on the Epigenesism of Wolff and Blumenbach, but also on the physiology of Haller and also notably on the histology of Bichat (French, 1771-1801), which was just newly established.

Needham (1929) also took the view: "the eighteenth century closed with the general acceptance of a mild vitalism, represented by Bichat and Muller .. it was the calm before the storm." (*A Sceptical Biologist*, p.115), showing the general acceptance of Vitalism at this period.

During the close of 18th and the beginning of the 19th century, J.F. Blumenbach (German: 1752-1840), a biophilosopher and anthropologist, was a very important exponent of the revival of Vitalism. In 1787-1789, Blumenbach supported Haller's idea of vital forces, i.e. irritability, contractibility and sensibility, and his idea of Pre-formationism. He connected them together, as a *vita propria* or the "special vital activity" of organs. He later changed his opposition to Haller's Pre-formationism.

Blumenbach began to elaborate his own concept of a *nisus formativus* or a "formative impulse", which would be a particular power for all living beings. "He compares it with gravity; both are recognizable through the effects they produce; but the real cause is a hidden quality like those of other physical forces" (op.cit., Wheeler, 43). Blumenbach argued well for proof of his epigenesis, and very well for proof of his *nisus formativus* about the restitution phenomena in *Hydra* and the healing of large wounds.

According to Driesch, the second period of the old Vitalism was started with Harvey and ended with Blumenbach. Driesch gave a high praise to Wolff and "above all" to Blumenbach. This author agrees with Driesch's praise to Wolff and Blumenbach. However, he does not agree with Driesch's belief that the second period ended with Blumenbach. It appears more logical to see Wolff ending the second period and Blumenbach beginning the

third period, because Blumenbach worked so far into the middle of the 19th century.

P.J.G. Cabanis (French: 1757-1808) first adopted purely materialistic views. He initially thought that " 'the brain produces thought' just like the liver and other glandular organs produce their typical secretions ... " However, Cabanis eventually abandoned the materialistic views, and " went to the vitalistic school of G.E. Stahl " (op. cit., Wheeler, p.32).

J.C. Reil (1759-1813) was a nature-philosopher. Driesch described him as " a clear-headed biologist trained in the philosophy of his age". Reil was also described by Driesch as " the first representative of a vitalistic theory founded on the concept of living matter." This living matter could be called " vital matter", which was based on the endowment of the matter with the idea." (op. cit., Driesch, 1914, pp.98-100; Wheeler, p.56).

M.F.X. Bichat (French: 1771-1801) was the founder of histology, a new branch of biology in his time, and he supported Vitalism. Bichat believed that some peculiar vital forces, existed, called *proprietes vitales*, and that these were similar to gravity, elasticity, and other recognizable physical forces.

G.R. Treviranus (1776-1839) was also a nature-philosopher. He accepted Kant's theory of matter, but regarded life as " something entirely extraneous." This external factor was a spiritual nature, called *nous*. He called the vital force *vis vitalis*. This force shared with the external factor for the energizing of " formless life-substance." The nature of life consisted in the power, giving " relative uniformity to the absolute irregularity of external agents."

Treviranus supported the view that vital force and matter were " determined reciprocally the one by the other." He thought that " something unconscious is the primary cause of life," which affected both body and spirit (Driesch, 1914, pp.100-106 ; Wheeler, pp. 56-57).

J.J. Berzelius (Swedish: 1779-1848) was one of the vitalistic chemists. In the third stage, Vitalism came to be best expressed not by philosophers, but by chemists and physiologists; and there was a so-called "*Chemical Vitalism School*". Berzelius, Muller, and Liebig were three outstanding representatives. Berzelius believed that there existed a vital force

acting in living beings. This process, he believed, could not be reproduced in laboratory. In an early stage, he also believed that inorganic compounds could be synthesized by chemists, but organic compounds could not. However, he changed his ideas as chemical knowledge advanced.

Johannes Peter Muller (German: 1801-1858) was a vitalistic anatomist, zoologist, and especially strong as a physiologist. He made physiology more exact and broader, and used all possible methods in his research. He also made integrations between physiology and psychology, and developed a new field in biology (Locy, 1930, *Biology and Its Makers*, pp.185-186).

A major contribution, important in the history of Vitalism, was his concept of the "principle of specific nerve energies" in his experiments. This principle "states that each sensory nerve gives rise to the particular type of sensation which its distal end is adapted to register and to no other, whatever the nature of the stimulus it may receive; so that the sensation produced by a stimulus varies only with the nerves and sense organs affected." This principle, as Singer (1950) said, "remains one of the corner-stones of vitalistic theory" (op.cit.p.390; Wheeler, p.63). However, it can also be thought as a mechanistic view.

Justus von Liebig (German: 1803-1873) was one of the great vitalistic chemists and physiologists. In his two famous books, *Letters on Chemistry* (1844, 1859) and *Animal Chemistry* (1843), he clearly expressed his vitalistic views and strongly supported Vitalism. He believed that chemists could synthesize many organic compounds and would make more in the future.

However, he also pointed out that chemists could never be able to synthesize "an eye, a hair, or a leaf." Because the functions of these tissues, organs, and systems were so wonderfully correlated, there must be an organizing power or vital force to organize and control the whole organism.

Liebig stated that in animal ova, tissues and organs, plant seeds and organs, "we

recognize the *vital force*, *vis vitae*, or *vitality* "; and in animals " in the nervous apparatus a source of power " (*Animal Chemistry* , pp.1-3). However, nerves did not produce vital force, rather they conducted it (op. cit., p.260).

Liebig described the different degrees of autonomy in plants and animals, which was similar to that of Aristotle. He also noted a " higher phenomena of mental existence ", much like Aristotle's " rational soul". He thought that both consciousness and intellect were " a peculia resource of increased energy or of disturbance " (op. cit., pp.3-7).

Liebig also thought that animal life was determined by changes in food and oxygen " under the influence of the vital force", but ultimate causes were chemical forces. He held that, in the conservation of energy, all animal heat was due to chemical action between oxygen and food material (op. cit., pp.9-12, 31-38).

According to Liebig, it is only vital force that causes an animals' growth and resistance to the external factors which tend to damage the organism, and that it also causes motion and changes the form and structure of substances by altering the state of the chemical forces of the body. This force can be either kinetic or potential, being similar to chemical forces and electricity. However, " it is a peculiar force" and chemical energy is not the cause of vital phenomena (op. cit., pp.196-209, 232).

According to Singer (1950), Liebig " was convinced that all vital activity could be explained as the result of chemical or physical factors " (op. cit., p.373). However, according to Driesch, Liebig recognized that vitalists often went too far in their claims, but he held that their view was more correct than that of the mechanical school (Driesch, 1914, p.119; Wheeler, pp.60-62). The major contribution of Liebig was that he made the vital force more deeply connected with the biochemical processes of the organism. However, although Liebig distinguished the vital force as a special force different from the chemical (here better to say biochemical) force, he did not actually realize the close relationship between these two forces. According to Buddhism, these two forces are actually closely related. They may be the same

origin, the "real-nature" or "true-exist."

Liebig's vital force and chemical / biochemical force may be said corresponding to life-energy and bio-energy, respectively, which we have proposed. It may be said that Liebig was not only one of the great vitalistic chemists but also the greatest vitalist in the middle of the 19th century.

In the later stages of Liebig's life, in the field of physics and chemistry as well as in the field of biology, there were two great events by which Vitalism was eclipsed and Mechanism waxed strong. Thus, Vitalism was again depressed as in the 17th century, until the end of the 19th century when Driesch revived it again.

These two events were: first, the dramatic proof of the conservation of energy in physics and chemistry by R. Mayer (German: 1814-1878) in 1842, as well as J.P.Joule (English: 1818-1889) and H.von Helmholtz (German: 1821-1894) in 1847, independently (op.cit. Wheeler, pp.70-7); and second, the establishment of the theory of evolution in biology by C. Darwin in 1859.

According to the experimental result of two American scientists at U.S. Department of Agriculture (USDA) in 1903, the law of the conservation of energy is also fitted to living beings including human (op. cit., Wheeler, pp.72-73). Since then, there was not much further belief in main stream of Western science for the "special vital-force" in living beings.

Such conclusion must be made on two suppositions: (1) the "special vital-force" and energy are two different things, and (2) the "special vital-force" must be able to produce "new energy," if not, then it is proved that the "special vital-force" does not exist. Since the experimental result of the USDA indicated that living beings, including human beings, could not produce "new energy", therefore, it was concluded that there was no "special vital-force."

This conclusion seems very scientific. However, the questions still can be raised: why must the "special vital-force" be able to produce new energy, why can it not be also conserved

? If the above two suppositions are not true, or in other words, if the "special vital-force" is also conserved and it is not absolutely different thing from energy, then the original conclusion is incorrect.

According to the buddhist theories (see *The Heart Sutra*) and the Buddhist laws (see Chapter 1), the "special vital-force" must also be conserved and it is not absolutely different thing from energy, therefore, the original conclusion seems to be needed to re-examine and reconsidered and to make some new decisions to attain a new scientific realm.

We have to realize that a very important rule is that the nonmaterial entity, like the special vital-force, can not be measured using material equipment. If the conclusion is not made according to this rule, then it will be useless.

Another problem concerns the theory of evolution. According to this theory, all living things and their functions, including Aristotle's sensitive faculties and mental spirit, are the products of evolution. Even the mind and thought are the evolutionary products of the brain. Thus, the "special vital force" has been replaced by " evolution".

Now, how can we integrate the "theory of evolution" and the " law of conservation of energy " with the ideas of Buddhism ? Are " energy " and " special vital force" really two different kinds of things ? Does "evolution" really "produce" actual "new" things ? These very basic and important questions will be discussed in Part III.

Chapter 11 Driesch's Neo-Vitalistic Theory

I. Introduction

1. Definition

The originator of neo-Vitalism was Hans Driesch (German: 1867-?), and he defined its definition as " The newest phase in the history of Vitalism has been termed Neovitalism, ..." (Driesch, 1914, p.170). But we also call his Vitalism neo-Vitalism, because besides the time factor of his "newest phase", there are following three other factors. (1) Driesch expressly emphasised Aristotle's idea of *entelecheia* (entelechy), but he did not stress Aristotle's ideas of soul and *Pneuma*. (2) Not only had he used traditional inductive and deductive logical methods, but also he used experimental methods to try to identify entelechy. (3) He strongly emphasised the idea of the autonomy of life and dynamic teleology, but did not affirm the idea of traditional static teleology.

Therefore, Driesch's neo-Vitalism can also be defined as " the autonomy theory of life and dynamic teleology."

2. Background

Driesch much emphasized one of the characteristics of his neo-Vitalism by testing with some special experimental methods. However, he did not actually first start to do the experimentations. Driesch was greatly influenced by several pioneers, William Roux, Gustav Wolff, Hertwig and Boveri, who had done some experimental work before him. Driesch used

some of their methods and ideas as a basis for his own experiments. Therefore, he gave credit mainly to Roux as the earliest real establishment of neo-Vitalism. He said:

The cause of the real establishment of Neovitalism was, as we have mentioned, the reappearance of experimental morphology, the 'mechanics of development' represented by W. Roux. ... William Roux should be mentioned as the earliest Neovitalist, for he has repeatedly mentioned that, at least in functional adaptation, organic development is directly influenced by non-mechanical or psychical factors (op. cit., Driesch, 1914, pp.171-173).

But, because " Roux merely took over these views as a legacy from certain earlier theories" and he possessed no other characteristics like that of Driesch, Roux should only be " in considering him in fact as a traditional vitalist " (ibid). Thus, we deal with Driesch as the originator or the founder of neo-Vitalism.

Driesch's other pioneer, G. Wolff, was an anti-Darwinist. He followed his critique of Darwinism by a simple experiment, which he considered to be a solution to the question about teleology and Darwinism. Wolff hoped that the positive outcome of the experiment proved the "primary finality" of teleology. A simple experiment was done by the extraction of the lens from the eye of a newt to examine whether the lens could be restored. It was noted that a new lens finally was generated from the outer edge of iris. Thus, Wolff believed that "primary finality " had been demonstrated. Driesch was inspired by Wolff's experiment (op.cit., 1914, pp.174-175). However, Wolff never dealt with the differences between dynamic and static teleology. Although certainly inclined to Vitalism, he could not be said to be a neo-Vitalist.

As to Hertwig and Boveri, because Driesch only took some advantage of their experimental material, the sea-urchin, and their experiments were only for cytological goals, and they did not have the obvious idea of Vitalism, so, they also could not be looked upon as the originators of neo-Vitalism.

II. Life and Entelechy

I. Meaning of Life

In Driesch's view of neo-Vitalism, what is the basic meaning of life ? Driesch held that:

Life is unknown to us except in association with individual bodies: we only know living individuals and call them organisms. It is the final object of all biology to tell us what it ultimately means to say that a body is 'living', and in what sorts of relation body and life stand one to the other. ... But at present it is enough to understand the term 'individual body' and 'living' in the ordinary and popular sense (Driesch, 1929, p.6).

According to Driesch, there were three features of life or "individual body" and "living":

All living bodies are specific as to form --- they 'have' a specific form, ... All living bodies also exhibit metabolism; that is to say, they stand in a relation of interchange of materials with the surrounding medium, they take in and give out materials, but their form can remain unchanged during these processes. And, in the last place, we can say that all living bodies move; though this faculty is more commonly known among animals only (ibid).

It is unfortunate that Driesch did not talk about two other basic features of life: inheritance and evolution. Among these basic features of life, Driesch emphasized "form" more. He said:

Living bodies are not simple geometrical forms, not, like crystals, merely a typical arrangement of surface, to be reduced theoretically to an arrangement of elemental particles.

Living bodies are *typically combined* forms; that is to say, they consist of simpler parts of different characters, which have a special arrangement with regard to one another; these parts have a typical form of their own and may again be combinations of more simple different parts.

But besides that, living bodies have not always the same typically combined form during the whole of their life: they become more complicated as they grow older; they all begin from one starting-point, which has little form at all, viz. the egg.

So the living form may be called a "genetic form", or a form considered as a process, and therefore *morphogenesis* is the proper and adequate term for the science which deals with the laws of organic forms in general; ... (Driesch, 1929, p.8).

Driesch called "the morphogenetic processes leading from the egg to the adult" as the "physiology of development". "But living forms are not only able to originate in one unchangeable way: they may restore themselves, if disturbed"; thus, he called this the "physiology of restoration or restitution" (ibid).

Here, we can see how Driesch emphasized his ideas of "morphogenesis" and "form." In his definitions and explanations of the idea of "form," its meaning was actualized further than Aristotle's concepts, who in turn had actualized it from the idea of Plato. It may be said that this is the "formless" influence from the materialistic ideas since Newtonian mechanics. Thus, Driesch said: "we may decide one very important question about life merely by an analysis of individual form production." In other words, life is the production of "individual form" (ibid).

However, today, it is still worthy to think about Driesch's serious question: "whether 'life' is only a combination of chemical and physical events, or whether it has its elemental laws, laws of its own" (ibid).

Under the influence of Wigand and Bois-Reymond, Driesch also came to clearly understand that "teleology is an irreducible peculiarity of the phenomena of life." He dealt with a general formula of the causality as $C = f(E)$, in which C indicates Cause and E indicates Effect. Driesch also dealt with the general formula of teleology as $M = f(A, S)$, in which M

indicates Medium, and A. S. Antecedent and Consequent, respectively (op.cit., 1914, pp.176, 179).

Standing on both his experiments and his theory, Driesch answered the most central and basic problem in biophilosophy: what is life ?

No kind of causality based upon the constellations of single physical and chemical acts can account for organic individual development; this development is not to be explained by any hypothesis about configuration of physical and chemical agents. Therefore there must be something else which is to be regarded as the sufficient reason of individual form-production (op. cit., p.105).

2. The Meaning of Entelechy: A Factor of Life Autonomy

We have mentioned above that Driesch's idea of "form" was further actualized or materialized than that of Plato and Aristotle. The original meaning of "entelechy", i.e. Aristotle's *entelecheia*, is "actuality" or "the first actuality", in other words, the full realization of form-giving cause, as contrasted with *energeia* being merely potential existence. Now, what is Driesch's concept of "entelechy" ? It has also been totally changed. Driesch said:

Let us then borrow our terminology from Aristotle, and let that factor in life phenomena which we have shown to be a factor of life autonomy be called *Entelechy*, though without identifying our doctrine with what Aristotle meant by the word *entelecheia*. We shall use this word only as a sign of our admiration for his great genius; his work is to be a mould which we have filled and shall fill with new contents. The etymology of the word *entelecheia* allows us such liberties, for indeed we have shown that there is at work a something in life phenomena 'which bears the end in itself', ... (Driesch, 1929, p.106).

It is express that in Driesch's morphogenesis " there is at work a something" " which bears the end in itself." This " something" " at work " is *entelechy* . Driesch further said:

Our concept of entelechy marks the end of our analysis of individual morphogenesis. Morphogenesis, we have learned, is 'epigenesis' not only in the descriptive but also in the theoretical sense: manifoldness in space is produced where no manifoldness was, real 'evolutio' is limited to rather insignificant topics (op. cit., p. 106-107).

In other words, the "manifoldness" is the action of entelechy in the process of morphogenesis. "But was there nothing 'manifold' previous to morphogenesis?" Driesch asked, and he answered:

Nothing certainly of an *extensive* character, but there was something else: there was entelechy, and thus we may provisionally call entelechy an "*intensive manifoldness*". That then is our result: not evolutio, but epigenesis--- "epigenesis vitalistica" (ibid).

Therefore, the action of entelechy is both *manifold* and *intensive*. Driesch also made some other definitions for entelechy: "Entelechy is an agent *sui generis*, non-material and non-spatial, but acting 'into' space, so to speak; an agent, however, that belongs to nature in the purely logical sense in which we use this word." or " 'Entelechy', as a non-mechanical agent of nature, is at work in the harmonious-equipotential system " (op. cit., pp. 204, 210). Something expresses a *true element of nature* and a *true agent of life*, that actually is "entelechy." Driesch further said:

Life, at least morphogenesis, is not a specialised arrangement of inorganic events; biology, therefore, is not applied physics and chemistry: life is something apart, and biology is an independent science (ibid).

To sum up: Specificity of organic form does not go hand-in-hand with specificity of chemical composition, and therefore cannot depend on it; and besides that, specific organic form is such that it can never be explained by atomic or molecular arrangement in the chemical sense; for, to state it in a short but expressive manner, the 'form' of an atom or molecule can never be to go beyond the limits of chemistry in chemistry itself (op. cit., pp. 101-102).

Thus, it can be summed up that: Entelechy is a non-material, non-spatial, and non-mechanical autonomous agent, as well as an intensive manifoldness, which acts into material and space and works in the harmonious-equipotential system of living beings to regulate or direct the vital processes.

3. The Experimental Test of Entelechy

According to Driesch, there are two ways to prove entelechy / life autonomy or neo-Vitalism: the experimental and logical. The first experimental way is basically mentioned here. It is based on the experimental research of the developmental process of morphogenesis. Driesch mainly did three kinds of experiments.

3-1. The First Experimental Test: Separating Blastomeres

Driesch's experimental testings of entelechy / life autonomy / neo-Vitalism were actually accompanied with the disproof of Weismann's development theory. Weismann's theory consists of two parts: one relates to morphogenesis and the other to heredity; and only the first is considered here. According to Driesch:

Weismann assumes that a very complicated organised structure, below the limits of visibility even with the highest optical powers, is the foundation of all morphogenetic processes, in such a way that, whilst part of this structure is handed over from generation to generation as the basis of heredity, another part of it is disintegrated during the individual development, and directs development by being disintegrated. The morphogenetic structure is assumed to be present in the nucleus of the germ cells, and Weismann supposes the disintegration of his hypothetic structure to be accomplished by nuclear division. By the cleavage of the egg, the most *fundamental* parts of it are separated one from the other (op. cit., pp.34-35).

There are several copies, according to Weismann, of these morphogenetic structures, and one copy at least is disintegrated during ontogeny. Driesch described:

At the end of organogenesis the structure is assumed to have been broken up into its elements, and these elements, each of them localised in a particular cell, determine the fate of the single cells of the adult organism, the whole process having been accompanied by growth (ibid).

According to Driesch, "Weismann's theory resembles to a very high degree some of the old "evolutio" doctrines of the eighteenth century; ..." Driesch argued with Weismann's theory and he did his own experiment to check it.

However, before Driesch started his experiment, Roux did his experiment first. Roux, almost independently from Weismann, claimed a theoretical view of morphogenesis which was very closely related to that of Weismann. Roux's purpose, in his experiment, was to prove that "there exists a very complicated structure in the germ, and that nuclear division leads to the disintegration of that structure." By the aid of a hot needle, Roux killed one of the two blastomeres of the frog's egg which had fully accomplished its first cleavage. As a result, a typical half-embryo and then a half-organism emerged. Such an organism was "as much a half as if a full-formed embryo of a certain stage had been cut in two by a razor" (op.cit., pp.37-38).

What did Driesch think about the result of this historical creative experiment? Driesch said:

That seemed to be a proof of Weismann's and Roux's theory of development, a proof of the hypothesis that there is a very complicated structure which promotes ontogeny by its disintegration, carried out during the cell divisions of embryology by the aid of the process of nuclear division, the so-called 'karyokinesis'. But things were far from being decided in a definitive manner (op. cit., p.38).

It is obvious that Driesch had a different point of view. He did not think that Roux's experimental result proved Roux's and Weismann's ideas of development. Driesch wanted to take advantage of Hertwig's and Boveri's experimental material, i.e. the eggs of sea-urchin (which are able to tolerate many kinds of rough treatments), and methods, i.e. by shaking the cleaving fertilized egg to kill one of the two cells (blastomeres) or separate them, to repeat Roux's experiment. Driesch shook the two-celled cleavage fertilized sea-uechin eggs rather violently. In several cases, he succeeded either in killing one of the two blastomeres, or in separating the two blastomeres from each other (op.cit., p.38). Then, one of the two blastomeres underwent the following developmental processes:

It went through cleavage just as it would have done in contact with its sister-cell, and there occurred cleavage stages which were just half of the normal ones. The stage, for instance, which corresponding to the normal sixteen-cell stage, and which, of course, in my subjects was built up of eight elements only, showed two micromeres, two macromeres, and four cells of medium size, exactly as if a normal sixteen-cell stage had been cut in two; and the form of the whole was that of a hemisphere. So far there was no divergence from Roux's results (ibid).

However, some strange thing happened. The development of the hemisphere proceeded rather rapidly, and cleavage was accomplished in about fifteen hours. According to Driesch's observation:

I quickly noticed, on the evening of the first day of the experiment, when the half-germ was composed of about two hundred elements, that the margin of the hemispherical germ bent together a little, as if it were about to form a whole sphere of smaller size, and, indeed, the next morning a *whole* diminutive blastula was swimming about. I was so much convinced that I should get Roux's morphogenetical result in all its features that, even in spite of this whole blastula, I now expected that the next morning would reveal to me the half-organisation of my subject once more; But things turn out as they were bound to do and not as I had expected; there was a typically *whole* gastrula on my dish the next morning, differing only by its small size from a normal one; and this *small but whole* gastrula was followed by a whole and typical small pluteus-lava (op. cit., p.39).

This experimental result just satisfied Driesch. Therefore, he said:

That was just opposite of Roux's result: one of the first two blastomeres had undergone a half-cleavage as in his case, but then it had become a whole organism by a simple process of rearrangement of its material, without anything that resembled regeneration, in the sense of a completion by budding from a wound. ... This was a very important result, sufficient alone to overthrow at once the theory of ontogenetic 'evolutio' (op. cit., p.40).

Thus, it seems that experimental evidence disfavors the ideas of Roux and Weismann. The evidence shows that there is no demonstration of disintegration and direction, as Roux and Weismann supposed, but there is something to regulate, as Driesch supposed, embryonic development and morphogenesis.

Then, Driesch did some further experiments. After widening the circle of his observations, he further demonstrated" that one of the first *four* blastomeres is also capable of performing a whole organogenesis, and that three of the first four blastomeres together result in an absolutely perfect organism..." " By raising the temperature of the medium or by diluting the sea-water to a certain degree," Driesch proved that it is " to be possible to alter in a rather fundamental way the type of the cleavage-stages without much damage to the resulting organism;" and that there " may be no micromeres at the sixteen-cell stage, or they may appear as early as in the stage of eight cells; no matter, the larva is bound to be typical." Thus, the third experimental result leads Driesch to attain another conclusion: " So it certainly is not necessary for all the cleavages to occur just in their normal order " (ibid). This conclusion is not central to Driesch's theory, however, it does show that the order of the cleavage of blastomeres may also be regulated by something during the processes of development and morphogenesis.

3-2. The Second Experimental Testing: Pressing Blastomeres

On the bases of the above experiments, Driesch did not only follow the experimental methods of others, but rather designed another new kind of method by himself. Then, some other important things for Driesch's purposes followed in his further experiments.

I succeeded in pressing the eggs of *Echinus* between two glass plates, rather tightly, but without killing them; the eggs became deformed to comparatively flat plates of a large diameter. Now, in these eggs all nuclear division occurred at right-angles to the direction of pressure, ... but the divisions *began* to occur at right-angles to their former direction, as soon as the pressure ceased. ... If, for instance, I kept the eggs under pressure until the eight-cell stage was complete, I got a plate of eight cells, one beside the other, instead of two rings, of four cells each, one above the other as in the normal case; but the next cell division occurred at right-angles to the former ones, and a sixteen-cell stage, of two plates of eight cells each, one above the other, was the result (op. cit., p.40-41).

Driesch kept this kind of pressure experiment till sixteen-cell stage, and the situation was similar. All of these treatment resulted in "*absolutely normal* organisms".

Thus, Driesch concluded:

It is clear that the spatial relations of the different nuclear divisions to each other are anything but normal in the eggs subjected to the pressure experiments; that, so to say, every nucleus has got quite different neighbours if compared with the 'normal' case. If that makes no difference, then there *cannot* exist any close relation between the single nuclear divisions and organogenesis at all, ..." (op. cit., pp.41-42).

It is believed that the result of this experiment also demonstrates the effect of regulation on cell position, from the abnormal restoring the normal during the process of development and morphogenesis.

Now, it can be concluded that, in Driesch's experiments, the most meaningful one is the isolation of blastomeres. This result may actually be similar to "single egg twins" in human. However, Driesch showed this by artificial experiment, although only in a lower animal.

Driesch explained his main experimental results as follows:

Nuclear division, then, cannot be the basis of organogenesis, ... there *must* be somewhere *in* the egg itself a certain factor which is responsible at least for the general orientation and symmetry of it." By consideration of this, Driesch urged his hypothesis that "there existed, that there *must* exist, a sort of intimate structure in the egg, including polarity and bilaterality as the chief features of its symmetry, a structure which belongs to every smallest element of the egg, and which might be imagined by analogy under the form of elementary magnets. This hypothetic structure could have its seat in the protoplasm only." (op. cit., p.43).

As we have known, Weismann's "complicated micro-structure" was supposed to be located in the nucleus, however, according to Driesch, his "intimate structure" was supposed to be located in "protoplasm" (better to say "cytoplasm", because the idea of "protoplasm" actually includes both cytoplasm and nucleus). Thus, in order to further prove that his "intimate structure" was really located in cytoplasm, Driesch did a cytoplasm-cutting experiment:

We succeeded in cutting away a certain mass of the protoplasm of the ctenophore egg just *before* it began to cleave, without damaging its nuclear material in any way; in all cases, where the cut was performed at the side, there resulted a certain type of larvae from our experiments which showed exactly the same sort of defects as were present in larvae developed from one of the first two blastomeres alone (op. cit., p.44).

By the result of this experiment, Driesch believed: "The hypothesis of the morphogenetic importance of *protoplasm* had thus been proved." He also emphasized the result of T.H.Morgan directly obtained by repeating Roux's frog egg experiment:

Morgan, after having killed one of the first two blastomeres, as was done in the original experiment of Roux, was able to bring the surviving one to a half or to a whole development according as it was undisturbed or turned (op. cit., p.45).

Therefore, Driesch believed: " There cannot be any doubt that in both of these cases it is the possibility of a rearrangement of protoplasm, offered by the turning over, which allows the isolated blastomere to develop as a whole." (ibid). However, between these two cases there were some differences. Thus, Driesch called the case of sea-urchin egg *obligatory*, and the case of frog egg *facultative*. It is also interesting to note that " the first two blastomeres of the common newt, ... after a separation of *any* kind, *always* develop as wholes, their faculty of regulation being obligatory, like that of *Echinus*." (ibid). This means that this kind of phenomenon possesses certain generality.

On the basis of these experiments, Driesch further explained his hypothesis:

Whole or partial development may thus be dependent on the power of regulation contained in the intimate polar-bilateral structure of the protoplasm. The development becomes a half or a quarter of the normal because there is only one-half or one-quarter of a certain structure present, one-half or one-quarter with regard to the very wholeness of this structure; the development is whole, in spite of disturbances, if the intimate structure became whole first (ibid).

In addition, Driesch also described different hierarchies of the cytoplasmic intimate structure. He divided them into three: the "wholeness", "halfness" and "quarterness". Then, he further expressed them in a mathematical way, by using three axes, x,y, and z, at right angles to each other, as the basis of orientation according to the polarity and bilaterality of the egg (Fig. 11-3). To each of these axes, a certain specific state corresponds with regard to symmetrical relations.

Then, Driesch explained:

It follows that, if there are wanting all those parts of the intimate structure which are determined, say, by a negative value of y , by minus y , then there is wanting half of the intimate structure; and this halfness of the intimate structure is followed by the halfness of organogenesis, the dependence of the latter on the intimate structure being established. But if regulation has restored, on a small scale, the whole of the arrangement according to all values of x , y , and z , development also can take place completely (op. cit., pp.45-46).

On the basis of the embryonic experiment, Driesch concluded:

The theory of the 'qualitatively unequal nuclear division' certainly was not true, and that there was no strict 'evolutio' in protoplasm. Hence, Weismann's theory was clearly disproved. There certainly is a good deal of real 'epigenesis' in ontogeny, a good deal of 'production of manifoldness', not only with regard to visibility but in a more profound meaning (op. cit., p.48).

However, Driesch did not absolutely disagree with 'pre-formationism'. He said:

But some sort of pre-formation had also been proved to exist, and this pre-formation, or, if you like, this restricted 'evolutio', was found to be of two different kinds. First an intimate organisation of the protoplasm, spoken of as its polarity and bilaterality, was discovered, . . . Besides that, there were cases in which a real specificity of special parts of the germ existed, a relation of these special parts to special organs; but this sort of specification also was shown to belong to the protoplasm (op. cit., pp.48-49).

Driesch's experiments showed that the organisation of protoplasm and its bearings on morphogenesis behave rather differently in the eggs of different animals. Driesch thought : "The differences in the degree of regulatability of the intimate germinal structure may easily be reduced to simple differences in the physical consistency of their protoplasm." (op. cit., p.49).

3. The Third Experimental Testing: Cutting Blastula and Gastrula

Besides the fact that one of the first two, or one of the first four, or three of the first four blastomeres together may develop a whole organism, Driesch mentioned two additional pieces of experimental evidence.

The swimming blastula, consisting of about one thousand cells, when cut in two quite at random, in a plane coincident with, or at least passing near, its polar axis, may form two fully developed organisms out of its halves. If you bisect the gastrula of sea-urchin, when it is completely formed, or, still better, if you bisect the gastrula of the starfish, either along the axis or at right-angles to it, you can get complete little organisms developed from the parts... (op. cit., pp. 54-56).

Thus, the morphogenetic developmental possibilities are not only restricted at the blastomere stage.

III. Analytic and Autonomic Morphogenesis

I. The Ideas of Intimate Structure and Potentiality

Based on these evidences mentioned above, Driesch developed his idea of intimate structure to another idea, that of potency or potentiality. He further divided this into two concepts: the "prospective potency", i.e. the *possible fate* of each embryonic elements; and the "prospective value", i.e. the *real fate* of each embryonic elements. Then he raised the question: whether " the prospective potency of each embryonic part is fully given by its prospective value in a certain definite case, or the prospective potency contains more than the prospective value of an element in a certain case reveals." According to Driesch 's experimental results, they showed that " the prospective potency of embryonic parts, at least in certain cases, can exceed their prospective value, ..." (op. cit., p 53).

On the basis of the idea of potency or potentiality, Driesch raised two other concepts: the "morphogenetic system" and the "equipotential system". According to Driesch, the term *system* was "borrowed" from mechanics, and " call any part of the organism which is considered as a unit from any morphogenetic point of view, a morphogenetic '*system* '." And " both the blastoderm of echinoderms, at least around its polar axis, and also the germ-layers of these animals, are 'systems' possessing an equal potentiality in all of their elements"; these "systems" are called "equipotential system" (op. cit., p.86).

One wonders why Driesch's equipotential systems did not include the two-celled and four-celled, at least, cleavage eggs, they should also be part of these systems.

According to Driesch, the "equipotential system" consists of two situations: the "singular-equipotential system" and the "indefinite-equipotential system". Driesch noted:

Our systems are equipotential to the extent that each of their elements may play every *single* part in the totality of what will occur in the whole system; ... We therefore might call our systems equipotential systems with single potencies; or, more shortly, *singular-equipotential systems*.

The proper act to be performed by every element in each actual case is, in fact, a single one, but the potency of any element as such consists in the possibility of *many* single acts; that, then, might justify us in speaking of our system as *indefinite-equipotential systems* (op. cit., p.87).

2. Morphogenetic Harmony and Harmonious-Equipotential-System

Driesch again raised other two ideas, namely, "morphogenetic harmonies" and "harmonious-equipotential-system". "Morphogenetic harmonies" mean that there exists "some morphogenetic interactions among the parts of a developing embryo"; and that "the development of each embryonic part depends on the existence or development of every other one." These harmonies further consist of three, including: (1) the "harmony of constellation", which is shown by "the fact that there is a whole organism at the end, in spite of the relative independence of the single events leading to it "; (2) the "causal harmony", which "expresses the unfailing relative condition of formative causes and cause-recipients "; and (3) the "functional harmony", which is "an expression descriptive of the unity of organic function."

According to Driesch:

Individual morphogenesis is marked by a *threefold harmony* among its parts. ... The three sides or parts of this threefold harmony are united in a very close way. They penetrate one another, as it were. For the embryological process lays the foundations of all the future functions of the adult; and, on the other hand, that process itself depends on a harmony of functions, every embryonic stage being also a functioning totality. We must never forget that the organism is in each of its stages a unity of form and function, these two features being dependent on one another (op. cit., pp.78-79).

Thus, we see that the idea of morphogenetic harmony was very important in Driesch's theory. Driesch described the "harmonious-equipotential system" as follows:

There are indeed, indefinite singular potencies at work in our systems during ontogeny; ... there exists a sort of inner harmony in every case among the *real products* of our systems exclusively. The term *harmonious-equipotential system*, therefore, seems to be the right one to denote them.

We know already that many of the elementary morphogenetic organs have been really proved to be harmonious-equipotential systems, and that the same probably is true of many others; we also know that the immature egg of almost all animals belongs to this type; (op. cit., p.91).

3. The Ideas of the Mean of Morphogenesis and the Cause of Stimulus

Further more, Driesch raised and analyzed two other ideas: the "means of morphogenesis" and the "causes of stimuli". Driesch explained" the word 'means' being preferable to the more usual one 'condition' in this connection, as the latter would not cover the whole field. ..." He further said: "what is usually called 'condition' is part of the morphogenetic means in our sense. We may say that morphogenetic *means* are circumstances which are necessary for a complete morphogenesis." (op. cit., p.62). What is the definition of "cause" ? Driesch defined in this way:

We may call the 'cause' of any event, the *sum total* of all the constellation of facts which must be completed in order that the event may occur; each single elementary process or development not only has its specification, but also has its specific and typical place in the whole --- its *locality*, ... we shall call the 'cause' of a single morphogenetic process, that occurrence on which depends its *localisation*, whether its specific character also partly depends on this 'cause' or not (op. cit., pp.68-69).

Then, what is the definition of "stimulus" ? Driesch defined it as " the cause almost always will be of the general type which usually is called a stimulus" (op.cit., p.69). Is there any quantitative correspondence between 'cause' and morphogenetic effect ? Driesch's answer was negative. Driesch summarised his ideas of "potency", "means", and "cause" or "stimulus" as follows:

'Potency ' is the real basis of the specific character of every act in morphogenesis, and 'means', including conditions, are the sum of all external and internal general circumstances which must be present in order that morphogenetic processes may go on, without being responsible for their specificity or localisation. ... There is no quantitative correspondence between our 'cause' and morphogenetic effect (ibid).

Concerning the stimulus, Driesch also further divided into two types: the "formative stimulus" and the "directive stimulus". The former was again distinguished between the external and the internal. According to Driesch, in plants, light and gravity can be looked as the "external formative causes or stimuli". One embryonic part causing another to appear can be looked as the "internal formative cause or stimulus"; such as, the skeleton of sea-urchin pluteus can give an informative stimulus to cause the formation of its arms --- if there is no skeleton, no arms (op. cit., pp.70-71). Driesch used geotropism, the root bending away from the light and towards the ground, and heliotropism, the branch behaving just in the opposite way of the root, as the examples of "external directive causes and stimuli". And among the growing or wandering parts of the embryo, " their growth or their migration may be determined by the typical character of other parts", and the " real morphogenetic characters can be the result of some such relation." There may be a kind of "chemotropism" or "chemotaxis" at work here. This may be looked upon as the "internal directive causes or stimuli." (ibid).

Driesch dealt with the important discovery of Spemann in Triton, so-called *organiser*, i.e. certain cells near the dorsal lip of the gastrula, which after implanting can make other embryonic cells equal to itself, also as the formative stimulus. Driesch thought:

The discoveries of the Spemann school have shown the embryo of Triton to be *equipotential* in an unexpected degree. Not only is every elementary organ equipotential in itself, as we already know, but the so-called germ layers---in their 'presumptive' state at least, i.e. as long as they have not yet reach their typical histological structure---are equipotential with regard to one another (op. cit., p.74).

Now, upon these three elementary concepts, i.e. the prospective potency, the means, and the formative stimulus, Driesch founded his *analytic or autonomy theory of morphogenesis*. Driesch emphasized:

We have analyzed morphogenesis into elementary processes, means, potency, formative stimulus, just as the physicist analyses mechanics into time, velocity, mass, and force; we have then rearranged our elements into 'systems'---the equipotential systems, the harmonious- equipotential system in particular, just as physicist composes his elements into the concepts of momentum or of kinetic energy or of work. And finally, we have discussed our compositions and have obtained our result, just as the physicist gets his ultimate results by discussing work and kinetic energy and momentum (op. cit., p.107).

Although Driesch compared his work with mechanics, he also emphasized the differences between biology and physics. He claimed:

Of course the comparison is by no means intended to show that mechanics and biology are sciences of the same kind. In my opinion, they are not so at all; but nevertheless there do exist similarities of a logical kind between them (op. cit., pp.107-108).

4. Concluding Remarks

Driesch finally concluded:

What we have proved to be true has always been called *vitalism*, and so it may be called in our days again. But if you think a new and less ambitious term to be better for it, let us style it the doctrine of the *autonomy of life*, as proved at least in the field of morphogenesis (op. cit., p.105-106). Vitalism, then, or the autonomy of life, has been proved by us indirectly, and cannot be proved otherwise so long as we follow the lines of ordinary scientific reasoning (op. cit., p.106).

Up to now, we have mentioned some experimental testings, or "proofs" as said by Driesch, of his entelechy and neo-Vitalism (or the autonomy theory of life). However, all of these were only done indirectly, as Driesch himself also agreed. We have also compared Driesch's neo-Vitalism with Aristotle's old Vitalism. Yet one thing has to be emphasised here that the former may be realized or established more materialised than the latter, although Driesch claimed that his entelechy is "neither 'an energy' nor 'a material substance'" and is also "non-spatial" (op. cit., p. 204). This is natural because during Driesch's time biology, from the physical point of view, had advanced greatly since Aristotle's time. Driesch's neo-Vitalism or the *autonomy theory of life* was established on the basis of cell, tissue, and organ levels and of morphogenetic developmental processes. Further, his ideas of potency, means, regulation, formative cause of stimulus, morphogenetic system, and harmonious-equipotential system were much more developed than in Aristotle.

However, some problems still exist in Driesch's theoretical system. First, there still occurs dualistic idea. The relationships remain obscure and unsolved among entelechy, mind, material, and physical body. Second, what is the origin of entelechy and what is its past and its future? Driesch left these questions untouched. Third, Driesch emphasised the role of

protoplasm (cytoplasm), and neglected that of the nucleus. His theory built upon his intimate structure in protoplasm, however, it is invisible. The relationship between his concept of entelechy and protoplasmic intimate structure is also not very clear. If the intimate structure corresponds to entelechy and the entelechy is non-material, non-energy as well as non-spatial, how can it become a "structure" ?

Chapter 12 Organicism

I. Introduction

There are several unsolved problems in Vitalism as mentioned above. Especially, both Aristotle's *psyche* (or soul) and Driesch's entelechy can not be identified directly. At the beginning of the 20th century---a little bit after Driesch, the French author G. Delage (1903) first used the term "organicism" to describe the scientists, C.E. von Baer, C. Bernard, M. Bichat, W. His, and E. Pfluger, who did their work in the first two-thirds of the 19th century. In his treatise, *L' He're'dite'*, Delage (1903) first considered his preliminary concept of "Organicism" (D.J. Haraway, 1976, p. 2).

Later, a number of Organicism were established. Like vitalists, organicists also trace themselves to Aristotelianism, because like a spring, almost all modern biological ideas, directly or indirectly, are related to it. M. Beckner (1967) maintained that in the 20th century Organicism, as a new doctrine, was distinguished from the concepts of Vitalism (pp.549-551).

Thus, it can be said: Organicism is a theory holding, in contrast to Vitalism on the one hand, and mechanism on the other, that life and living processes are the manifestation of an activity possible only in virtue of the state of autonomous organization of the system rather than because of its individual components.

Although, Organicism is separated from Vitalism, according to Haraway, they still share some basic concepts and positions:

From a negative point of view, both maintain that the study of the parts does not suffice to explain the behavior of the whole. The methods and conclusions of other sciences,

in particular physics and chemistry, are held to be applicable to organisms but radically insufficient. Second, the form of the whole is important in embryological development, animal behavior, reproduction, and physiology. By whatever means, the properties of the whole are as essential in determining the nature and behavior of the parts at each stage in the life cycle as vice versa. Last, both organicists and vitalists stress the teleological behavior of organisms: there is at least the appearance of goal-directedness and design in biological phenomena. These properties ensure that biology is an autonomous science, not a postscript to physics (Haraway, 1976, p. 34).

The concept of regulation is also very important for both doctrines, which leads to the question of what are differences between these two doctrines. Haraway said:

Nevertheless, organicists and vitalists differ fundamentally on where they locate the root of wholeness and consequent regulative behavior of organisms. Vitalists of all hues assert some nonphysical entity -- either a nonquantifiable vital force like Driesch's *entelechy* or some basic difference between "vital substance" and ordinary matter. Organicists insist that wholeness, directedness, and regulation can be explained fully without such notions (*ibid*).

The real organismic paradigm, according to Haraway, consists of six " abstract elements of organicism -- form, symmetry, polarity, pattern, field and particles, " (op.cit.p.33) which will be discussed later in turn.

Vitalism was gradually replaced by Organicism, and during the first half of this century, several lineages of Organicism developed in different countries. According to Haraway:

At least three and perhaps four broad groups of organicists must then be distinguished. The German-speaking lineage included von Ehrenfels and Kohler (*Gestalt*), von Bertalanffy, and Paul Weiss. The English form two subgroups: Haldane, Russell, Morgan, and Smuts on the one hand and Woodger, Needham, and Waddington on the other. The Americans included Ritter, Henderson, and in a less philosophical, more experimental way, E.B. Wilson and R.G. Harrison. Mention should be given to a separate development among Marxists that came through Hegel, Engels, and Marx and flowered in Soviet biology of the 1920s and early 1930s (op.cit., p. 38).

II. Organismic Ideas of American and English Lineages

The major ideas of different lineages are now mentioned as follows, respectively.

1. The Organismic Ideas of American Lineage

1.1 The Ideas of W.E. Ritter

W.E. Ritter, an American zoologist, concentrated his efforts on contributions to the organismic perspective at the Scripps Institute in California during the first quarter of this century. According to Beckner (1967), Ritter was the first modern organicist because he introduced the term, "organismalism". Ritter's represented that "the organism in its totality is as essential to an explanation of its elements as its elements are to an explanation of the organism" (Ritter, 1919). "Ritter called nature a 'system' and thought it was important for a biologist to try to develop a general theory of natural knowledge in order to show the integrated character of the whole world -- animate and mental" (Haraway, p. 34).

Analyzing the development of the organismic conception, Ritter found that the concept of the pattern of G. Cuvier, the French comparative anatomist, dealt with organs as parts of the whole. Ritter thought that Cuvier's doctrine of organ correlations was useful to biologists in understanding reconstruction of whole from small fragments (ibid).

Although Ritter noted that Delage (1903) first called von Bear, Bernard, and Bichat "organisists", he did not consider Delage's term or these "organicists" as pioneers. Ritter thought the experiments of Roux and Driesch only as testing the powers of the elemental parts, and their results only as developmental mechanics, which failed to explain ontological development only by cellular phenomena (op.cit., p.35).

1.2 The Ideas of L.J. Henderson

L.J. Henderson was another American modern organicist. Although Becker did not list him as the first one, his organismic ideas were actually raised earlier than that of Ritter (Henderson, 1913, 1917). However, Henderson did not explicitly suggest the term either "organismalism" or "organicist". His two books, *Fitness of the Environment* (1913) and *Order of Nature* (1917), were later very important for the development of Needham's Organicism.

Henderson maintained that the conception of organization first appeared in the 19th century, as a development from the old ideas of function in physiology. Henderson, like Ritter, considered that Cuvier's doctrine of organ correlations explicitly included the concept of organization. However, unlike Ritter, Henderson thought of Roux's "developmental mechanics as a keystone in the experimental study of organization and regulation". Henderson also held that Organicism was differentiating itself from Aristotle's old Vitalism and his concept of internal teleology of organism (Haraway, pp.35-36).

According to Henderson, in the progress of the organismic approach, there were several independent lines: experimental morphology, physiology, and the study of metabolism. He concluded that "contemporary studies of organization only translated the Aristotelian idea of internal teleology into a concrete experimental focus on self-regulation" (op.cit., p. 36).

1.3 The Ideas of R. Harrison

R. Harrison was another important American organicist. His evolution towards Organicism was rooted in his connection to the American organicist and experimental embryologist E. B. Wilson. Both Wilson and Harrison were students of W.K. Brooks at

Johns Hopkins. However, Harrison's later concept of Organicism was related to that of Needham and Weiss (Haraway, p.36), which appeared as early as 1913.

Harrison mentioned the nature of morphological science as follows:

Organic form is the product of protoplasmic activity and must, therefore, find its explanation in the dynamics of living matter, but it is the mystery and beauty of organic form that sets the problem for us. Structure is the product of function, and yet at the same time, is the basis of function. The activity of an organism may be nothing more than continuance of those changes that produce development (Harrison, 1913, pp. 405-406).

Harrison maintained that organismic form must be dynamic and changed and cannot be static and fixed. "A statical organism can only be a dead organism ..., and dead organisms mean dead science (op.cit., p. 406). Thus, he defined form as the totality of a developing organism. According to Haraway:

The essence of his organicism is a new appreciation of interconnectedness of structure and function in developing animals. He pleads for an experimental approach to the problem of form, for a concretization of its principles. In his emphasis on experiment and analysis Harrison is in a different world from Goethe. The embryologist is essentially interested in the precise materials and process of development, not simply in the aesthetic perceptions that give his efforts meaning and motive. "Organic form must find its explanation in the dynamics of matter, and the distinction between living and non-living must fade." Aristotle would approve of Harrison; both know that the most peculiar quality of life is that "morphological quality of specific form with heterogeneity of material." The structure-function and part-whole relations, understood in a constant dialectic interplay, constitute the cornerstone of the developmental edifice (Haraway, p 44).

We can see that Harrison's organismic conceptions expressed dialectically. In biology, Harrison always dealt with problems, such as symmetry and asymmetry, the foundation of basic polarities, and the process of development of organ fields, in connection with aesthetics.

Although " Harrison did not write directly about aesthetic issues, his entire life's effort, in its content and its form, betrayed his adherence to dictate similar to the artist's" (Haraway, p.42).

A student of Harrison at Yale, Victor Twitty, wrote:

If I had to identify a single factor that made Harrison's work great, I would do it in terms of aesthetic considerations. He was constitutionally incapable of leaving a project until all its pieces had been fitted into a unitary whole whose composition met his artistic requirements (Twitty, 1966, pp. 9-10).

From this perspective the question arises: what is the pure form of aesthetics and what is the root of biological form and organization ? Harrison did not confront these questions. However, these issues are somewhat related to Zen thinking. some of Harrison's worlds are also close to Goethe's. We can see what Ritterbush said:

Goethe felt that vision was the primary sense, the door to understanding organic form. ... Many of the visual aspects of modern science --- charts, graphs, diagrams, spheres, and helices in molecular models, trees of life, fibers --- owe much to Goethe 's perception that " organisms could be reduced to schematic representations not just on the basis of comparisons one with another, but through the relations of their bodies of part to whole. (Ritterbush, 1968,p.6). Perception of part-whole unities was founded on a visual capacity (Haraway, p.41-42).

Thus, we see that Harrison's idea, like Goethe's, much emphasizes on the relations of part to whole.

2. The Organismic Ideas of English Lineage (1): the First Subgroup

Due to the differences of the conceptions between different English workers, two subgroups can be considered. The conceptions of the first subgroup relatively close to neo-Vitalism. The two major workers, J.S. Haldane and E.S. Russell, of this subgroup are presented below.

2.1 The Ideas of J.S. Haldane

J.S. Haldane was the first English organicist. The year 1917 seems a dramatic year for the doctrine of Organicism. The second book concerning the organismic idea, Haldane's *Organism and Environment*, based on the Silliman lectures at Yale, was published after Henderson's *Order of Nature*. Haldane insisted that neither Vitalism nor Mechanism was capable of explaining the nature of the coordination of physiological activities. He said:

It has been suggested to me that if a convenient label is needed for the doctrine upheld in these lectures the word "organicism" might be employed. The word was formerly used in connection with the somewhat similar teaching of such men as Bichat, von Baer, and Claude Bernard. Cf. G. Delage, *L'He're'dite'*, Paris, 1903, p. 435 (Haldane, 1917, p. 3).

Haldane should be judged as the first one to explicitly suggest the term "Organicism" and name himself deliberately as an organicist, although Beckner (1967) listed Ritter as the first because of his use of the term "Organismalism" in 1919. However, "Haldane made no effort to trace a specific lineage for his views, but spent his time arguing that understanding wholeness necessitated paying attention not only to parts of the organism in relation to total but also to the organism in relation to the environment" (Haraway, p.36).

Therefore, Haldane's idea of wholeness was not limited to the internal whole organic-body, but also including the external whole environment. This is a more complete concept of wholeness, although his view still only belonged to the pheno-world but not the noumo-world.

2.2 The Ideas of E.S. Russell

E.S. Russell, the second English organicist, sketched his biological position and opinions on intellectual ancestry entitled as "the Organismal Point of View". Russell, like all other organicists, differentiated his concept from both Vitalism and Mechanism. He insisted particularly that Driesch's view of entelechy was not helpful for the explanation of biological organization.

Russell traced his views of the organism, as a unified whole, in a line from Aristotle through Kant, Driesch, and finally to himself. He also traced his conception from a methodological viewpoint, called methodological Vitalism, through a type of psychobiology to the perspectives in his book of 1930. He considered the whole organism as the fundamental unit of biology.

Russell succinctly described the purposes of his conception of Organicism as follows:

It gives us a unitary biology, in which the abstractness and excessive analysis of the materialistic method are avoided; it allows us to look on the living thing as a functional unity, disregarding the separation of matter and mind, and to realize how all its activities --- activities of the whole, and activities of the parts, right down to the intra-cellular unities --- subserve in cooperation with one another the primary end of development, maintenance, and reproduction (Russell, 1930, p.189).

Because the conceptions of Haldane and Russell were relatively close to that of Driesch, Needham called the Organicism of this subgroup a different form of neo-Vitalism.

3. The Organismic Ideas of English Lineage (2): the Second Subgroup

The conceptions of the second English subgroup are relatively close to that of Mechanism. Two major workers, J. Needham and C.H. Waddington, are presented here only.

3.1 The Ideas of J. Needham

J. Needham, a biochemical embryologist and later a historian of Chinese science history, was a most important worker of Organicism. Due to the influence of the philosophical ideas of both Whitehead and Woodger, and later the influence of a dialectical Marxist philosophical perspective, Needham's ideas of Organicism were dialectic but also mechanistic. It is usually called non-vitalist Organicism, organic Mechanism (Materialism), or neo-Mechanism (Materialism).

Needham was influenced deeply by D'Arcy Thompson's mathematics, and his influences became a constant thread in Needham's later works. His conceptions were fully expressed in the following major papers and books: " The energy sources in ontogenesis " (1926), *Man a Machine* (1928), *The Sceptical Biologist* (1930), *Chemical Embryology* (1931), *The Great Amphibian* (1932), *A History of Embryology* (1934), *Order and Life* (1936), " Chemical aspects of morphogenetic fields " (1937), *Biochemistry and Morphogenesis* (1942), " Biochemical aspects of form and growth " (1951), and " Organizer phenomena after four decades: A retrospect " (1968).

According to Haraway (p.44):

If Aristotle was more congenial to Harrison, Plato dominates the soul of Needham. ... Needham is a complex fabric of Aristotelian and Platonic fibers. He notes that biochemistry has more affinities with Aristotle because of an intense consciousness of matter, which always had at least a minimum of form in its constitution from the four elements. And for the modern chemist, form permeates the whole of the science.

It is clear that the basic hierarchical idea within the organismic concepts must be included, as Haraway pointed out :

Connection between levels and development from one level of complexity to the next are the key foci of organicist biology. Again, form is conceived as the totality of structured relationships unfolded in development. Central to this conception are the dual categories of organization and energy, which are Needham's modern equivalents of Aristotelian form and matter (Haraway, p.45).

According to Haraway, Needham's major conception of form was wholeness. Do any single or particular forms exist in each hierarchical level, such as the form of atoms, molecules, genes, cells and cell organelles, tissues, organs, and individuals of certain species ? How can form or forms be folded and unfolded ? What kind of information directs and what kind of force prompts both the folded and the unfolded processes ? Neither Haraway and Needham explained or solved these basic and important problems.

Due to the importance of Needham's position in the field of Organicism, it is important to see how his conceptions developed. Needham was born just at the beginning of this century and educated as well as scientifically trained at Cambridge in 1920's. He was strongly indebted to F.G. Hopkins, the founder of biochemistry at Cambridge.

Needham took his task to try to build a bridge between biochemistry or molecules and morphogenesis or forms. He started his dissertation on the biochemistry of the development or ontogenesis of the Amphibian egg concerning inositol metabolism. He finished his dissertation in 1923 and this was the starting point of his later works (Needham, 1923). Needham's organismic conceptions and their development can be considered into three stages: from 1923 to 1933, from 1934 to 1945, and after 1945.

3.1.1 The First Stage

This stage began after his dissertation in further work at Cambridge. During this stage, Needham mainly worked on egg metabolism and the energy sources of ontogenesis. He showed how the Aristotelian concept of potentiality, *energeia*, was actualized in the modern concept of biochemical energy, associated with a special biochemical molecule, ATP (adenosine triphosphate). Here, Needham's concept of energy was an important basis of his later dual concepts of energy and organization. According to Haraway (p.45), it corresponded to Aristotle's conceptions of matter, one of the Aristotelian dual concepts of matter and form.

Concerning Needham's philosophical conceptions during this stage, he continued studying and analyzing of the history of Vitalism and Mechanism, as well as preparing and constructing his own neo-Mechanism. And there was a turning point at the early 1930's, as Haraway pointed out:

A critical turning point in his own thinking occurred in the early 1930's, a time that also saw the founding of the Theoretical Biology Club, a group extremely important to the articulation of the new paradigm. Beginning with his acquaintance with Joseph Woodger and the ensuing discussions at the Woodgery on theoretical biology, Needham developed his mature position on organicism (Haraway, p.102).

During this stage, although Needham's organismic conceptions had not yet been matured, he expressed himself actively. Within 10 years he wrote 4 very important books (1928, 1930, 1931, 1932), especially *Chemical Embryology*, a 3-volume creative work. In the introductory section of this book, he emphasized a version of science committed to the metaphor of Galileo: "To measure all things that can be measured, and to make measurable what cannot yet be measured."

Meanwhile, Needham agreed with T.H. Huxley's classical reductionist idea that the goal of biology was to reduce the facts of morphology to "the laws of the molecular forces of matter" (1931, p.9). These were the primary expressions of his mechanistic ideas and he further said:

It seems always to have two meanings, firstly, the Epicurean-Lucretian one which Huxley adopts here and Roux so brilliantly developed, in which shape is regarded as the outward and visible sign of properties of matter itself, and secondly, the Aristotelian one ... in which psychical factors are introduced as the essential elements in the ultimate analysis of shape (ibid).

Concerning the purpose and contents of Needham's this book, Haraway pointed out as follows:

The overall purpose was to lay the foundation for a chemical understanding of form; that is, to unite biochemistry and Entwicklungsmechanik, eventually seen as a task within an organismic paradigm. Its contents were elaborations of positions Needham had reached before he focused on the chemistry of the organizer; ... The text included ample sections on the unfertilized egg as a physicochemical system; growth; increase in complexity and organization; respiration and energetics; carbohydrate, lipid, and protein metabolism; enzymes, hormones, and vitamins; and immunology, as well as treatments of the biochemistry of egg, fetal membranes, and placenta (Haraway, p.110).

Thus we see that Needham has expressed his strict organismic perspectives since 1931.

3.1.2 The Second Stage

From 1934, Needham started to focus his attention on "morphogenetic hormones" or hormone-like molecules, by which he hoped to demonstrate the nature of "induction" or

"organizer" phenomena as discovered in H. Spemann's laboratory in Germany. Needham proposed that if Spemann's induction phenomena could be demonstrated as caused by biochemical molecules, such as hormone-like molecules, then he could successfully construct a bridge between biochemical molecules and morphogenetic forms. This is why he was so interested in and so caught up Spemann's experimental embryological works on induction phenomena.

It may be said that Needham was interested in Spemann's embryonic induction phenomena, in the same way that Driesch was interested in Roux's embryonic blastomeres and Wolff's lens regeneration phenomena.

Spemann called the particular dorsal lip area of the embryo the organization-center (Haraway, p.115), and Gilbert defined the organizer as:

The process by which one embryonic region interacts with a second region to cause the latter tissue to differentiate in a direction it otherwise would not is called *induction*. Because there are numerous inductions during embryonic development, this key interaction in which the dorsal mesoderm induces ectoderm to differentiate into neural structures is called *primary embryonic induction*. Therefore, Spemann referred to the dorsal lip cells as the *organizer* (Gilbert, 1988, p.299).

Although Spemann was not an organicist, he used the terms, organization and organizer, to describe his discovery. This just fitted Needham's conception. Therefore, Needham concluded:

The nature of the organizer influence was from the first recognized to set a problem the solution of which would profoundly affect our picture of the process of development. It meant nothing less than the discovery of the relational factor in development (1936, p.84).

Needham's conception of a simple biochemical solution for the organizer was enhanced by Spemann's further discovery in 1931 that material from the organization-center could still be induced after its cells were killed by crushing. Furthermore, Holtfreter, et al., next year in Berlin-Dahlem, showed that " the organizer influence was not abolished by boiling, thereby eliminating the action of an enzyme." Holtfreter also obtained " neural inductions in the newt using material from chick primitive streak while another work achieved similar results with human cancer cells" (Haraway, p.116).

Both Needham and Waddington were excited by the experimental results of Spemann and Holtfreter, and believed that all of these results favored their hypothesis of a simple chemical organizer. In 1934, Needham and Waddington made decisions to collaborate with Holtfreter in order to test their hypothesis.

In the same year, Needham, et al. (1934) reported their experimental results with the cell-free extract of the organizer region, which was spun out by centrifugation. It was very exciting that neural inductions were actually obtained. Needham believed such a result " strongly indicating that the organizer-hormone, for such it could now legitimately be called, was a fatty, lipoidal, or sterolic character, and so soluble in organic solvents." (Needham, 1936, p.86). After describing the experiments, Needham made a distinction of the organicist view of the organizer. According to Haraway:

To attribute all the effects of the organization center to a single chemical substance would have been a classical reductionist explanation. But the postulate of a morphogenetic hormone was integrated with field thinking, so that the resulting form of explanation was a model of Needham's goal of bridging chemistry and morphogenesis (Haraway, p.118).

According to Needham, et al., induction in the formation of a secondary embryonic axis was considered as the result of the interaction of three systems, namely, the graft, the overlying

host ectoderm, and the host organizer-center. The grafted tissue often influenced the regional character of the induction. The basis of this process seemed to indicate that there was a field nature involved in a series of complicated interactions. In this interaction process, the determination of an axis was called "evocation", whereas the determination of its regional characters was called "individuation".

In the ordinary induction, one of these determination, evocation, is always performed by the graft, while the other, individuation, is performed by the graft and the host working together, either in a cooperative or an antagonistic manner (Needham, Waddington, et al., 1934; Needham, 1934, pp.408-409).

Needham conceived that evocation was the result of a simple chemical stimulus, and called the suggestive morphogenetic hormone the "evocator". As to individuation, he felt that it could not be explained by dead organizers or organizer extracts, i.e. morphogenetic hormones. Therefore, in the paper of 1934, Needham only tried to identify the evocator but not to unravel the knot of individuation (Haraway, p.118). According to Haraway:

Focusing on the evocator, Needham judged that the experiments strongly hinted at a lipoidal, likely steroid, nature. Although only weak neural inductions had been produced with the ether extracts, a relatively sophisticated statistical treatment of data justified the opinion that the reactions obtained were significant and that the difficulty to be resolved in the future was technical--- better purification of the active substance. A large series of control experiments resulted in no neural inductions at all. Since it had been amply demonstrated that the evocator could be liberated from normally inactive tissue, the suggestion that the substance existed in a bound form was obvious. Only in cells ordinarily involved in inductions would active material be free (Haraway, p.119).

The suggestion that the evocator was sterol-like in nature was based mainly on three biochemical evidences: (1) the active material was ether soluble, (2) it was present in the

unsaponifiable fraction of the ether-soluble extract, and (3) it was precipitable with digitonin. In 1936 Needham, with a number of collaborators, published two papers: one was to further examine the activation of the evocator, and the other was to expand the evidence of its steroid character. According to the results of these further experiments, Needham believed: there was little doubt that this class of chemicals had vast biological significance. If a morphogenetic steroid hormone could be found, then his hypothesis would be proved (Haraway, p.120)

However, from 1936 to 1939, before events led Needham into China to do research on Chinese history of science, he could not justify his hypothesis on the evocator concerning the steroid as a morphogenetic hormone, even though he further published several papers and books. After World War II, because other workers on the organizer held considerably modified views, Needham did not continue his experimental work. " Induction is surely much more complicated than Needham felt in those years, but his theoretical point rests unperturbed." (Haraway, pp.47, 121-123).

The foundations of morphological form are to be sought in the proteins responsible for cell-structure, and ... these are inescapably connected with the normal metabolic processes of the living cell as a going concern (Needham, 1951, p.86).

Since Needham postulated his hypothesis concerning the steroid as a morphogenetic hormone for the evocator or inducer of embryonic induction in the early 1930's, more than a half-century has passed. What is the current status about this problem ? Because it is a very important problem, only a very brief summary is discussed here, and it will be discussed in later chapters. According to Gilbert (1988):

Although Spemann thought that searching for an organizer molecule was folly, his students pressed forward. They discovered that the identification of the active inducer was not going to be an easy task. The problem was a lack of specificity; it seemed that

a huge variety of things could induce a neural plate. These compounds included turpentine, formaldehyde, and methylene blue dye, as well as dead archenteron and an assortment of adult tissues from several phyla (p.308).

Therefore, Needham's " simple chemical hypothesis " of evocator was incorrect, and it was not as simple as Needham thought. Gilbert further said:

There is still debate as to the components and mechanism of primary embryonic induction, one of the oldest areas of developmental biology. One view, written in 1985 (Smith, et al.), acknowledges that ' it has to be admitted that we know virtually nothing about the biochemical basis of inductive interactions.' Surveying the field in 1927, Spemann remarked, What has been achieved is but the first step; we still stand in the presence of riddles, but not without hope of solving them. And riddles with the hope of solution---what more can a scientist desire ? The challenge still remains (ibid).

Thus, we can see that concerning searching for an inducer molecule Spemann held a different view from that of Needham. Spemann emphasized the riddles, not only about the components of the biochemical basis of inducer or evocator, but also the mechanism of primary embryonic induction, which remains a riddle. However, if one tries to use Eastern biophilosophical ideas to consider these riddles, it may be that they are actually not insoluble. A system based on Buddhist thought will be discussed in the Part III.

During the second stage, Needham wrote 6 books and more than 5 papers. The most important ones were 3 books: *Order and Life* (the Terry Lectures in 1935, published in 1936), *Integrative Levels: A Revaluation of the Idea of Progress* (1937a), *Biochemistry and Morphogenesis* (1942), and 1 paper " Chemical aspects of morphogenetic fields" (1937b). In these, Needham's conception of Organicism matured. In the book of 1936, Needham summarized his positions on form, organization, fields, particles (fibres and crystals) and hierarchical levels---the critical elements of organicism (Haraway, p.103). These positions can be further organized into the following three aspects:

The first is *the nature of biological order*. According to Needham, the central problem of biology was form and form meant a "time slice of a spatio-temporal entity," a phrase borrowed from Whitehead via Woodger. Needham rejected the argument of physicist Niels Bohr that the indeterminacy principle had anything to do with a "thanatological limitation of biological theory" (Needham, 1936, p.33).

Needham cited D'Arcy Thompson's theory of transformations as a stimulating example of exact analysis on the biological level. The issue of reductionism was simply irrelevant, but the ... notion of a dialectical level was helpful. Embryology, and thus the science of form, has to deal with the origin of the qualitatively new. Dialectical analysis was a rational method of approach to such transformation (Haraway, pp. 139-140).

The second is *the development of biological order*. Needham gave his definition of development as "a progressive restriction of potencies by determination of the parts to pursue fixed fates" (Needham, 1936, p.58). Haraway noted that Needham also used an analogy to explain his concept of development:

He used the analogy of a series of cones with a ball on the apex of the top cone in a very unstable balance. It could be stimulated to roll down the side and reach a second precarious balance, or metastable state. The hierarchy of cones, and of stimuli causing the system to reach new equilibrium positions, was considered analogous to the various grades of organizers in the normal course of development (Haraway, p.141).

The third is *the field and hierarchical continuity of biological order*. This aspect will be discussed in the next section.

Whitehead's organismic philosophy strongly influenced Needham, and Needham's dialectic and organismic conceptions obviously came from it. However, according to Abe's *Zen and Western Thought* (1989), Whitehead's philosophy of organism was strikingly close related to *Mahayana* Buddhism:

In my view, *Mahayana* Buddhism and Whitehead's philosophy of organism are strikingly similar because the latter minimizes duality and stands almost on the verge of overcoming duality (p. 168).

Whitehead's idea of the relatedness of actual entities is surely strikingly similar to the Buddhist idea of *pratitya-samutpada*, which may be translated as 'dependent co-ordination', 'relationality', 'conditioned co-production' or dependent co-arising'. Whitehead emphasizes the interdependence of actual entity (pp. 152-153).

Therefore, in this stage, although Needham had not yet touched Chinese history of science and Buddhism, he was indirectly influenced by the Buddhist dialectic and interdependent conceptions through Whitehead's philosophy of organism.

3.1.3 The Third Stage

During this stage, Needham mainly focused his efforts on the research and writing for the *Science and Civilisation in China* (1954-1988). However, in 1951 he contributed a paper to *Aspects of Form* (L.L. Whyte, ed.), in which he summed up his long-held beliefs about the nature of organic form---the organic Mechanism or non-vitalist Organicism. Needham expressed his efforts to bridge the "terrifying intellectual gap" "between the gross morphological forms manifested by living things and the specific molecular constructions which they possess." (1951, p.78). Whitehead was an important philosopher in relation to the formation of Needham's conceptions. Needham's emphasis in his organic Mechanism was on the primacy of organism over atoms. In his words:

The old controversies about the reducibility or irreducibility of biological facts to physical-chemical facts are now seen to be unnecessary if we realize that we have to deal with different levels of organization. The task of science is to elucidate the regularities which occur at each of these levels (ibid).

Here, Needham discussed the relationship between his organic Mechanism or Organicism and Reductionism, which will be mentioned later. According to Haraway:

Connection between levels and development from one level of complexity to the next are the key foci of organicist biology. Again, form is conceived as the totality of structured relationships unfolded in development. Contrast to this conception are the dual categories of organization and energy, which are Needham's modern equivalents of Aristotelian form and matter (Haraway, p.45).

Concerning the conceptions of organizer phenomena until to 1968, Needham still did not change his conviction substantially. Needham argued:

I still think that organization patterns and relations in living things, integrative hierarchies never exhibited in nonliving material collections, are the proper subject-matter of biological enquiry, and that the recognition of their existence is in no sense a disguised form of vitalism. I still think that biological order and organization are not just axiomatic either, but constitute a fundamental challenge to scientific explanation, and that meaning can only be brought into the natural world when we understand how successive "envelopes" or "integrative levels" are connected together, not "reducing" the coarser to the finer, the higher to the lower, nor resorting to unscientific quasiphilosophical concepts (Needham, 1968; Haraway, pp.138-139).

In 1969, Needham published his intellectual and significant book, *Science and Civilization in China*, Volume 2: *History of Scientific Thought*. In 1970, Needham organized a symposium on the history of biochemistry and published a book, *The Chemistry of Life: Eight Lectures on the History of Biochemistry*. The contents of these lectures covered the history of the biochemistry of photosynthesis, vitamins, animal hormones, enzymes and biological oxidations, and some biochemical signposts in the progress of neurology. All of these lectures were concerned with biochemical reactions and the organic molecular basis of life. However, Needham, at the beginning of this book, gave a very long introduction, in

which he talked broadly concerning both Eastern and Western biophilosophical conceptions.

Although Needham's concept was neo-Mechanistic or neo-Materialistic, he was also interested in both Aristotle's idea of *pneuma* and the Chinese Taoist idea of *ch'i* (Chi or Qi). Needham compared them and said:

How many books could be written (and of course have been written) on the ' breath of life ' ! ... This pneumatic proto-physiology and proto-biochemistry was common to all the civilizations of the Old World. For it has been shown in detail that the *Pneuma* of the Greeks was equivalent to the *prana* of India, the *ch'i* of the Chinese and later on the *ruh* of the Arabs. ... Ancient Chinese ideas were much more like those of the Greeks than has usually been supposed, for about at the same time as Aristotle, Hsun Ch'ing and others conceived a ' ladder of soul ', e.g. *ch'i*, *sheng*, *chih* and *i*, representing a very similar ascent (1970, pp.ix-x).

Needham used his neo-Materialistic or Organicistic views to explain the Aristotelian soul and the Chinese *ch'i*. He emphasized that " the 'souls' were but names for particular functions of the levels of living, ..." Needham further said:

In China also, *ch'i* become more and more material as time went on, and having begun (as we know from the etymology of its ideograph) as the steam arising from cooking rice, it came to mean by the twelfth century all kinds of matter, however gross. This was the time at which the Chinese scholastics, the Neo-Confucians, were able to build their scientific world-view on two conceptions only, *ch'i*, which we might now call matter-energy, and *li*, which we may call organic pattern at all levels, wherever manifested (1970, p. xi).

According to Needham, John-Baptist van Helmont (1579-1644), the father and founder of all modern biochemistry, separated clearly the Aristotelian *pneuma* idea into his *gas* and *blas*. Needham gave Helmont's ideas prominent consideration:

From his recognition of the identity of carbon dioxide onwards, the way led clear ... to the modern discoveries of the transit and carriage of gases in living bodies, the

respiration of the cells themselves, and the nature of the energy-providing oxidation-reduction reactions going on inside them. Van Helmont's *blas* was another way of talking about the more spiritual spirits, including those *archaei* which both Paracelsians and Chinese had visualized as presiding over the activities of every organ (1970, pp. x-xi).

It is clear that Needham has already started to compare Western biophilosophies with Eastern ones and to make some connections between them. However, he only did these with Chinese original philosophies, Taoism and Confucianism, and mainly around their ideas of Chi but he did not yet do this with Buddhism.

In sum, Needham's biophilosophical conceptions basically belong to neo-Mechanism or neo-Materialism, however, he only was " an acceptance of strict mechanism in sciences" and held a view of " mechanism to science and teleology to philosophy." According to Haraway:

The essence of his position was an acceptance of strict mechanism in science, but a rigid exclusion of a metaphysical materialism. His compromise was to oppose method to metaphysics and insist upon the relevance of mechanism to science and teleology to philosophy (Haraway, 112).

Therefore, Needham's biophilosophical view is not a strict neo-Mechanism or neo-Materialism. It may be said that Needham is somewhat a "neo-dualist". We can see what Haraway has said:

The fundamental tenet of his neo-mechanism was the belief that physico-chemical explanation must be extended to cover all natural phenomena. The mechanistic program alone had resulted in progress in scientific knowledge; vitalism had always been obscurantist. Nonetheless, there was an important truth in vitalism: concern for the element of consciousness, the inner lining of the world. Thus Needham found himself forced to accept a radical dualism. ... He reject any split between organic and inorganic but preserved the division between mind and body. He did not envision mind and body as ultimate categories but as aspects of reality that must not confused (ibid, p.127).

It may be also said that Needham's idea is a modern "neo-Cartesianism." Although he was very interested in Chinese biophilosophies, he might be limited to understand or even misunderstand them by his neo-cartesian biophilosophical ideas.

3.2 The Ideas of C.H. Waddington

C.H. Waddington, another English Organicist, was also a well-known embryologist and geneticist. He worked with Needham on the investigations of the biochemical basis of morphogenesis and the activation of evocator through out the 1930's. Their basic organismic ideas, namely organization, hierarchy, totality, regulation, and field, were closely co-related.

It is interesting to note that Waddington and Needham, as well as Weiss, all came to biology from other areas: Waddington from geology, Needham from biochemistry, and Weiss from engineering. Waddington's organismic concept emphasizes his special notions of biological field, introduced in the next section.

4. The Organismic Ideas of German Lineage

In German lineage, the most important organicists are Ludwig von Bertalanffy and Paul Weiss.

4.1 The Organismic Ideas of L.von Bertalanffy

L.von Bertalanffy was one of the earliest organicists, and was "probably the first to develop the new standpoint in a scientifically and logically consistent form", he called "organismic conception". According to Bertalanffy (1952/1960):

Biological research and thought have hitherto been determined by three leading ideas, which may be called the *analytical and summative*, the *machine-theoretical*, and the *reaction-theoretical conceptions* (p.9).

Analysis of the individual parts and processes in living things is *necessary*, and is the prerequisite for all deeper understanding. Taken alone, however, analysis is not *sufficient* (p.11).

Bertalanffy's organismic conception deals with that: "Every organism represents a system, ... a complex of elements in mutual interaction" (ibid). He thinks that there are limitations of the analytical and summative conceptions:

First, it is impossible to resolve the phenomena of life completely into elementary units; for each individual part and each individual event depends not only on conditions within itself, but also to a greater or lesser extent on the conditions within the *whole*, or within superordinate units of which it is a part. Thus, the characteristics of life are characteristics of a system arising from, and associated with, the organization of materials and processes. Thus, they are altered with alterations in the *whole*, and disappear when it is destroyed.

Secondly, the actual whole shows properties that are absent from its isolated part. The problem of life is that of *organization* (op. cit. p.12).

Thus the problem of wholeness and organization sets a limit to the analytical and summative description and explanation (op. cit. p.14).

From Bertalanffy's basic ideas of system, wholeness, and organization, another induced idea is order, level or hierarchy. According to Bertalanffy:

The task of biology, therefore, is to establish the laws governing order and organization within the living. Moreover, as we shall see presently, these laws are to be investigated at all levels of biological organization---at the physico-chemical level, at the level of the cell and of the multicellular organization, and finally at the level of communities consisting of many individual organisms (op. cit. p.15).

Bertalanffy's organismic conception can be summarized as the following leading principles:

The conception of the system as a whole as opposed to the analytical and summative points of view; the dynamic conception as opposed to the static and machine-theoretical conceptions; the consideration of the organism as a primary activity as opposed to the conception of its primary reactivity (op. cit. pp.18-19).

According to Bertalanffy, an organismic conception can overcome the antagonism of the mechanistic and vitalistic conceptions:

These principles enable us to overcome the antagonism of the mechanistic and vitalistic conceptions. Both are based on the analytical, summative, and machine-theoretical principles. The mechanistic theory did not approach just the fundamental problems of life---order, organization, wholeness, and self-regulation. ... Vitalism starts with these unsolved problems. But it does not overthrow the summative and machine-theoretical conceptions. On the contrary, vitalism views a living organism a sum of parts and machine-like structures, assuming them to be controlled and supplemented by a soul-like engineer. ... The mechanistic view breaks down in face of the phenomenon of regulation and of the origin of the "machine"; vitalism renounces scientific explanation. Opposed to both, stands an organismic conception. (op. cit. p.19).

4.2 The Organismic Ideas of P. Weiss

Paul Weiss, another important organicist in German lineage, was originally trained as engineer, and later transferred into the field of biology, major in embryology and biophilosophy. Haraway (1976, p.55) introduced him as follows:

Weiss, having been trained as an engineer, brought into biology the early thinking on systems. Well grounded in the physical sciences, he brought to biology intellectual frameworks derived from the late nineteenth and early twentieth century study of electromagnetic fields and light-wave propagation.

Because Weiss mainly gave his important contribution on the conception of organic fields, his ideas will be introduced in the next sect.

III. Biological Field and Dialectic / Hierarchical Organization

1. The Concept of Biological Field

1.1 The Precursory Concept of the Biological Field

The origin of the concept of biological field was introduced from the physical ideas of gravitation and electromagnetic fields. However, before the appearance of these events, there were already of some precursory concepts in the field of embryology, the concepts of polarity, symmetry, gradients, and regeneration.

Theodor Boveri (1862-1915) was one of the earliest biologists to call attention to the importance of polarity, symmetry, and gradients in animal (e.g. sea urchin) embryological development. He developed “the idea of a privileged region of dominance as a cause factor in development. ... Boveri introduced the term *Gefälle*, or gradient, into modern biology” (Bertalanffy, 1952, p.53). Spemann (1938, p.318) called Boveri’s this concept the “general gradient theory”, and its essence is that:

The body of many, if not all animals, at least in the embryonic state, possesses one or several axes with unequal poles along which there exists a gradient of some sort. The course of development depends on these gradients to a high degree.

After Boveri, the work of C.M. Child made the gradient theory into full prominence. Child’s concept of gradient is based on metabolic rate and other phenomena of morphogenesis. According to Haraway (p.53):

Child believed there was, as a general phenomena in development, a primary center of activity determining a quantitative metabolic gradient. New centers of activity could arise as a result of physiological isolation. The focal idea was that morphological structures derived from physiological *processes*. With his emphasis on activity and process, Child opposed the idea that intimate protoplasmic structure was the primary determinate of pattern (Spemann, 1938, p.325; Child, 1941, chap. 8).

Haraway thought that “The single most important organizing principle developed in this century to treat pattern was that of *field*.”

On the series research bases of Boveri, Child, and Harrison on the phenomena of polarity, symmetry, and gradients of egg development and limb regeneration, it may be said that there were two origins directly and indirectly to introduce the concept of *field* into the field of developmental biology and biophilosophy in the development of the concept of *organic field*.

The first origination was directly from the physical concept of electromagnetic field. A. Gurwitsch (1922) firstly used this term in biology. A few years later, P. Weiss (1926), from his position of physical engineer, directly introduced the concept of electromagnetic field to explain the results of his and others’ work on limb regeneration in amphibians. J.S. Huxley and G.R. De Beer (1934) further generalized Child’s gradient idea into the concept of *gradient fields* (Haraway, p.54-55).

The second origination was indirectly from Gestalt psychology, especially from two Gestalt psychologists’ work. W. Kohler (1947) developed field concept, which was also originated from the notion of physical field, in opposition to the classic associationist theories of perception. They stressed the conceptions of wholeness and regulation, which were “two perennial stumbling blocks” for the investigation of developmental biology (Haraway, p.55).

1.2 The Concepts of Biological Field of A. Gurwitsch and P. Weiss

The concept of biological field of A. Gurwitsch (1927) is emphasized on geometrical property and constituted stimulus rather than that of P. Weiss (1926, 1939, 1950, 1968) on field of force. Haraway (p.58) described as follows:

The strong geometrical orientation dematerialized Gurwitsch's fields much more than Harrison, Needham, or Weiss would permit. Gurwitsch's fields grounding in biochemistry less from an analogy to radical physical concepts than from his Platonic trust in geometry. His solution to the form problem was mathematical, not physical or biological.

However, P. Weiss' concept of field is in some extent different from that of Gurwitsch, and is mainly from that of physical electromagnetic field. According to Haraway (ibid):

Paul Weiss objected to the ideal fields of Gurwitsch, which were based not on the immense structural complexity of the organism but on ideal geometric constructions. ... Weiss conceived of a field as a system of organizing factors that proceed from already organized parts to other regions and that result in formation of typical patterns. Fields break up during development, producing a number of subfields that direct development of organs within the organism. ... In sum, a field was the complex of "factors which *cause the originally indefinite course of the individual parts of a germ to become definite and specific*, and, furthermore, cause this to occur *in compliance with a typical pattern*" (Weiss, 1939, p.290).

1.3 The Concept of Biological Field of J. Needham

Driesch borrowed from Aristotle the term "entelechy" or intensive manifoldness to account for the phenomena of regulation. However, Needham rejected to use the term

entelechy, and thought the principle of regulation to be entirely immanent. Another theory of gradients was proposed to account for "intensive manifoldness above the atomic level."

According to Needham, gradients were a particular expression of the more general categories of field theory. As to field theory, it was considerably beyond the dead-end arguments of epigenesis and preformation.

Haraway (p.58) stated Needham's concept of biological field as:

Needham believed that the biochemical basis of pattern was paracrystalline protein patterns, the postulated material basis of biological fields. The properties of such a system could account for maintenance of pattern when mass is reduced, perpetuation of pattern when mass is increased, fusion of patterns when orientation is favorable, the heteropolar and heteroaxial nature of patterned systems, and finally observed wholeness rather than mosaicism (ibid).

In the paper of 1937b, Needham mentioned that fields were distinguished from simple geographic regions of the embryo by three criteria: any given point within the force field had to possess a given quality, a given direction, and a given intensity. Fields were judged in terms of instability and successive equilibrium positions. Behavior of cells could be thought of as a function of position, within certain boundaries, within the whole. Many of organizational forces in fields were "to some extent on a suprachemical level." (Needham, 1937, p.71; Haraway, p.124).

The concept of field was one of Needham's important notions. By the aid of this concept, he hoped to hierarchically and dynamically establish his organization system on a four dimensional basis. According to Haraway (pp.124-125):

Needham hoped that his work on the evocator, coupled with a sophisticated understanding of proteins and paracrystalline structures, would give a firm biochemical content to morphogenetic field. One goal is to account for the multiplicity of biological

fields in contrast to the relatively few kinds of physical fields. In sum, Needham saw field law as a dynamic description of the establishment of order and form during development. He was convinced that fields were an advance over static anatomical description in embryology. Fields provided a rich source of images for the experimental task of concretization.

Whitehead's *Science and Modern World* strongly influenced Needham's conception of Organicism. The primary contribution of Whitehead was the criticism of Needham's notion of simple location. The concepts of field seemed essentially adequate to biological theories. Explanations in the terms of fields dealt with wholes and position effects. The formulations of Whitehead supported organismic approaches to biology from the concepts of gestalt to the use of topographical analysis. We can look at what Needham said (1943, p.197):

According to Whitehead, all things in the world are to be conceived as modifications of conditions within time-space, extending throughout its whole range, but having a central focal region. ... In topographic analogy ... the influence of the thing grades off past successive contours ... in every direction. The connection of this idea with the sort of fact we are always meeting in biology, namely phenomena of field character, is obvious, and today the concept of field is equally widespread and necessary in biology as in physics.

1.4 The Concept of Biological Field of C.H. Waddington

C.H. Waddington (1934, 1956, 1966) further developed the Concept of Biological Fields. His conception is somewhat different from others', and mainly emphasizes the canalization of a developmental *chreod*. According to Haraway (p.59):

During the 1930's Waddington introduced the idea of the individuation field to describe a field associated with the formation of a definite organ with characteristic individual shape. ... He drew the analogy between his individuation field and the behavior of magnetic or other physical fields.

Waddington described his conceptions as follows:

For instance, if a field is cut in two each half may reconstitute a complete field, so that two whole organs are developed. These are often mirror images of one another. On the other hand, if two fields are brought together and allowed to fuse, they may rearrange themselves into a single field. Again, if a part of a field, either central or peripheral, is removed, the remainder may compensate for the defect and become complete again, while the isolated part can often become modified into a small but complete field (Waddington, 1956, pp. 27-28).

Waddington distinguished his biological field or embryological field or developmental field with two kinds of physical fields, the gravitational field and the electromagnetic field. He always argued that field theory possessed a special meaning in biology.

According to Haraway (p. 60):

There is only one type of gravitational field and one sort of electromagnetic field, but there are almost as many potential biological fields as there are organs and species. ... An embryological field is more complex than electromagnetic or gravitational fields in two ways: time can never be left out of the picture and the material substratum is immensely more complicated."

Waddington mentioned that the field concept required reference to a "multidimensional space", " which would have axes on which one could plot not only position in time and the three dimensions of space but also concentrations of essential chemical compounds" (Waddington, 1966, p. 109).

Waddington's basic concept of field was established on the basis of another idea of a "chreod", a directed path, or a trajectory of normal development. This concept was introduced to deal with the causal complexity of fields and to stress their regulative character. Waddington proposed that the chreod exists as an "attractor surface" which can bring back displaced points into certain place. If a point escapes from the attractor surface, a new situation appears in which regulation is disturbed and a varied state is to be occurred (Haraway, p.60).

What are the concepts of a chreod and an attractor surface ? Waddington defined them as follows:

Any such regulative properties can be expressed by specifying some "normal" developmental pathway within a multidimensional space and describing the manner in which it acts as an attractor for neighboring pathways. A region of phase space characterized by an attractor time trajectory has been called a chreod. A developmental field is essentially a chreod, whereas electromagnetic and stationary gravitational fields are not (1966, p.123).

According to Waddington, the strength of the canalization of a developmental chreod can be tested by experimental approaches: genetical breeding, transplantation, fusion of parts, and defect experiments. The concept of canalization refers to the degree of regulation (Haraway, p.60).

This author was very interested in Waddington's concepts of acquired characters through developmental canalization and genetic assimilation, so that these concepts were tested by the genetical breeding approach in *Drosophila* at the end of 1950's and the beginning of 1960's. According to the experimental results obtained, considerations were made that the mechanism of developmental canalization and genetic assimilation is actually the concentration of multiple genes by continuous selection under relatively fixed conditions. Thus, it was suggested that the concept of multiple genes must be added to Waddington's system (Cai,1960, 1962a, 1962b).

Therefore, it is suggested that Waddington's concept of multidimensional space needs to include the idea of multiple genes. Thus, Waddington's multidimensional space would have axes on which one could plot not only position in time, the three dimensions of space, and the concentrations of essential chemical compounds, but also the hierarchy of organization from the molecular level to the whole organism level.

2. The Concept of Dialectic / Hierarchical Organization

It may be said that the concept of dialectic / hierarchical organization is the basic view of Organicism. This concept is mainly represented by Bertalanffy (1952/1960), Needham (1936, 1937a, 1942, 1943) and Weiss (1955, 1969). Here is only briefly described that of Bertalanffy and Needham, as follows.

2.1 The Concept of Hierarchical Organization of L.von Bertalanffy

L.von Bertalanffy (1952, p.172) considered science as a *hierarchy of statistics*.

All laws of nature are of a statistical nature. They are statements about the average behavior of collectives. Science as a whole appears as a hierarchy of statistics.

At the first level is the statistics of microphysics. In the realm of elementary physical events, a deterministic treatment is impossible in principle. As was said above, microphysical events also intervene in certain biological phenomena.

A second level is constituted by the laws of macrophysics, that is, of those phenomena where a real number of elementary physical units is concerned. These laws are also essentially statistical.

A still higher level is represented by the biological realm.

Finally, there are the laws that apply to supra-individual units of life. ...

Thus on the different biological levels law can be established that are exact and quantitative and constitute a hypothetico-deductive system. ...

In this hierarchy of statistics we find a remarkable phenomenon which we can describe as an increase in degree of freedom.

Bertalanffy's hierarchical notion is an important constitution of his organismic conception.

2.2 The Concept of Dialectic / Hierarchical Organization of J.Needham

In the book of 1942, Needham also made some statements on his speculative contribution to biology, as he repeated large sections of the argument of the Terry Lectures extending coverage of this idea. Needham expanded on the crystallography of proteins, the crystal structure of animal fibers, and the ubiquitous presence of fibers on various levels of biological organization. He also emphasized his new work on anomalous viscosity of protein solutions to the significance of fibers in field systems.

This plastic conception of protein molecular arrangement led to Needham's assertion that living systems were liquid crystals, a statement which paralleled that of Harrison. Needham also noted that workers were too early to abandon searching for logical consistency and think the induction phenomena as nonspecific. He believed that there existed a hierarchy of inductors, chemically identifiable, operating in normal development. Needham vindicated his claim that if workers could study carefully over time, they should not fail to find this (Haraway, p.144).

In the book of 1943 (p.15), Needham considered nature as a series of dialectical and hierarchical syntheses:

From ultimate physical particle to atom, from atom to molecule, from molecule to colloidal aggregate, from aggregate to living cell, from living cell to organ, from organ to body, from animal body to social association, the series of organizational levels is complete. Nothing but energy (as we now call matter and motion) and the levels of organization (or the stabilized dialectical syntheses) at different levels have been required for the building of our world.

Therefore, Needham's dialectic concept was connected with his concept of hierarchical organization.

Chapter 13 Theory of Reductionism

I. Introduction

I. Background

We have mentioned the theories of Vitalism and Organicism above. Because the basic idea of Vitalism, the soul or psyche, or vital force, or vital energy, or entelechy, or the like, could not be proven experimentally and directly, many biophilosophers started to develop another theory, called Organicism. However, Organicism is actually an intermediate between Vitalism and Mechanism. Therefore, as we have described before, there were two subgroups of Organicists in English lineage. One inclined to Vitalism, like J.S. Haldane and E.S. Russell, and the other inclined to Mechanism, like J. Needham and C.H. Waddington.

As early as in 1931, Needham in *Biochemistry and Embryology* already "agreed with T.H. Huxley's words that the goal of biology was to deduce the facts of morphology from 'the laws of molecular forces of matter'." (Needham, 1931, p.9; Haraway, 1976, p.111). This is what Needham hoped to bridge the molecular and atomic level with the morphological level. Therefore, Needham's neo-Mechanism already included the seeds of Reductionism.

It may be said that the date of April 25, 1953, issue of *Nature* in which Watson and Crick's "Molecular Structure of Nucleic Acids" appeared, is the birthday of modern biological Reductionism. Since then, the reductionist concept stimulated the development of both molecular genetics and molecular biology. In a very short time, this concept almost influenced all areas of biology. Many biologists believed that this is a very big advancement in biology and even in whole natural science; as A.Rosenberg said:

Since Galileo the natural sciences have encompassed more and more phenomena; their theories have become deeper and more accurate in description and prediction; these theories have been bound together more and more closely; and their technological applications have enabled us to control more and more of our environment. The sequence of theories in physics, in chemistry, and now in biology, has in this view been a succession of increasingly close approximations to the truth about the universe (Rosenberg, 1985, p.69).

However, there also exist some antireductionist views which will be mentioned later.

2. Definition

What is Reductionism ? It may be defined simply as: Reductionism is a theory of reducing complex data or phenomena to simple terms. Concerning the concept of reduction, however, there are several different views. According to D.L. Hull:

Three senses of reduction can be distinguished with some clarity---epistemological reduction, physical reduction, and theoretical reduction. Epistemological reduction concerns the proper relation between scientific theories and the objects of our knowledge. Physical reduction concerns the relations between the fundamental entities postulated by various scientific theories. And theoretical reduction concerns the relations between the scientific theories themselves (Hull, 1974, p.3).

However, according to F.J. Ayala (1974), Reductionism was somewhat distinguished into three other ways: ontological, methodological, and epistemological. The ontological view of reduction is " whether physicochemical entities and processes underlie all living phenomena". The methodological view of reduction is " concerning the strategy of research or the acquisition of knowledge" in the study of life phenomena. As to the epistemological view of reduction is " whether the theories and experimental laws formulated in one field of science can be shown to be special cases of theories and laws formulated in some other branch of science".

Comparing these two threefold divisions of reduction concepts, the physical one of the former relates to the ontological one of the latter, and the theoretical one of the former relates to the epistemological one of the latter. As to the methodological one of the latter seems terminologically different from the former, however, it still somewhat relates to the epistemological one of the former. Comparison of these two divisions is shown in Table 24.

Table 24 Comparison of Two Threefold Divisions of Reduction Concepts

Hull's Division	Ayala's Division
Physical Reduction	Ontological Reduction
Theoretical Reduction	Epistemological Reduction
Epistemological Reduction	Methodological Reduction

M.Ruse (1973, 1988) mentioned another threefold division of reduction views. However, it was still not totally new: two of them, the ontological and the methodological, were same as that of Ayala, and one of them, the theoretical, was same as that of Hull.

By integration of the above several threefold divisions and on the basis of that of Ayala's, we can suggest a threefold classification of reductionism as ontological including physical, methodological, and epistemological including theoretical. They are briefly described as follows.

II. Ontological and Methodological Reductionism

I. Ontological Reductionism

Ontological Reductionism means that physicochemical processes underlie all living things and entities. It claims that "the laws of physics and chemistry fully apply to all biological processes at the level of atoms and molecules" (Ayala, 1974, p. viii).

According to Ruse (1988, p.24):

This is the claim that bigger entities are composed of no more than smaller entities. The whole is composed of nothing but its parts. One does not have the parts plus some mysterious new substance. ... An organism is nothing but the molecules of which it is made. There is not some life force or suchlike thing which is needed to make a living being. In this sense---and, as far as ontological reductionism is concerned, in this sense only---humans are like machines.

All Reductionists reject Vitalism. As Th. Dobzhansky (1974) said: "most biologists are reductionists, ontologically, since they see life as a highly complex, highly special and highly improbable pattern of physical and chemical processes." And according to Ayala:

Vitalism is now practically a dead issue in the philosophy of biology, particularly because of its sterility as a guide in biological research. A nonmaterial principle cannot be subject to scientific observation, nor lead to genuinely testable scientific hypothesis (Ayala, 1974, p. viii).

However, when we come to human beings, there are a little more problematic questions of Ontological Reductionism to be found (Caplan, 1987, 1988; Ruse, 1988, p. 24). Why "most biologists are reductionists" as Dobzhansky said, and why "Vitalism is now practically a dead issue in the philosophy of biology" as Ayala said? This is partly due to the weakness of Vitalism itself and partly due to the misunderstanding of some biologists.

2. Methodological Reductionism

Methodological Reductionism claims that the strategy of research or the acquisition of knowledge in the study of life phenomena should always seek explanations at the lower levels and ultimately at the level of atoms and molecules (Ayala, 1974, p.24). In other words, the claim is also that "all other things being equal, one ought to explain in terms of the smaller rather than the larger." For example, "explain sex in terms of the chromosomes, if you must, but, even better, explain in terms of DNA molecule (Ruse, 1988, p. 25; Williams, 1985).

According to Ruse:

Methodological reductionism is significantly more philosophically contentious than ontological reductionism. I take it that no one would deny that a major trend---probably *the* major trend---in science has been toward the explanation of the large in terms of the smaller. Moreover, even before the coming of molecular biology, methodological reductionism of this kind was being practiced highly successfully in biology (Ruse, *ibid*).

Actually, there is a lot of controversy concerning this type of Reductionism. Different fields of biologists hold different attitudes. According to Ayala:

Consider the study of heredity. An extreme antireductionist might claim that knowledge of the molecular structure of DNA and of the molecular mechanisms of its replication, transcription and translation is of little biological interest. On the other hand, an extreme reductionist might argue that Mendelian genetics had no scientific import until the underlying molecular processes became known (Ayala, 1974, p.ix).

According to Ruse (1988), "think of the importance of the classical concept of the gene. This is not to deny ---what is often pointed out---that there is usually much more to explanation than merely the positing of tiny entities (also Campbell, 1974; Mayr, 1985a, 1985b).

Ruse (1988, p. 26) further argued (also see: Doolittle, 1985; Hunkapiller, et al., 1982; Jungck, 1983; Robinson, 1986; Wimsatt, 1976, 1979, 1980):

To push all the way to the DNA molecule is only to take to the limit what one has already accepted as a good way of doing science. The objections rise when one argues, in the first place, that reduction and the genes, of whatever order, offer the best path for the biologist. Molecular biology simply intensifies these worries.

This may be, however, agreed by most of biologists, if not all of them, that "the study of problems at a given level of complexity of the living world must proceed by exploring lower as well as higher levels of organization" (Ayala, 1974, p.ix).

III. Epistemological or Theory Reductionism

According to Ayala, the general meaning of Epistemological or Theoretical Reductionism and the conditions for this kind of reduction are as follows:

Scientific theories have sometimes been shown to be interconnected by establishing that the principles of a theory or branch of science can be explained by the principles of another theory or branch of science of greater generality. The less general theory, called the secondary theory, is then said to have been reduced to the more general or primary theory. The integration of diverse scientific theories into more comprehensive ones simplifies science and expands the explanation power of scientific principles (Ayala, 1985, p.65).

Nagel (1961; see also Ayala, 1968) has formulated the two conditions that are necessary and, jointly, sufficient to effect the reduction of one theory or branch of science to another. These are the condition of derivability and the condition of connectability (ibid, p. 77).

However, before starting to discuss this type of Reductionism, however, we have to first distinguish between the ideas of reduction and replacement. It is well-known that the evolution of science does not run smoothly. Sometimes changes take place dramatically, and at other times, changes occur gradually. Thomas Kuhn (1979) termed the former as revolutionary science and the latter as normal science.

According to Hull (1974, p.8):

Usually in a scientific revolution, one widely accepted scientific theory is replaced by another. Such changes were accentuated in the early years of science by the replacement of partially supernatural theories like special creation with fully naturalistic theories like Darwin's theory of evolution. During periods of normal science, the changes that take place tend to be less radical. Scientists strive to make their theories as comprehensive as possible, sometimes by annexing another, less comprehensive theory.

According to this distinction, one can not deal with every theoretical change as reduction during the evolutionary processes of sciences. One can deal with following examples as theoretical replacement: Newtonian physics to replace Aristotelian physics, Lavoisier's oxidation theory to replace the phlogiston theory, Darwinian evolutionary theory to replace special creationist doctrines, and Mendelian particle inheritance theory to replace Galton's blending-blood inheritance theory. Concerning the examples of reduction, Hull further mentioned:

In the past such "reductions" have always occurred within the confines of a single, traditionally defined area of science. During the past two decades, however, something that looks very much like reduction has taken place in genetics, but this time the theories belong to two different scientific domains. Biologists seem to be in the process of reducing Mendelian genetics, a biological theory, to molecular genetics, a theory couched in physico-chemical terms (ibid, pp.8-9).

In a certain kind of sense, it may be said that reduction of theories is the integration of scientific theories into a more comprehensive theory to simplify science and extend its explanatory power. According to such kind of view, Ayala mentioned (1974, p.x):

In biology, the binary character of reproduction at the cellular level, the relative constancy of the hereditary information through the generations, the mechanism of transmission of hereditary information from the nucleus to the cytoplasm, and other elements of the theory of inheritance, have been reduced to chemistry after the discovery of the structure and behavior of certain molecules such as DNA, RNA and some enzymes.

Ayala also mentioned some examples of theoretical reduction other than in biology as follows:

Reduction of a whole branch of science to another has repeatedly been claimed in the history of science. During the last hundred years, several branches of physics and astronomy have been to a considerable extent unified by their reduction to a few theories of great generality, such as quantum mechanics and relativity. The reduction of thermodynamics to statistical mechanics was made possible by the discovery that the temperature of a gas reflects the mean kinetic energy of its molecules. A large sector of chemistry has been reduced to physics after it was discovered that the valence of an element bears a simple relation to the number of electrons in the outer orbit of the atom (ibid).

According to Hull, there exist two different kinds of theoretical reduction: the homogeneous and the heterogeneous. The former is defined in that the theories involved refer to roughly the same types of things and contain the same terms, such as "the subsumption of Kepler's laws of planetary motion and Galileo's law of free fall under Newtonian mechanics and the law of universal gravitation." The latter is defined with theories involved refer to apparently different kinds of phenomena and contain different descriptive terms, such as "that of thermodynamics to statistical mechanics." (Hull, 1974, p.9). According to Ruse:

Although it is probably methodological reductionism which has most engaged scientists recently, it is theory reductionism which has spilt most philosophical ink---and, from a broader perspective, it brings us back to the ultimate aims of science, most particularly of biology. This kind of reductionism centers on the connections between theories, usually between an older theory and a newer rival (Darden and Maull, 1977; Maull, 1977; Ruse, 1988, p.26).

Just as we have pointed out above that theoretical reduction is not replacement, Ruse further emphasized:

At the general level, one can see why evolutionists now start discussion with the DNA so forth, is not thrown overboard, but is rather given a deeper backing through our new knowledge of the molecular basis of life (ibid, p.21).

After Watson and Crick (1953) published their paper, "Molecular structure of nucleic acids", Nagel (1961) published his book, *The Structure of Science*, and applied the idea of reduction to the field of biological philosophy. Since then, "Mendelian genetics needs to be reduced to molecular genetics" and "general biology needs to be reduced to molecular biology" suddenly became hot topics in both areas of biology and biological philosophy. During these decades, in the meantime, there were also raised strong controversies in these areas.

Some biologists and biophilosophers held somewhat different opinions or even some forceful objections, such as G.G. Simpson (1961, pp.106-107), who said:

It is just that livings have been affected for ... billions of years by historical processes. ... The results of those processes are systems different in kind from any nonliving systems and almost incomparably more complicated. ...The point is that *all* known material processes and explanatory principles apply to organisms, while only a limited number of them apply to nonliving systems. Biology, then, is the science that stands at the center of all sciences.

John Eccles (1966,1974) mentioned that Reductionism is a useful strategy for neurobiological research. However, he argued that "reductionism fails when confronted with the brain-mind problem" (1974, pp.87-108). Ernst Mayr (1985, p.43) held even more forcefully objective positions:

For perhaps a hundred years there has been a strong tendency among philosophers to think that any science is like any other science and that physics could be accepted as the paradigm of science. This I consider to be a grievous error. I hope to be able to show that biology, even though as much a science as the physical science, is also in many ways very different.

Mayr thought that "the physicalists were like one of the blind men touching one part of an elephant" (ibid, p.45). He further argued (ibid, p.54):

Most of what is most characteristic of living organisms cannot be expressed in mathematical terms of the simplistic laws of physics. All this has led to the inevitable conclusion that physicalism is in every respect as unsuitable for a basis of the philosophy of biology as vitalism.

Mayr also suggested (ibid):

As is always the case in intractable scientific controversies, it has become clear that a third option must be found which, in its explanatory model, avoids the weaknesses of both physicalism and vitalism. Such a new approach would have to be based on an understanding of the special characteristics of organisms, and their contrast to the structure of inanimate matter.

Mayr's suggestion is meaningful. However, the big problem is how to "avoid the weaknesses of both physicalism and vitalism". The situation of the arguments between these two theories is just as Mayr has said:

This unfortunate situation is the product of history. When science reawakened after the Middle Ages and when the scientific revolution took place from Galileo to Newton and Lavoisier, it was the physical sciences that experienced this first flowering. Biology as a science was still dormant and did not really come to life until the 1830's or 1840's. For the philosophers, from Bacon, Descartes, and Locke to Kant, the physical sciences, and in particular mechanics, were the paradigm of science. This was so widely accepted that when biology finally developed in the nineteenth century, it tried to model itself as closely as possible on the example of physics. Kant, as has often been cited, claimed that any branch of knowledge contains only as much real science as it contains mathematics (ibid, pp. 43-44).

The controversies between Vitalists and Physicalists (or Mechanists or Materialists) have existed a quite long time up to ancient Greeks (mainly between Aristotle and Democritus). However, when we look at the history of Eastern biophilosophies, there was no such forceful

controversy; because the basic idea of Eastern biophilosophies of Taoism, Confucianism, and Buddhism is Meanism and Harmonism. They considered both mind and material as equally important and all need to be unified and converted to nothingness or pure-mind or absoluteness. Both mind and material are all relativeness, falseness, and temporariness. Thus, there is nothing to be argued. If one argues only the relative, false and temporary but not absolute, true and eternal things, one is really ignorant.

The big weakness of Reductionism is only to emphasize the reduction and parts but not to notice induction and wholeness. However, according to Allan Muir (1982), Reductionism and Holism are compatible:

For reductionism merely insists that higher level variables be expressible in terms of lower ones without the importation of emergent factors, while holism reminds us that each part of a system is constrained by the context of the whole (p.124).

So much for current vogues. I think, though, I'd rather emphasize that a properly dialectical philosophy should refuse to jump down on one side of these dichotomies, but, rather, hold both sides simultaneously in mind (p.130).

Therefore, it is true what Mayr and Muir suggested, "a third option must be found" and Reductionism and Holism are compatible. The integration of the Eastern and Western biophilosophies has to be considered. This is one of the aims of this study.

Chapter 14 Theory of Hierarchy

I. Introduction

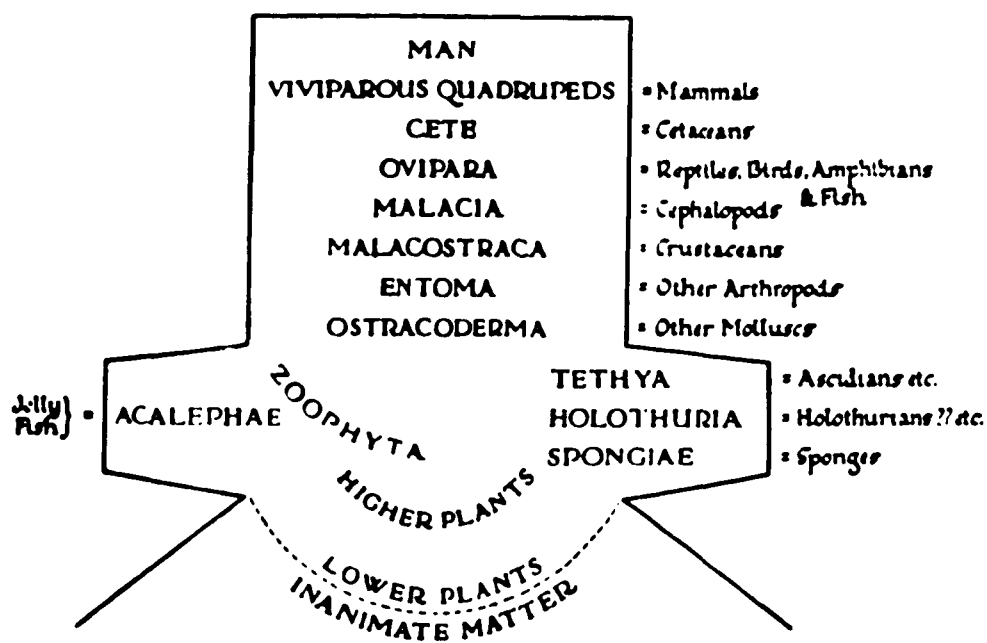
1. Background

In general, one can say that natural sciences are the studies of the knowledge concerning the structures and functions of both the physical world and the living world. The ancient Greek philosophers already began this kind of work. Democritus raised Atomism principally to explain the structures and functions of the physical world. Plato and Aristotle created more theories to explain these as well. Plato classified the properties of living things (Table 25) in his *Republic* and began an alternative developmental discourse in *Timaeus* (J.van der Meer, 1989).

Table 25 Plato's classification of the properties of living things in his *Republic*
(modified from van der Meer, 1989 and Salthe, 1991).

Function	Plants	Animals	Humans
Desiring	+	+	+
Spiritual	—	+	+
Rational	—	—	+

Aristotle's theory of the great chain of beings for the first time established a hierarchical system of living things (Fig.46).



The *Scala Naturae* or 'Ladder of Life' according to the descriptions of Aristotle.

Fig. 46 Aristotle's Classification and Hierarchical Systems of Living Beings (after Singer, 1950)

In 1828, von Baer's law was published which actually demonstrated a specified hierarchical idea of living beings in embryological developmental stages (Salthe, 1988). In 1859, the publication of Darwin's theory of evolution further demonstrated the dynamic formation of hierarchical systems of living beings. Bertrand Russell (1903) also dealt with the basic structure of a hierarchical system.

It may be said that hierarchy theory was developed from Organicism. The organicists J.H. Woodger (1929, 1930a, 1930b, 1931), von Bertalanffy (1933, 1952), J. Needham (1936, 1937, 1943), and P. Weiss (1939, 1968, 1969) all emphasized the idea of hierarchical organization. The concepts of development and ontogenetic trajectory were also introduced from Organicism. The concepts of agency and self-organization evolved from Vitalism.

In a certain sense, the basic concept of hierarchical organization of this theory is the reverse direction of Reductionism, and some concepts came from modern physical theories and the second law of thermodynamics.

2. Definition

What is the hierarchy theory ? It can be defined as a doctrine that deals with the organization, function, and development of the entities both of the physical and the living world, as a series of different scales or levels, ranks or orders. This study emphasizes mainly on the living world, which different biophilosophers view in very different ways. Here, according to Salthe (1985):

The world would be a field wherein processes of different frequency interact in various complex ways. We would not treat ourselves as things but as foci for processes. In actual fact such a viewpoint would be largely translatable into a thing viewpoint and vice-versa. Tiny things would become high-frequency phenomena; long waves would become big things (p. 17).

Levandowsky and White (1977) as well as Allen and Starr (1982) were the early examples of process-oriented works. According to this kind of viewpoint of the world, Salthe defined his hierarchy theory as follows:

Hierarchy theory, then, is a theory about the interactions of phenomena of different scale, and it is a metatheory in the sense that it proposes that theories devoid of scale considerations are going to be defiant. The hierarchy theory in this work, however, goes further and, being entity oriented, proposes in addition that boundaries must be taken into consideration if we are to make sense of the world (ibid).

Salthe further mentioned some additional views about the concept of hierarchy theory:

We don't really know that there are *things* smaller than we can see. There are forces we can detect that we represent as the result of actions of smaller-scale phenomena. In this sense the hierarchical representation discussed above is a theory about the nature of the world. Actually it is a metatheory---a theory about theories. What it proposes in part is that theories be couched in terms of individual entities (ibid, p.16).

II. Basic Concepts

1 The Concept of Entity

The material basis of hierarchy theory is individual entity, as mentioned above. So, in defining an entity we have to deal with the conceptions of "thing" and "object". According to Reed and Jones (1977), Pattee (1978), 'object' implies what a thing is operating upon by an observer, maker, or doer (subject). And according to Salthe:

It is fundamentally a psychological or experiential concept and has an irreversibly diadic structure---'object' makes no sense without 'subject' (ibid, p.22).

Hull (1978, 1980a,b) defined the concept of 'entity', which may accommodate more than just things. However, Salthe defined 'entity' just "as a representation of 'thing'." (ibid). He further claimed:

Formal definitions are parts of our construct, Nature; things are, on the other hand, out there, in the unknown wilds. Like most definitions 'entity' has the logical structure of a class; any thing can be a member of the class 'entity', and may be represented as 'an entity'. ... Thus, objects are experienced, things are believed in, and entities are defined, but the three become interlaced in hectic experience (ibid, pp. 22 - 23).

2 The Concept of Development, Evolution or Individuation

Concepts of development and evolution or individuation in the hierarchy theory are somewhat emphasized the concepts of change and orientation. This is the only point which needs to be mentioned here. According to Salthe:

Change in systems has been looked at in two different ways, which, while logically distinct, are in fact mutually compatible. One way, concerned to discover dynamic regularities in the interests of prediction and control, constructs a developmental discourse. ... The other, with the aim of understanding the mediation of history into the system, constructs an evolutionary discourse. These two ways of knowing actually almost always take place in mutual exclusion, probably because of their logical difference (1989, p. 200).

In this way of understanding, Salthe defined "development" as the "predictable irreversible change" and "evolution" or "individuation" as the "irreversible accumulation of historical information". In addition, there is another important difference between these two processes: development is directed by the genetic information stored in genome of living beings but evolution is not. However, they are all controlled by physical laws as well (ibid).

3 The Concept of Self-Organization

According to Salthe (1989), self-organization is the mode of change of systems that both develop and evolve. Jantsch (1981) mentioned that this term emerged from Hegelian discourses in Europe, and that it meant an inner directive power existing as part of the system itself. Depew (1986) pointed out that this is a non-Newtonian concept. Thus, one turns to understand that nature is merely matter in motion directed by its own inner power. The term self-organization is understood in somewhat different views by different workers.

The most common usage expresses that natural systems become more and more organized and complex during their irreversible changing (Brooks, et al., 1988; Ulanowicz, 1986; Wicken, 1987; Winiwater, 1986). Goodwin (1984) emphasized the wholeness and the developmental aspects of self-organizing systems as they change. Allen (1985) and Allen (1981) stressed the ability of the incorporation of alterations caused by unexpected fluctuations.

Salthe (1989) emphasized:

A self-organizing system can also be taken to have the property known as 'agency'. This is to say that it has a part in determining its own individuation, and that it can be taken to have unique effects with respect to interactions with other systems. ... Without agency, a system in interaction with another might just as well have been another of the same type. Without agency, microscopic trajectories are truly interchangeable to give precisely the same final macroscopic state. Even *with* agency, if the final state is defined in a broad enough way, the effects of agency can be ignored (p. 201).

Salthe concluded: "What is important for the present is that this new dimension is opened up by the concept of self-organization." (ibid).

4 The Concept of Ontogenetic Trajectory

Waddington (1956) proposed a concept of "chreod" as a developmental trajectory or canal in his organicist developmental systems (see before). Salthe (1989, 1991) suggested a somewhat similar idea, the ontogenetic trajectory or developmental trajectory, in his hierarchy theory system. According to Bockemuhl (1987), Bortoft (1985) and Brady (1986), Goethe had already come up with this same idea at the beginning of 19th century. Salthe (1989) defined his idea of an ontogenetic trajectory as follows:

The entire life history of a single organism can be taken to be itself an individual of large scale with respect to any one of its moments, each of which would be an organism as it seems functionally to us, but would be merely a time slice from the point of view of the higher level. I have suggested calling this entity the *ontogenetic trajectory* (p.206).

As suggested by Salthe (1989), "the ontogenetic trajectory is the seat of the self-organization which carries the organism through its moments--- the agent proper." The ontogenetic trajectory also always exists in the specification hierarchy (this will be explained later) as shown in Fig.47, which was labelled with Aristotle's hierarchy of functions (Salthe, 1991).

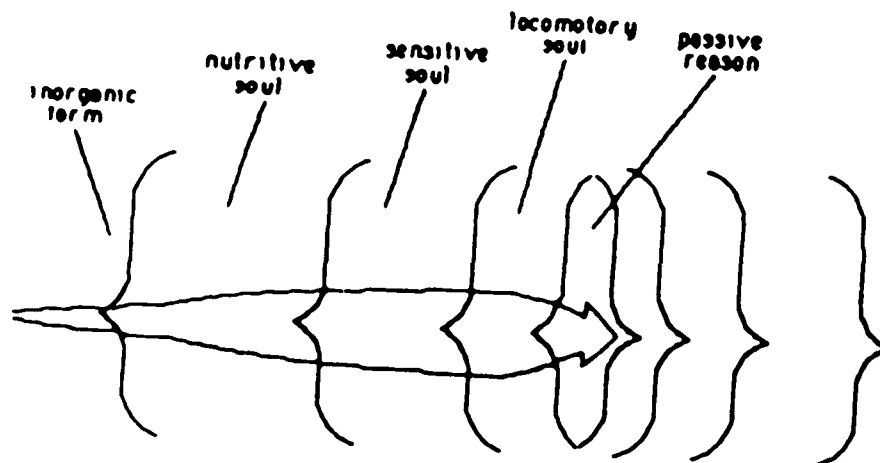


Fig. 47 An Ontogenetic Trajectory (arrow) Shown Penetrating through Development Stages Organized as a Specification Hierarchy and Labelled with Aristotle's Hierarchy of Functions (after Salthe, 1991)

What are the relationships between the ontogenetic trajectory and development as well as evolution or individuation ? Salthe (1989) described as follows:

Development can be taken to be the lower level (organismic) reflection of the ontogenetic trajectory's self-organization and motivated transitional motions. Individuation reflects the difficulty of doing these cleanly in a complicated frictional world.

Self-organization, then, can be taken to be a higher level property with respect to development and evolution, which are relatively lower level. The development of organisms, then, reflects on the one hand, macroscopic thermodynamic necessities, and on the other hand, prepositions held in the kind of ontogenetic trajectory it is part of genes determine microscopic pattern---initiating conditions on organisms; embryonic forms are macroscopic with respect to them and function as boundary conditions on them. The species therefore determines the kind of ontogenetic trajectory ... In comparison, development, as presented above, is an organism level reflection of the self-organization of the ontogenetic trajectory (pp. 206-207).

5 The Concept of Non- Equilibrium Thermodynamical Living systems

The approach of non-equilibrium thermodynamics is being presently applied to the research of self-organizing living systems (Allen, 1985; Brooks, et al., 1986; Juntsch, 1981; Johnson, 1988; Prigogine, 1980; Ulanowicz, 1986; Wicken, 1987; and Yates, 1987). The importance of the application of this approach to the biological field, according to Salthe (1989), is as follows:

It presents a theoretically framed phenomenology that provides powerful unifying descriptors of some developmental aspects of self-organizing systems of all kinds, thereby giving rise to a basic developmental discourse that can form the foundation for further elaborations, including evolutionary ones in information-rich systems. This perspective comes especially from concern with the origin of life (p. 202).

S.W. Fox (1986) emphasized that living systems emerged from organic dissipative structures, and much of the phenomenology of life predates them, such as: communication across membrane boundaries, metabolism, directed transformations, entropy production, replication, and informational constraints (also see Salthe, *ibid*).

Salthe (1989) summarized that during the process of development there are at least four regularities shown by the non-equilibrium thermodynamical open living system.

Two of them express in increasing way, they are:

(1) the stored microscopic and / or macroscopic information (also see Brooks, et al., 1986; Jorgensen, 1988; Laszlo, 1987; Margalef, 1968; Odum, 1969; Schneider, 1988; Ulanowicz, 1986; and Wesley, 1974).

(2) the internal stability (also see Brooks, 1986; Odum, 1969; Wesley, 1974; and Zotin, 1972). Other two express in decreasing way, they are:

(3) the intensity of energy flow, i.e. weight-specific basal metabolic rate (also see Hershey, et al., 1987; Margalef, 1968; Odum, 1969; Schneider, 1988; Trinscher, 1965; and Zotin, 1972).

(4) the stability against to the external perturbations (also see Hershey, et. al., 1987; Holling, 1986; Laszlo, 1987; Margalef, 1968; May, 1973; Strehler, 1962; and Zotin, 1972).

The first and third combine to form the Lotka-Odum maximum principle, which is the major thrust of immature systems. The first three together can reflect Prigogine's principle of minimum entropy production, which can only be tested when the system starts senescence.

6 The Concept of Organic Dissipative Structure

Salthe (1989) defined the "organic dissipative structures" as "thermodynamically open systems with definite closure." However, there are yet some debates "whether living systems should be taken to be dissipative structures or not" (p. 202). Salthe stressed:

Like natural dissipative structures, they burgeon into far from equilibrium forms in their youth, and gradually decay toward equilibrium, some kinds perhaps actually reaching near-equilibrium conditions before they disintegrate altogether (ibid, also see Zotin, 1972).

F.E. Yate (1987), like many biologists, argued that living systems could not be dissipative structures due to the stability of their genetic information. It is true that genetic information has a relative stability in living systems. However, they are still members of dissipative forms---"systems of the third kinds" of Laszlo (Laszlo, 1980). According to Salthe:

Probably such forms could eventually be classified according to the amount of internal stored information they carry, and that would no doubt correlate positively along a gradient from more explosive to more sedate developmental trajectories (p. 202).

III. The Hierarchical Structure of the World and Living Systems

Are there any basic structures or orders of the world (both physical and organic), and if so, what are they? Not many have been proposed in Western philosophy and they are incomplete. Salthe (1985, p.9) summarized some of the previous publications and made some of his own suggestions for a relatively ideal world structure:

It must be a structure that allows causal relationships to exist as well as relationships of control. It must be a structure that will generate complexity (Buchler, 1966); Wimsatt, 1974; Mandelbrot, 1977). It must be a structure that is spontaneously stable (Simon, 1969; Soodak, and Iberall, 1978). It must be a structure that generates things, boundaries (Simon, 1969; Mandelbrot, 1977; Soodak and Iberall, 1978), at least in our interaction with it (Salthe, 1985). Very few will do all these; one that will is hierarchical structure---that is, nature viewed as a hierarchy of entities existing at different discrete levels of organization (Koestler, 1967, 1978; Dawkins, 1976; Bunge, 1979; Allen and Starr, 1982).

1. Some Previously Proposed Hierarchical Systems

Before 1980's, there were mainly six hierarchical systems to be proposed, i.e. Teggart, 1925/1977; Wright, 1964; Valentine, 1968; Conrad, 1976; MacMahon, et al., 1978; and Bunge, 1979. These are briefly shown in Table 26 and 27.

Table 26 Three Hierarchical Systems before 1970's

Teggart, 1925	Wright, 1964	Valentine, 1968
stellar universe	world biota	total biota
physical earth	*local biota	*biotic province
*organic life	species	*community
*human activities	deme	deme
nation	multicellular organism	*population
local community	*organ	phenotype
organism	*cell	character
	macromolecule	gene
	* molecule	(genetic understanding)

According to Salthe (1985), Teggart (1925) mixed levels of generality (*) with levels of organization, and Wright (1964) as well as Valentine (1968) used both ecological (*) and genealogical levels mixed in one hierarchy.

Table 27 Three Hierarchical Systems before 1980's

Conrad, 1976	MacMahon, et al., 1978	Bunge, 1979
community population organism ↙ ↘ phénome genome	etc family genus ↙ ↘ species community ↙ ↘ population ecosystem deme organism organ tissue subcellular structure molecule atom subatomic particle	biosphere ecosystem population organism organ cell

Conrad's system is relatively simple and that of MacMahon, et al.(1978) is much more detailed. All of these six hierarchical systems are mixed ones, which have not yet be classified according to their properties.

2. Salthe's Classification of Hierarchical Systems of the World Structure

On the basis of summarizing the previously proposed hierarchical systems, Salthe (1985) proposed a view of dichotomically classified hierarchical structures (Fig. 48).

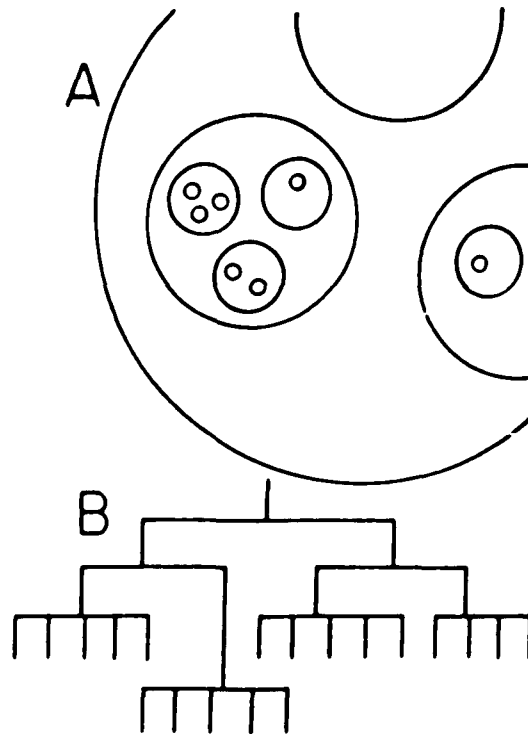


Fig. 48 Diagram of Dichotomically Classified Hierarchical Structures.
 (A) Compositional Hierarchy; (B) Control Hierarchy (after Salthe, 1985, p.10)

According to this classification, there exist two types of hierarchical structures in the world, the compositional and the control. The entities of the compositional one is nested, while that of the other may be or may not. Under this kind of viewpoint, Salthe stressed his hierarchically structural concept of the world as follows:

It will be the view of this work that the world is ordered in both of these ways simultaneously and that, since nesting has characteristics of both, the material aspects of the world are ordered in a nested manner. Some things are very big---- e.g. the world--

-- and others, smaller, are found within them as *parts* (1985, pp.10-11).

Under this viewpoint of hierarchical structures, at meantime, it makes the part-whole relationship very clear. So, Salthe further mentioned:

We note the very important part-whole relationship. Everything has parts ; everything is also a part of something... . Everything controls its parts and, as a part, is controlled by the whole it is part of. Things that are both parts and wholes simultaneously have been dubbed "holon" by Koestler (1967), and so, in our view things in the world are all holons (ibid).

The compositional-control dichotomic classification is dealt with in relatively general view of the hierarchical world structure. Thus, Salthe further made another dichotomic classification of the hierarchical structure of the world, the ecological-genealogical dichotomy (1985, p.185), from relatively more biological point of view, shown in Table 28.

Table 28 Ecological-Genealogical Dichotomic Classification of Hierarchical Structures

Ecological Hierarchical Levels	Genealogical Hierarchical Levels
the surface of the earth	total biosphere
biogeographical region	historical biota
ecosystem	monophyletic lineage
population	species
organism	deme
molecule	integrated genotype-phenotype
	gene

This dichotomic classification is expressly different from the previous ones.

More recently, Salthe (1987, 1989, 1991) has developed another new dichotomic classification

of hierarchical structures, the scalar hierarchy and the specification hierarchy. The scalar hierarchy is "composed of levels of organization or scalar levels, which are formally a serially ranked set of classes representing parts and wholes, with the highest level representing the more inclusive supersystem" (1987, p.2). Actually, both of the ecological and the genealogical hierarchies belong to this type.

The specification hierarchy is "composed of levels of organization or integrative levels, which are formally a nested set of subclasses with intentional definitions. Their relationships to each other are transitive." (1987, p.1). The structure of this type of hierarchy can be shown in Fig. 49.

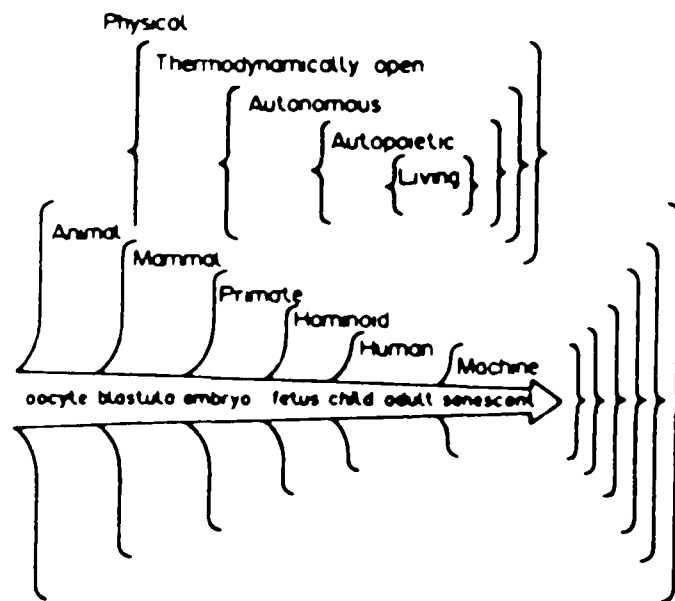


Fig. 49 A Diagrammatical Illustration of the Nested Types of Specification Hierarchy Systems. The lower portion is nested within the upper. The arrow represents the ontogenetic trajectory of an individual human being (after Salthe, 1989, p.204).

Like Fig.47, we can also see, from Fig.49, that a specification hierarchy always accompanies an ontogenetic trajectory. Specification hierarchy has possessed a long history, since Plato and Aristotle (J.van der Meer, 1989; Salthe, 1991). Thus, Salthe emphasized:

We now move to an important use of the specification hierarchy that began with Aristotle, and has continued to the present day. What Aristotle did was to make Plato's specification hierarchy serve as a system of benchmarks for development, using the integrative levels as stage of development (Salthe, 1991, p.6).

It is very interesting to note just as Salthe has pointed out that " the stage of meditation as described in the Ch'an tradition is a traversing of integrative levels in the reverse direction, from detailed engagement with the world to more and more general mind states, culminating in "nothingness" (1991, p.9). This is a very important matter that the process of ch'an (Zen) meditation and ch'an enlightenment is just in reverse direction which contracts to the development of a specification hierarchy. Thus, it may be said that the process of Ch'an meditation and Ch'an enlightenment is a process of "de-specification". It is due to the true life or true mind to be formless, timeless and dimensionless.

The another interesting thing is concerning the nested structures. It may be also said that the structure of the Buddhist three levels (the 1st level--the 1st 6 consciousnesses, the 2nd level--the 7th consciousness, and the 3rd level--the 8th consciousness) of conscious-mind is also nested. Thus, the approach of Ch'an meditation, just like the teaching of Ch'an Patriarchs (Luk, tr., 1966; Wong, tr., 1930/1990), is to "destroy" these conscious-mind nests. If one can not destroy them, one can not achieve enlightenment. If one can not destroy, especially, the 8th consciousness, one can not reach thorough enlightenment (cf. Chapter 9).

Part-III A Dialectic-Unified-Monism of Life: Bio-Meanism

Comparisons, Syntheses and Complements of Eastern and Western Life Theories

Introduction to Part-III

In Part-I and -II, Eastern and Western biophilosophical theories of life have been discussed, respectively; and some of their concepts have been also compared with each other. Now, some of the most essential concepts and problems of the two are attempted to make some further comparisons. Next, some syntheses and complements between them will also be tried.

The Eastern essential concepts are: Fushi's and Shakyamuni's dichotomic dialectics; Taoist and Confucian Wu-Ji (absoluteness), Tai-Ji (oneness), Yin-Yang (relativeness), Chi (subtle energy), Reason and natural cyclic changes; and Buddhist *bhutatathata* (or *dharmakaya*, *nirvana*, dharma-nature, self-nature, emptiness, nothingness, true-mind, absoluteness), conditioned arising (or dependent origination, relativeness), karma-force, rebirth, retribution, transmigration, intuitive observation, self-regulation, self-deduction, reductive illumination, and perfect-harmony.

The Western essential concepts are: Socrates' and Plato's *eidos*; Plato's dichotomic dialectics; Aristotle's *dynamis*, *energeia*, *entelecheia*, and *pneuma* of old Vitalism; Driesch's entelechy, harmony and regulation, analytic and autonomic morphogenesis of neo-Vitalism; Spemann's and Needham's organizer and inducer, Weiss' morphogenetic field, Waddington's developmental canalization and chreod of Organicism; Ayala's ontological and epistemological reduction of Reductionism; and Salthe's and other's hierarchical organization.

The Buddhist dialectics is governed by the mean or *madhyamika*, i.e. it is neither idealistic nor materialistic. Therefore, it may be said that Hegel departed from this idea to develop his dialectic idealism (discussion in Chapter 15); and that Marx and Engels went further astray from Hegel's dialectic Idealism in formulating dialectic Materialism. Both dialectic Idealism and dialectic Materialism are biased against real dialectics. Therefore, it may be said:

Both Idealism or dialectic Idealism and Materialism or
dialectic Materialism are not dialectic.
Dialectics is neither idealistic nor materialistic,
it is meanistic or *madhyamika*.

Thus, it was not appropriate for Needham to apply dialectic materialistical idea in explanation of his Organicism (see Chapter 12). In this study, every type of materialism, idealism or dualism will be avoided. On the basis of the Buddhist theory of *madhyamika* and the Taoist and Confucian idea of mean, an idea of bio-meanism, a dialectic-unified-monistic system of life is suggested, to which real dialectics is applied.

In the bio-meanistic system, a new definition of life is defined; a series of new ideas of life are suggested, such as: noumotype of life or noumo-life, phenotype of life or pheno-life, life-force, life-energy, bio-energy, life- / mind-fields; and two types of germ-line, inheritance and evolution are also been proposed. The pheno-life is dealt with as being a feature of energy, and noumo-life as the existence of pure-force, which is expressed in or actualizes various features of energy.

All primary genetic information, both mental and physical, are stored in the 8th consciousness in the various forms of life-energy or karma-force as life-seeds or genes (mental and physical). The different forms of life-energy or life-seeds are always displayed in circulation and transformation, and is completely conserved. The conservation of life-energy is rooted on the fact that life-force, i.e. noumo-life, has the character being without birth or death, and increase or decrease. Only life-force is true-life.

The paradigm of life of modern Western biology has become more and more materialistic in focus, and the concept of true-life has been gradually lost. The aim here is to unite the idea of true-life with that of the "vacant physical body" in order to preserve and keep living conditions. This kind of true-life can be identified or verified by using appropriate Eastern approaches.

In this study, the paradigm of life is defined as the composition of two categories: the first is noumenon, noumotype of life, noumo-life, or true-life; the second is phenomenon, phenotype of life, pheno-life, or false-life. According to the concept of perfect-harmony, these ideas are harmonious and complementary to modern Western biology and helpful to perfect it.

Western modern life sciences have made a tremendous progress, especially since the development of molecular biology, but there still are open many problems. These includes: what is life, the mind, the true relationships between mind and body, the real nature of fertilization, the force which starts the first division of a fertilized egg; why cells, chromosomes, genes, and double helical DNA molecules duplicate and divide automatically and in an orderly way; what is the true nature of genetic-program, behind the genetic-program which determines and controls the morphogenesis of shape, form and type formation; what is the agency which controls the regulation and regeneration after damaging the body, the process which may allow life, mind, or consciousness to still exist after death, and the true meaning of birth and death. These are just a few of the dozens of questions to be asked.

The answers to these questions are the responsibility of scientists, particularly biologists and biophilosophers. This study attempts to frame answers for some of them in the belief that the concepts of Eastern biophilosophies may be helpful.

It is also believed that both Eastern and Western philosophies or biophilosophies need to be integrated and complementary. Modern physics, especially quantum physics, has already begun well in this such kind of attempt (Capra, 1975; Zukav, 1980; Davies, 1984; and Mansfield, 1989, 1990).

Now, modern biology need the same effort, and this study may be a beginning in the field of biology / biophilosophy.

Chapter 15 Comparisons of Eastern and Western Research Objects Tools and Approaches of Life

I. Introduction

In order to synthesize, integrate, and complement biophilosophical concepts of both the East and West and to make some innovations, it is needed to firstly compare them and find their similarities and dissimilarities. Therefore, in this part, there are three things concerning life to compare in the first three chapters: (1) research objects, tools, and methodology; (2) concepts of laws and theories; (3) concepts of noumenon and phenomenon.

Of these three, it is thought that the last one may be the most basic and important one.

Now, in this chapter, the first aspect is compared first.

II. Comparisons of Research Objects

I. Comparison of the Classification of Animate and Inanimate Things

Here, the classification systems of Shakyamuni in Buddhism and that of Linnaeus in Western biology are compared.

The basic similarity, between these two systems, is that the classification of animate and inanimate things identically use dichotomic method. In the classification of animate and inanimate things in Buddhism, there are several points different from that of Linnaeus. These

are: (1) The first dichotomy divides things into *sattva* or sentient-beings, with mind and emotion, and *asattva* or non-sentient-beings, without mind and emotion (plants belonging to this category). (2) Division criteria place more emphases on mental conditions, especially on the conditions of enlightenment or delusion. (3) There are more types of sentient-beings. (4) The spatial region is the whole universe, not restricted to the earth.

The Buddhist classification is shown in Fig. 50 (also see Figs.6 & 7).

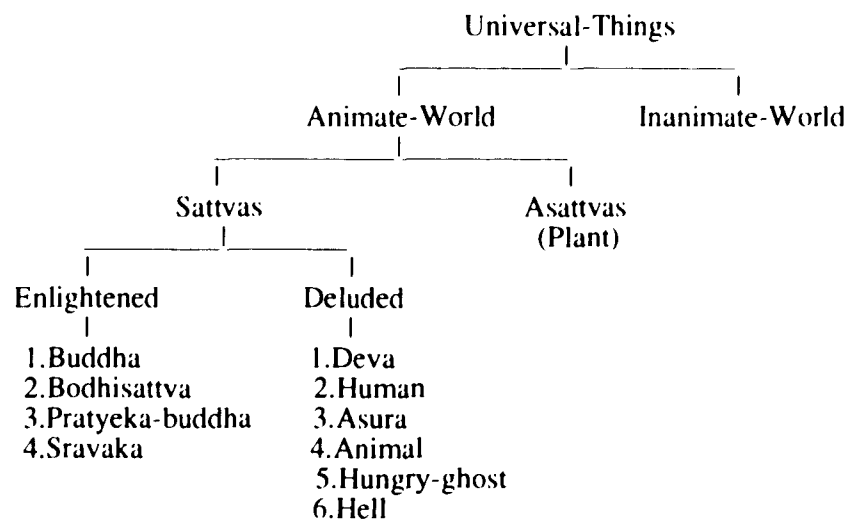


Fig. 50 The Dichotomic Classification of Things in Buddhism

It has been pointed out that Eastern biophilosophical approaches emphasize inner observation to increase the ability of one's own wisdom, which enhances one's resolving power / capacity. Shakyamuni, in this way, greatly enhanced his resolving capacity and felt strange about seeing the universal things, both *sattvas* and *asattvas*, immediately after his enlightenment. In the ten hierarchies (the four of the enlightened and the six of the delusive, see Fig.50) of *sattvas* only human-beings and animals were seen before his enlightenment (the same as in the present). Because the resolving capacity of human's sensory organs are

limited, such as sight being narrowed between ultrared and ultraviolet rays, a layman can not see the other eight hierarchies of *sattvas* even with the aid of present scientific instruments. Since Shakyamuni and some of his followers, who were also enlightened, could see them, we can as well if we also attain complete enlightenment and / or develop some new and fine equipment. Some persons believe that there is new psychological evidence, which suggests that life may still exist after one's death (Franz, 1987). It is possible that some things, which were never believed before, will appear during the continuing progress of science.

Therefore, this classification system, in which something (such as that of hells) seems not to be acceptable, can help stimulate and promote thinking to consider the universe and life in a more broad fashion, and not be limited to the earth, animals and human-beings. It is introduced here to be considered as bioscientific or biophilosophical exploration rather than religious faith and belief. It is possible to suppose that different physical bodies of the universal beings may be characterized by variously different lengths of electromagnetic waves or something else, which can only be seen by very high resolving power of sensory ability, like that of Shakyamuni's and are out of ours.

The Western research objects of life system, which were classified by Linnaeus dichotomically are briefly shown in Fig.51. This system only includes those existing on the earth.

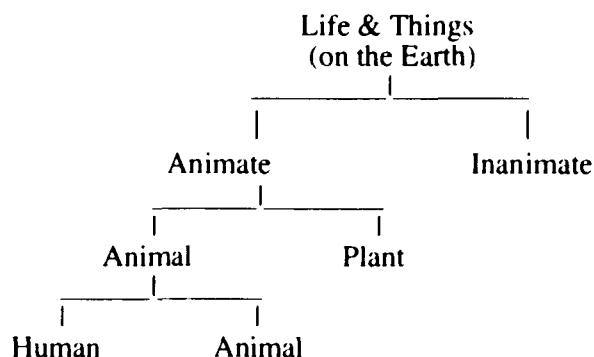


Fig. 51 The Linnaean Dichotomic Classification of Life and Things on the Earth

2. Comparison of the Classification of *Hierarchies of Soul*

Needham compared what was called by him the *hierarchies of soul* between Aristotelian and Confucian systems, shown in Table 29 (Needham, 1969, pp.21-26).

Table 29 Comparison of *Hierarchies of Soul* between Aristotelian and Confucian Systems

Systems of	Things	Hierarchies of Soul
Aristotle (4th cen. B.C.)	Plants Animals Human-beings	Vegetative soul Vegetative soul + sensitive soul Vegetative soul + sensitive soul + rational soul
Hsun Chhing (3th cen. B.C.)	Water and fire Plants Animals Man	Chi (or energy) Chi + Seng ¹ Chi + Seng + Chih ² Chi + Seng + Chih + I ³
Liu Chou (6th cen. A.D.)	Plants Animals	Seng Seng + Shih ⁴
Wang Khuei (14th cen. A.D.)	Heaven, sky, rain, dew, frost & snow Earth Plants & some minerals Animals Man	Chi Chi + Hsing ⁵ Chi + Hsing + Xing ⁶ Chi + Hsing + Xing + Ching ⁷ Chi + Hsing + Xing + Ching + I

Notes: (1) *Seng* means life; (2) *Chih* means sensation; (3) *I* means righteousness or rational; (4) *Shih* means consciousness; (5) *Hsing* means form; (6) *Xing* means nature; and (7) *Ching* means emotion.

From Table 29, we can see that the concept of confucian “Chi” may be basically similar to that of aristotelian “soul”. However, the former is more broader than the latter, which does

not include the inanimate. The concept of aristotelian “soul” is probably more similar to that of Hsun-Chhing and Liu-Chou’s “Seng” (life) and that of Wang-Khuei’s “Xing” (nature).

Comparing the concepts of confucian “Chi” and aristotelian “soul” to that of Buddhist “mind” or “consciousness” is complicated, and it is now to try to make a preliminary comparison.

The earliest biophilosophical concepts were Fushi’s Ying-Yang (positive-Negative) theory (4498 B.C.), raised in his *I-Ching* or the *Book of Changes*. The most concrete and broad ones are Shakyamuni’s series, such as: the theories of: *the six-way transmigrations of Life, the five-skandhas and twelve-nidanas of life, the bhutatathata and nirvana of life*. All of these were established on the basis of *the law of cause and effect* (see Part I).

Needham compared the *ladder of souls* (or *hierarchies of life*) of Aristotle with that of three Confucianists (1969, pp.21-26). However, he did not include any comparison with Shakyamuni’s. Using Needham’s comparison, it is here that all these theories of the hierarchies of life are compared in Table 30.

From Table 30, one can see that the *hierarchies of life* of Shakyamuni are the most extensive, in which it includes life on this earth as well as that of the universe. Shakyamuni had an universal idea of life, while Aristotle and Confucianists did not. This wide difference occurred because he discovered effective approaches to enlighten and enlarge his wisdom and ability to sense, which enabled him to conceive this broad view, while Aristotle and Confucianists did not have this availability to them.

Table 30 Comparison of the *Hierarchies of Life* of Three Theories

Names	Hierarchies of Life	
Shakyamuni's (6th cen. B.C.)	Physical things	No Buddha-nature, no soul, physical-karma
	Plants	No Buddha-nature, no soul, plant-karma
	Delusive-beings	
	Hells	With Buddha-nature, mostly bad karma
	Hungry-ghosts	ibid, with less bad karma
	Animals	ibid, again with less bad karma
	Malevolent-spirits	ibid, again with less bad karma
	Human	ibid, with moderate bad karma
	Deva-existences	ibid, with least bad karma
	Enlightened-beings	
	Sravakas	Buddha-nature basically recovered
	Pratyeka-buddha	ibid
	Bodhisattvas	Buddha-nature mostly recovered
	Buddhas	Buddha-nature fully recovered
Aristotle (4th cen. B.C.)	Plants	Vegetative soul
	Animals	Vegetative soul + sensitive soul
	Human-beings	Vegetative soul + sensitive soul + rational soul
Hsun Chhing (3th cen. B.C.)	Water and fire	Chi (or energy)
	Plants	Chi + Seng
	Animals	Chi + Seng + Chih
	Man	Chi + Seng + Chih + I
Liu Chou (6th cen. A.D.)	Plants	Seng
	Animals	Seng + Shih
Wang Khuei (14th cen. A.D.)	Heaven, sky, rain, dew, frost & snow	Chi
	Earth	Chi + hsing
	Plants & some minerals	Chi + hsing + xing
	Animals	Chi + hsing + xing + Ching
	Man	Chi + hsing + xing + Ching + I

The life-hierarchy concept in this study is principally based on Shakyamuni's theories, and integrated with some Confucian and Western concepts.

3. Comparison of Research objects of Life

In the last two sections, the classifications of the animate-inanimate things and the *hierarchies of soul* have been compared. These objects are all with form (or semi-form like wave) and mass (or semi-mass like the basic energy-particle-unit) and thus belong to the pheno-world. Because beyond this pheno-world, there is a more important background of the pheno-world, that is the noumo-world, which is both formless and massless.

Concerning these two worlds, the research emphases of the East and the West are different. Western researches mainly emphasize the physical pheno-world or pheno-life --- the external nature. In the West, about the noumo-world, most biologists, scientists and materialists even deny its existence; and some vitalistic biologists as well as idealistic philosophers in some extent realize its existence but lacking certain efficient approaches to identify its true existence.

However, in the East, the research object more emphasizes the noumo-world, because the pheno-world is thought of only falseness (or false-life) and the temporary aggregates by conditioned-arising, which are only delusions and not eternal. Therefore, the research emphasis is to use certain approaches to identify the true existence of the noumo-world or true-life.

Because of this difference on the research objects, the research approaches and tools are also different. These are discussed in the next section.

III. Comparisons of Research Approaches and Tools of Life

There are some similarities and dissimilarities in the methodology for the investigation of the universe and life in both Eastern and Western worlds, which will be discussed latter. It is here to first mention a basic difference between them.

The common characteristic of the methodology of Eastern biophilosophies, i.e. Taoism, Confucianism, and especially Buddhism, is to emphasize upward movement or inner observation to attain a psychologically transcendental reduction of the absolute noumenon of life (true-life). The common characteristic of the methodology of Western biophilosophies, i.e. Vitalism, Organicism, and Reductionism, is to emphasize downward movement or outer observation. This is true of Reductionism especially, and Vitalism to a lesser degree, which analyze physical bodies mechanically, or to say, biophysically and biochemically, moving toward a molecular level of life.

1. Comparison of Theoretical or Formal Logical Approaches

In both worlds during ancient times, theoretical or logical approaches were developed to investigate universal things. Here, only Greek and Buddhist philosophies are compared. Although the purposes in the application of these approaches somewhat differ, there still exist some similarities.

1.1 Approaches of *Hetuvidya* Tristatement and Aristotelian Syllogism

The comparison of the structures of two formal logical approaches, between Buddhist *Hetuvidya* Tristatement and Aristotelian Syllogism, is listed in Table 31.

Table 31 Comparison between *Hetuvidya* Tristatement and Aristotelian Syllogism

Procedure	System
A. Tristatement:	<i>Hetuvidya</i> Comparing-Inference System
(1) <i>Patijna</i> (Proposition)	Aluminum can conduct electricity
(2) <i>Hetu</i> (Cause)	Because aluminum is a metal
(3) <i>Udaharana</i> (Example)	
Analogy	As far as they are known up to date, other metals can also conduct electricity, e.g. copper
Contrast	As far as they are known up to date, those things which cannot conduct electricity are non-metals, e.g. glassware
B. Syllogism:	Aristotelian System
(1) Major Premise	All metals conduct electricity
(2) Minor Premise	Aluminum is a metal
(3) Conclusion	Therefore aluminum can also conduct electricity

Table 31 shows that, apart from some differences between names in tristatement and syllogism and the major premise and the example or conclusion statement, these two types of formal logical approaches of deductive reasoning correspond. However, there are four points to note here:

(1) In comparison with that of the Aristotelian system, the *Hetuvidya* system, in which the example is classified into analogy and contrast, is more comprehensive and dialectical.

(2) The conditional clause “as far as they are known up to date”, in Part A, indicates that the example statement is sound and flexible. On the other hand, in Part B, as far as deductive reasoning is concerned, the major premise is relatively weak, to say that “All metals conduct electricity” seems somewhat arbitrary.

(3) The deductive directions of these two approaches are opposite, i.e. that of the tristatement is from concrete to general, and that of the syllogism is in vice versa. The former more inclines to verification, and the latter is purely deductive.

(4) The *hetuvidya* logical system is not only a regular logical system, and also an epistemological one, named “true-direct-inference approach”. This approach is absent in the syllogistic system, and thus, it cannot be considered as the transcendental realization of the “original face” of the external objective real world.

From these, it seems that the *hetuvidya* system is relatively stronger than the syllogistic system (Wang, 1990a, pp.16-17). Concerning some other contents of the *hetuvidya* approach has been discussed in Chapter 8. However, this logical system is not known by Western philosophers and scientists, and only Bacon’s approaches of deduction and induction are widely used in their scientific research. Therefore, it is suggested that this Eastern logical system of the *hetuvidya* approach is also valuable to be introduced for Western scientific research.

1.2 Approaches of Three Kinds of Dialectics

It is interesting to note that there were three kinds of dialectical approaches established in parallel by scholars in three ancient countries. The earliest one was Fushi’s (4498 B.C.) in China, the second one was by Shakyamuni (563-483 B.C., here we look him as a scholar rather than a Buddhist religious father) in India, and the third one was by Plato (428-348 B.C.) in Greece. The second was developed by Nagarjuna (ca 150-250) in India, by Sen-Chao (384-414) and Chi-Tsang (549-623) in China.

The dialectics of Hegel (1770-1831) may be thought as a result to be influenced by both Eastern and Western dialectics. It is considered according to the fact that, during the mid Nineteenth Century, Hegel already knew all three Eastern philosophical theories (Hegel, 1840, Haldane, tr., 1892, pp. 120-125; 141-147). Needham (1969, p.424) and Stcherbatsky (1930/1958, Vol. I, p. 482-485; 1989, pp.61-62) also commented about this. However, Eastern dialectics is meanistic or madhyamika, but that of Hegel is idealistic. Therefore, it may be said that both Hegel's idealistic and Engel's materialistic dialectics have already been departed from the basic rule of dialectics. Ye (1978), from the view of Tain-Tai Buddhist philosophy, also commented Hegelian idealistic philosophy.

The common characteristic of all these three dialectical methods is dichotomy:

(1) The dialectics of Fushi starts from Wu-Ji (nothingness) and it begins movement to generate Tai-Ji (Oneness), which includes two opposite possibilities, Yin and Yang, and firstly divides into Double-Bearings. By the movement and interaction of Yin and Yang, they secondarily divides into four Appearances; then further divides into Eight Trigrams, and so on till into sixty-four Trigrams. These are shown in Fig. 52 & 53 (improved from Hu, 1989, p.30) and Fig.53, 54 & 55, after Ni, 1990, pp.11-12 &15).

(2) The dialectics of Shakyamuni first divides *Bhutatahata* (Emptiness or absoluteness) into Two-Truths, Absolute-Truth and Relative-Truth (cf. Chapter 1 and 8).

(3) The dialectics of Plato first divides something A into two, a and non-a, then a into b and non-b, again b into c and non-c, and so on, which are shown in Fig.56 (after Chen, 1990, p. 237).

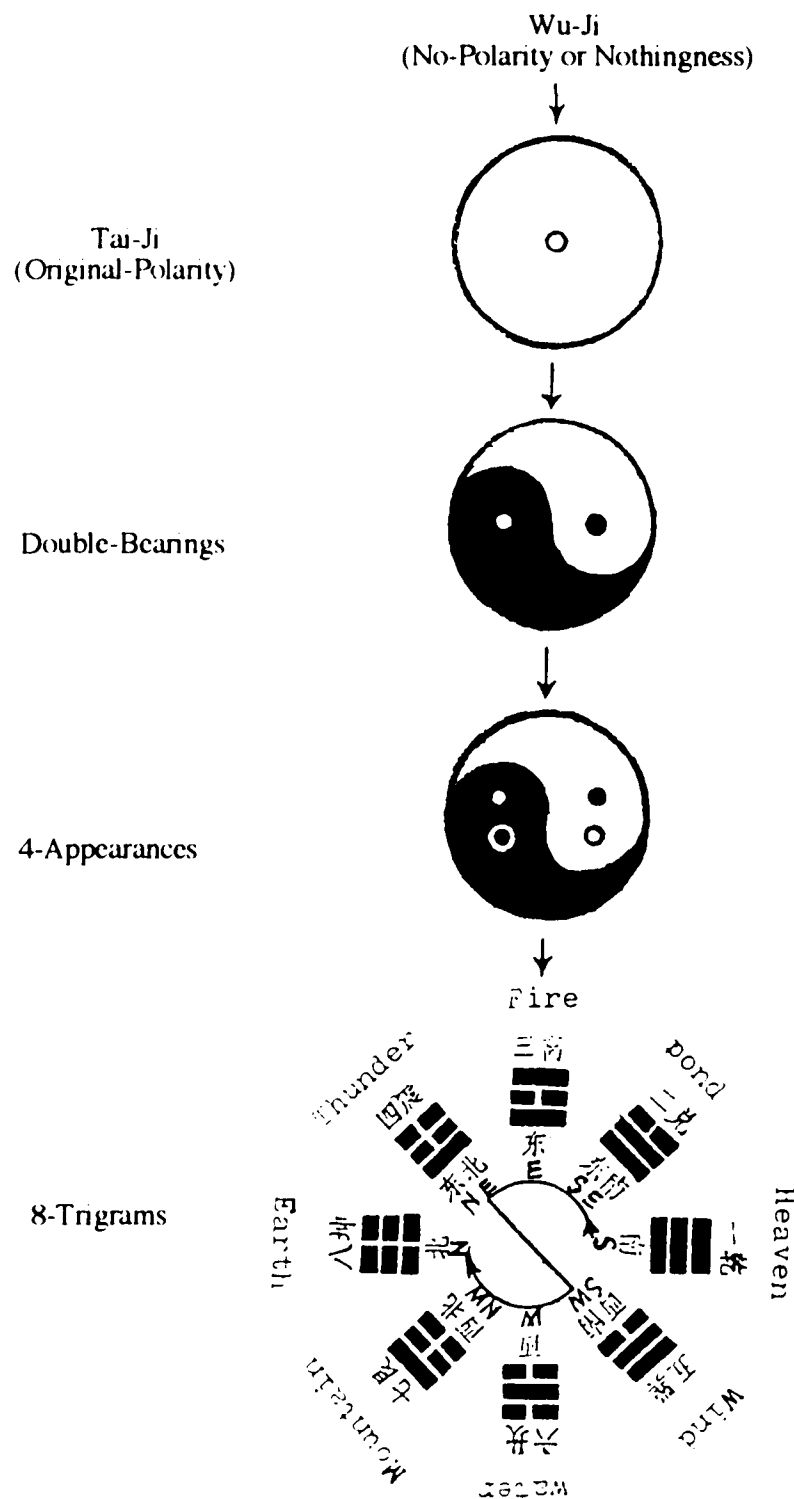


Fig. 52 Illustration of Confucian and Taoist Dichotomic Dialectical Approach (1)

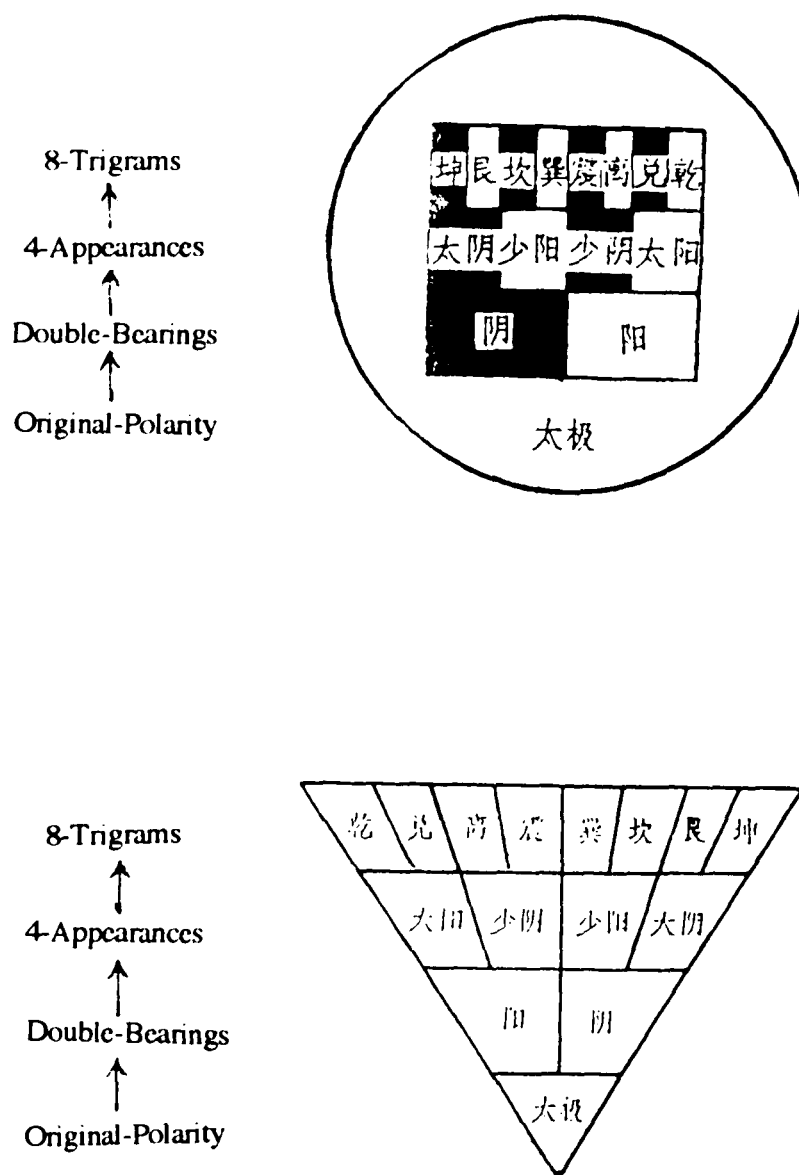


Fig. 53 Illustration of Confucian and Taoist Dichotomic Dialectical Approach (2)

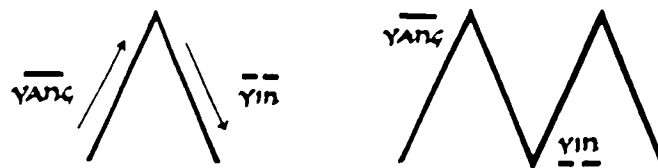
A. The Two Forces

1. The two categories of yin and yang can be expressed as two different lines, one broken and one unbroken:

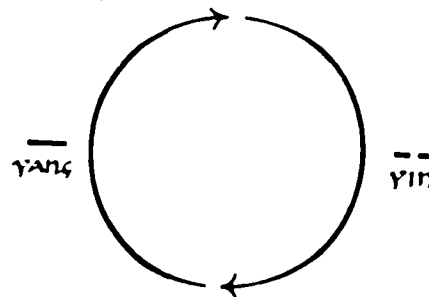
———— and — —

The unbroken line represents yang, the strong force. The broken or separated line represents yin, the weak force.

2. Yin and yang expressed by a slope:



3. Yin and yang expressed by a circle:



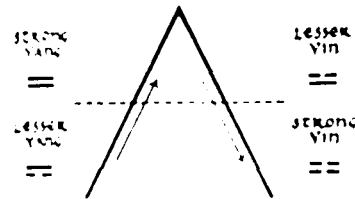
4. The interaction of yin and yang expressing the four phases of universal energy:

====	yang	====	lesser yang
==	yin	==	lesser yin

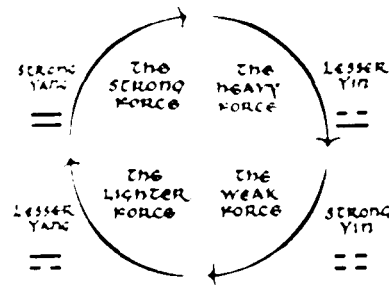
Fig. 54 Illustration of Confucian and Taoist Dichotomic Dialectical Approach (3)

B. The Four Phases of Universal Energy

Expressed by a slope:



Expressed by a circle:



C. The Eight Phases of Universal Energy Expressed by the Trigrams in the Pre-Heaven Arrangement

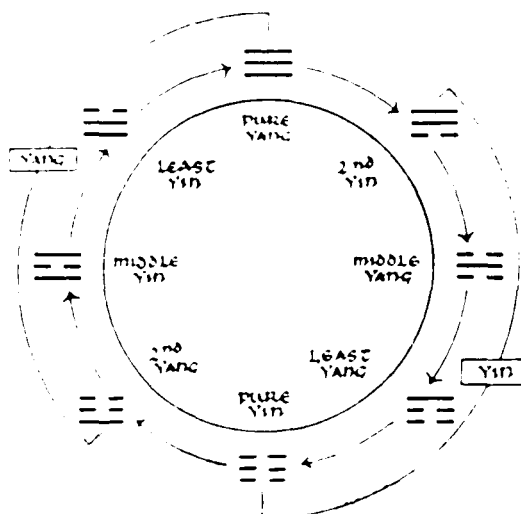


Fig. 55 Illustration of Confucian and Taoist Dichotomic Dialectical Approach (4)

**The Complete Cycle of the Eight Phases
of Yin and Yang**

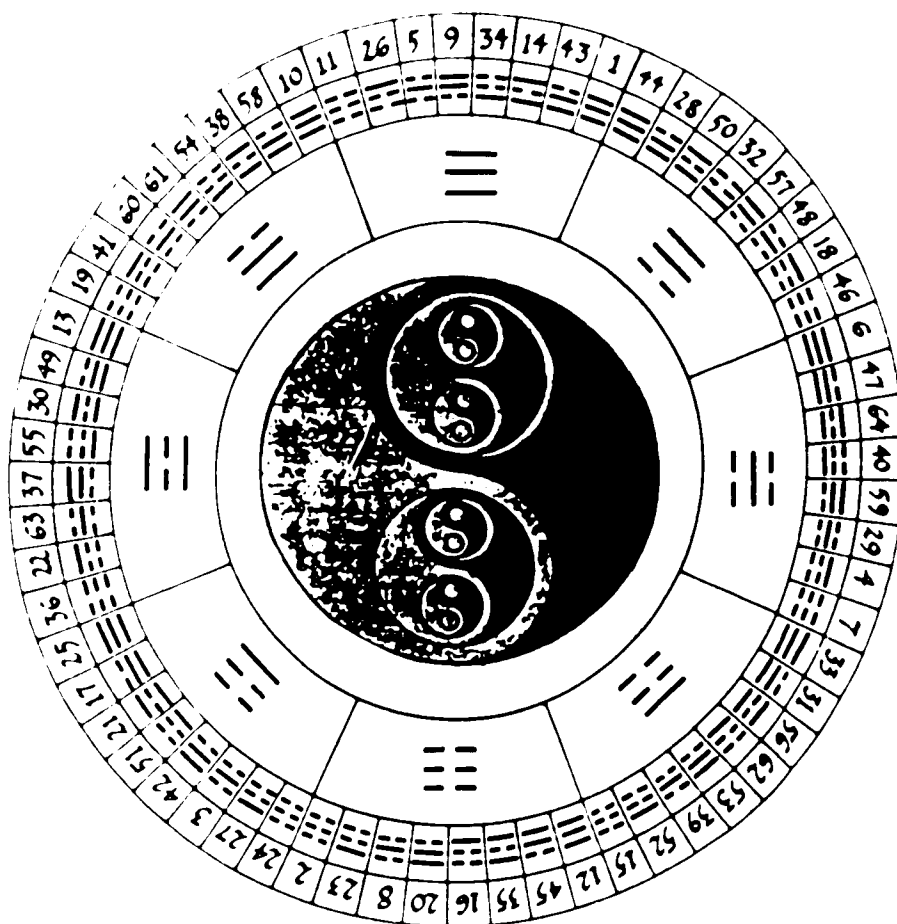


Fig. 56 Illustration of Confucian and Taoist Dichotomic Dialectical Approach (5)

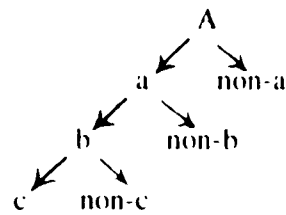


Fig. 57 Illustration of Platonic Dichotomous Dialectical Approach

The common point of the dialectical methods of Fushi and Plato is to dichotomically deduce downward from an origin and an original starting point, separately. They may be, therefore, called deduction dialectics. However, the purpose of the dialectical dichotomic division method of Shakyamuni is to negate existence to turn back to nothingness, i.e. the origin of the universe and life. This may be, therefore, called the reduction dialectics. The detailed processes of this approach see Chapter 8.

2. Comparison of Practice or Experimental Methods

Because the concepts of life in Eastern and Western biophilosophies are quite different, the research methods, especially practical or experimental ones, are naturally quite different too.

Even the directions of each are reversed, upward or inward in the East and downward or outward in the West. However, there are still similarities, which are their common approaches of observations and asking questions: what, why, how, and who.

Thus, among dissimilarities, there are similarities. However, although there are similarities, there still exist dissimilarities. They are shown in Table 32.

Table 32 Differences between Observing and Questioning Approaches in the East and West

Types of Approaches	Differences between Approaches & Their purposes	
	East	West
Observing	1. Chi-gong & Tai-Ji Exercise: Observing inner Chi or energy 2. Form-Observing: in order to negate forms back to pure-mind 3. Mind-Observing: in order to negate false-mind back to pure-mind	Observation & Description: Observing outer phenomena Statistics & Analysis: in order to understand outer world in detail Instrumental Experimentation: understanding outer world deeply
Questioning	Koan, Questioning or Doubting: who, what, why, how am I ? A very important method for Zen to negate false-mind and to attain enlightenment (back to pure-mind)	Only for a thinking method to ask: what, why, and how but not a concrete experimental method

Therefore, it may be said that: (1) the similarities of approaches of practice; (2) the dissimilarities is the difference in direction either internal or external.

3. Comparison of Research Tools of Life

Because the research objects and approaches of Eastern and Western biophilosophies exist big differences: the Eastern ones are mainly toward intuitive mental observation to observe and recover the pure-wisdom, the noumenon of life or noumo- / true-life; and the Western ones are mainly toward external / natural physical observation to observe the physical phenomena of life or pheno- / relative-life. Therefore, the research tools of the two are correspondingly also different.

Eastern ones are: (1) one's physical-body can be looked as a mainly finest instrument to be used for intuitive observing one's own noumo- / true-life; (2) some simple metal and wood instruments, e.g. copper-ball and wood-fish, are used to produce certain sound to focus one's mind for intuitive observation. Western ones are various types of physical equipments, which are developing more and more precisely during modern time.

There are different characteristics of both Eastern and Western research tools. The characteristics of the East are:

(1) The major tool is not dependent on the finest physical equipment(s), but on the enhancement and recovery of one's own pure-wisdom, the self-resolving and sensory power capability, which is infinite.

(2) By using one's own pure-wisdom to transfer eight consciousnesses back to pure-wisdom, this may be called mental tool and it is a dynamic process of transformation.

(3) One can use own wisdom to directly observe and find one's noumo- / true-life, and not only observe one's physical pheno-life.

(4) The observing subjective researcher and the observed objective object (s) are actually and gradually unified as one unity (which is called enlightenment, cf. Chapter 9).

The characteristics of Western tools are:

(1) All tools are physical and there is without the concept of "mental tool".

(2) By using physical tools (instruments and equipments) to enhance one's resolving and sensory ability to make possible to observe some physical phenomena, these can not be seen by one's original resolving and sensory ability. The effect of this kind of physical enhancement is finite.

(3) There is no any equipment which can observe the pure-mind / true-life directly, and even the conscious / mental phenomena can only be observed firstly to transfer into physical phenomena by certain equipment, e.g. the brain wave.

(4) The observing subjective researcher and the observed objective object (s) can never be unified as one unity to enlighten the noumo-/ true-life.

Chapter 16 Comparisons of Eastern & Western Concepts of Laws, Theories & the Noumenon of Life

I. Introduction

In the last chapter, we have compared similarities and dissimilarities of research objects, and those research tools and methods of life, which exist in Eastern and Western biophilosophies. We now compare similarities and dissimilarities of Eastern and Western concepts of laws and theories of life. It is believe that some similarities exist.

When similarities are present, dissimilarities always simultaneously exist. Similarities are interesting, and dissimilarities are even more so. After our comparison, we will look for dissimilarities between Eastern and Western biophilosophies which complement each other, because natural laws and theories are very important in each.

Since the end of the 19th century, the Eastern world has learned many Western natural laws and theories. Eastern natural laws and theories, however, due to some different concepts are not as familiar to most Western scientists and philosophers. Therefore, we think that it is valuable to introduce some Eastern concepts, although they need further experiment, discussion and argument.

Whole some physicists have become interested in this issue. Our point of view, Eastern philosophical theories are basically biological, and it should be more interested to biologists and biophilosophers.

In comparing similarities and dissimilarities of Eastern and Western concepts of the noumenon and phenomenon of life, the first important thing to point out is that the relatively

unique concept of dialectic unified monism in Eastern biophilosophy, has no comparable Western concept.

In the Western paradigm, both monism and dualism are divided into two, and the former is further separated into Idealism and Materialism. Even in the application of dialectics, they are also separated into dialectic Idealism and dialectic Materialism, and not unified into one. This may be considered as a misuse of dialectics. As to Dualism, it is solely mechanically to add mind and material together. These three basic ideas have been argued since ancient Greece up to the present time.

Therefore, it may be said that this is the most basic and important biophilosophical difference between the East and the West:

(1) In the East, on the basis of the absolute noumenon, mind and material are dealt with as the two aspects of a unified whole unit. Their separation only has temporal and relative meaning, and they are merely the reciprocal different stages of the relative phenomenal dynamic expression process of the absolute noumenon.

(2) In the West, because there lacks the absolute conception of noumenon, thus Idealism or Materialism holds either mind or material to be seemingly absolutely true and Dualism holds both mind and material to be seemingly absolutely true. Even the Holism of the West is also of difference from the wholeness concept of the East, because the latter is built on the basis of the absolute noumenon but the former not.

II. Eastern and Western Concepts of Laws and Theories of Life

In the East, there is without a Western notion concerning the process of the development of a scientific truth, i.e. "hypothesis --- theory --- law". Instead of the Western concepts of "hypothesis" and "law", however, there are the concepts of "theory" and "truth". The Eastern concept of "truth" may be said to be equivalent to the Western concept of "law". We here "borrow" these two terms, hypothesis and law, to describe Eastern concepts.

1. Comparison of Eastern and Western Basic Laws of Life

1.1 Definition of Laws

In Eastern Buddhist tradition, there are three categories of books, called *tripitaka*, i.e. *sutra*, *vinaya*, and *sastra*. *Sutras* were expressed by Shakyamuni Buddha, and are truths taken as have been already proved, and thus may be thought of as like the Western concept of law. *Sastras* were written later by Bodhisattvas, in which some new concepts were explained and developed from the original *sutras* or integrated with other *sutras* and / or *sastras*. A *sastra* may be said to be equivalent to the Western concept of theory. The concept of *vinaya* is different from the Western concept of law, and it describes the discipline which helps in the practice of verification of truths.

In Buddhism, it may be said that there exists law(s), such as the law of cause and effect, even though originally it developed without the term "law". Therefore, the term "law" is introduced from the West. Buddhist basic law(s) are considered as radical and concrete rules, proven by Shakyamuni's practice. They also include rules which control things of the

pheno-world, and the rules which control the ways for reducing those to the absolute noumo-world. The purpose of reduction is to obtain enlightenment, spiritual evolution, and attainment of the highest position in the hierarchy of universal beings.

Concerning of the concepts of law both of the East and the West as basically the same, the general definition can be defined as follows:

The law is a truth which governs certain phenomena, both mental and physical, and has been proved by practice or experiments; this truth can always be repeated, that is to say, it is not only occasionally (it has no time limitation); it is also true everywhere and is not limited to certain places or spaces, that is to say, it must have universality (it has no space limitation).

1.2 Types of Laws

In the East, there is only one basic law, *the law of cause and effect*. It is considered as a general law, from which all other laws are deduced and they are actually sublaws. Therefore, it is thought that all universal phenomena, either mental or physical, are controlled by this law, and nothing is apart from it.

In the West, in natural sciences, there are different laws. In the field of physics, there are *the laws of Gravitation and Mechanics, Energy Conservation, Thermodynamics, Quantum Mechanics*; and in the field of genetics, there are *laws of Mendelian Inheritance, Genetic Code and Translation* . These laws can be further divided into sublaws. However, from the standpoint of Eastern concepts, these Western natural laws all belong to a category of sublaws of *the law of the cause and effect*, divided into different fields of natural sciences.

1.3 Dissimilarities between Eastern and Western Concepts of Laws

The dissimilarities between Eastern and Western concepts of laws are:

(1) Although the concepts of time and space in both Eastern and Western (especially that of Aristotle's) laws all include the past and future of the whole universe, in the East, the Buddhist universal concept of law is much more broader. This can be seen in the *Avatamsaka Sutra*, so-called the *Avatamsaka-world*, in which our solar-system seems merely as a smallest dust. However, the *Avatamsaka-world* itself is only one of the numberless worlds in the whole universe. The Western (especially the modern) concept of world / universe is of the origin, beginning, ending, and borderline which is still in expanding; but the Eastern Buddhist concept of the universe is beginningless, endless, and borderless, i.e. both time and space are infinite.

(2) The types of proof of Eastern laws are different, and not done by any physical instrument. They originated with Shakyamuni and his followers by physical bodily practice to enhance their wisdom and the resolving power of mind, which enable them to perceive the phenomena and truth of the past and future.

(3) Eastern concepts of law not only include the relative truths governing the physical world, but also include the absolute truth governing the mental world; and the greatest emphasis is on the latter.

These are similarities and dissimilarities between Eastern and Western concepts of laws. In general, the concept of Eastern law is relatively broader and emphasizes the mental domain more than in the West; therefore, the integration of both concepts of laws is valuable.

2. Comparison of Eastern and Western Basic Concepts of Theory

2.1 Definition and Concepts of Theory

2.1.1 The Western Definition and Concepts of Theory

The difference of theory between the East and West are somewhat bigger than that of law. In Western science, during the exploration of truths, there is a general developmental process. Starting from the original knowledge of truths, the first step is always to make a working hypothesis, which only preliminarily gives rise some speculations and possible experimental project. The second step, a very important key step, is to do experiments or further observation and research. According to the project, if some positive results can be obtained and the original hypothetical idea can be gradually got completely, repeatedly, and universally proved, then it can be realized as a law, e.g. Newton's physical laws and Mendel's genetic laws. However, if that idea can only be highly but tentatively corroborated, and can never be verified or confirmed, then it can only be realized as a theory, e.g. Einstein's theory of relativity and Darwin's theory of evolution.

Therefore, the establishment of a Western scientific law always needs to pass a very extensive testing and examination and to take a relatively long period of time. As to a theory, it is sometimes thought that its position is at an intermediate stage or a tentative situation between a hypothesis and a law, and its extent is relatively broader than a law.

2.1.2 The Eastern Definition and Concepts of Theory

Although there is without the Western concept of the developmental process from hypothesis through theory to law in the East, there exists the concept of theory developed by

Bodhisattvas as mentioned before. Without the concept of developmental process, it is because there is without the concept of hypothesis in the East. However, the Eastern concept of theory is not completely same as that of the West. There exist basically two categories of Eastern Buddhist theories.

(1) *The first category* is a collection of some individual truths or ways (approaches), which were expressed by Shakyamuni and had proved by him but not belong to basic rules or laws. These theories are for the purpose of being easy to follow and practice, and are called basic theories. However, this category of theories actually belongs to truths, and thus they are not well equivalent to the concept of Western theory.

(2) *The second category* is just like the *sastra*. However, *sastra* is actually one or many books, theory is a system of viewpoints which were developed and discussed within certain *sastra* or some books written by some later scholars. This category of theories is called synthesized theories.

3. Comparison of Some Eastern and Western Basic Theories of Life

According to the above descriptions, the first category of theories are not well equivalent to Western ones, so only that of the second category are compared with that of the West. They are shown in Table 33.

Table 33 Comparison of Some Eastern and Western Theories

East	West
1. Theory of the Integration of Cause and Effect	Theory of Special Creation
2. Theory of Karma-Force & Retribution of Life	Theory of Evolution
3. Theory of Wei-Consciousness	Theory of Preformation
4. Theory of Two-Fold Truths	Theory of Epigenesis
5. Theory of <i>Five-Skandhas</i> & <i>Twelve-Nidanas</i>	Theory of Mechanism / Reductionism
6. Theory of Six-Way Transmigration of Life	Theory of Organicism
7. Theory of <i>Nirvana</i> & <i>Bhutatahata</i>	

III. Comparisons of Eastern and Western Concepts of Noumenon

1. The Eastern Paradigm of the Noumenon of Life

1.1 The Basic Nature of the Noumenon of Life

In Buddhism, Taoism, or Confucianism, there is a concept of an absolute noumenon of life. Its name is different in each; namely: in Taoism, Tao; in Confucianism, Tao, Reason, or Natural-reasoning; and in Buddhism, Buddha-nature, Self-nature, *Dharmakaya*, *Bhutatahata*, *Nirvana*, Pure- / True-mind, Real-form, True-realm, emptiness, or nothingness. Because the noumenon is an absolute realm, any name is false or in error. Any name of noumenon is only a sign or symbol but not noumenon itself, which is apart from any language and transcendent of any concept or consciousness. In Buddhism, there is a great emphasis on the noumenon of life.

There are three quite similar notions in these Eastern biophilosophies: (1) This noumenon is the origin of both the universal things and life. (2) This noumenon is the original true-life which has been covered by contamination of ignorance, karma, non-humanity, or desire. (3) The value or final goal of human life is to recover this noumenon and return to original true-life. Once one recovers the true-life, one attains the greatest enjoyment and peace of mind.

In Buddhism, these notions are more prominent and emphasized. It has many different approaches of practice, which can be fit to the different natures of people.

The basis of this concept of noumenon is that it is the true origin of life and absolute in nature. True-life is a true-continuity, and it is without *samsara*, i.e. there is no-birth and no-death. The life that is in birth-and-death is not true-life, but only false-life, or physical-life / physical-body. The Eastern concept of life, especially Buddhist, is of two types: the True-life and the False-life. The latter has the phenomenon of birth-and-death while the former doesn't --- because it belongs to the noumenon.

1.2 The Characteristics of Eastern Paradigm of Life

In Eastern paradigm of life, the true-nature of life or true-life is continuous, without any disruption and alternation. In contrast, the phenomena of false-life or physical-life / physical-bodies are expressed in birth-and-death which occurs discontinuously during the three periods of time, i.e. past, present, and future. These will be further mentioned in the latter chapters. Thus, the Eastern paradigm of life can be characterized by the following eight notions.

(1) *The Continuity and Individuality of Life* means that each entity of life possesses its own historical continuous individuality, which is not only the product of its parents. The

parents are necessary conditions for birth, but without direct relationship between the parents and their children concerning their own life-entities. In other words, every life-entity in its self-nature is absolutely independent and possesses its own past, present, and future evolutionary history. Relationships between parents and children and that between sisters and brothers are only temporary conditions which was established in the past by actions of each individual.

(2) *The False-Life-Time-Chain* means that the phenomenal life-entity of each individual is transforming and transmigrating in its unique universal life patterns (see Table 15-2). This is the resultant or retribution of its karmas created by its own actions, both mental and physical, during each of its life-times. Therefore, according to Eastern paradigm of life, each life-entity is a long linkage of life-times of birth-and-death, in a long historical stream of an individual evolutionary process. In other words, the false-life is composed of numerous life-times, and one's present life-time is only a flash of one's long historical stream of life. False-life displays just like a long river or a movie, which seems in moving continuously but is actually discontinuous.

(3) *True-Life without Birth-and-Death* means that the phenomenon of this long linkage of the life-times of false-life is really a delusion, but only its individuality (i.e. true-nature) is rooted on and reflects true-life, the noumenon of life. In this sense, one can be enlightened that, from the standpoint of true-life or life noumenon, there is actually no-birth-and-no-death. Parents actually do not bear a new born, and thus no new life can be born, thus there is no life to end in death. Therefore, it is a secret of nature that the phenomenon of birth-and-death is only a delusion. This is said in the *Heart Sutra* (Shimano, 1978, tr., with some changes):

Sariputra, the emptiness of all things is of no birth, no death, no purity, no impurity, no increase, and also no decrease.

Here, emptiness means noumenon and is equivalent to the noumotype of life, noumo-life, or true-life. Thus, true-life and false-life may be called the noumotype of life or noumo-life and the phenotype of life or pheno-life, respectively.

(4) *The Cause of False-Life* means that the life which is expressed in birth-and-death as well as in transformation and transmigration in the delusive suffering world, is only false-life. The phenomenon of the transformation and transmigration is caused by ignorance and attachments, which occur in the daily practical life of the external natural and social pheno-world. In other words, the false-life phenomena of birth-and-death and of suffering are caused by misunderstanding the external pheno-world, misreading knowledge and information, leading to wrong ways in the conduct of life and erroneous evolutionary processes in the delusive realms of the universe.

(5) *Different Living-Beings with Different Life-Types* means that all living-beings can be divided into two categories: enlightened-beings and delusive-beings. Because there are big differences between these two categories in the expression of their life-types differences also appear. Only two life-types occur in delusive-beings, i.e. noumotype and phenotype, but three life-types (*rikaya*) occur in enlightened-beings. This means that, in enlightened-beings, besides the existence of noumotype (also called *Dharmakaya*), its phenotype is further divided into two subtypes, namely: the retribution-type (*Sambhogakaya*) and the metamorphosis-type (*Nirmanakaya*). These two subtypes of enlightened-beings are different from that of delusive-beings. First, although the retribution-type also belongs to its phenotype, it is perfectly harmonious with its noumotype without ignorance and attachment, such as that of delusive-beings. Next, the metamorphosis-type is incarnated by the willingness of enlightened-beings, and this motive is not in the power of delusive-beings.

(6) *Beginninglessness and Endlessness of Different Life-Types* means that the True-nature of life (noumotype) is beginningless and endless in time, and without boundary in space during its evolutionary process. However, its corresponding false-life (phenotype) is beginningless, periodically transforming and transmigrating, but is endedness once enlightenment occurs. Because sooner or later enlightenment will be achieved, therefore, false-life is not endless. If there were without enlightenment, then false-life would be endless.

(7) *The Reversibility of Life-Types* holds that because false-life or pheno-life is a movie-like fleeting delusion, it does not possess its own entity, or noumotype and shares the same noumenon with true-life. Fortunately, the delusion of true-life / -mind is reversible. Because of this, the possibility exists for all sentient-beings to reach enlightenment and recover the original true-life / -mind. Once enlightened, one will never delude and reverse back. Thus, this reversibility succeeds only once.

From the standpoint of delusive sentient-beings, enlightenment means reduction, reducing from delusion to enlightenment. In this sense, Buddhism in its essence was an early Eastern paradigm of Reductionism. False-life is, therefore, rooted on true-life, and can not be independent of it. Though delusive-beings are deluded, they still have the potential to be enlightened. When one's false-life is reduced to true-life, one attains enlightenment and becomes an enlightener. The nature gives equal potentiality to every one to reverse one's delusion and gain enlightenment.

(8) *The Emptiness-Meaning of Entity* is the Eastern concept of "entity", meaning formlessness, nothingness, emptiness, absoluteness, *bhutatathata*, or other names beyond in time and space. In other words, entity is eternal and unchangeable. If there is something with form and shape, it must have a history of arising, developing, abiding, aging, and decaying, namely, it is changeable and impermanent. Anything with these phenomena is only a false-

entity. In this way of understanding, the meaning of entity is the same with the Eastern paradigm of life-entity or true-life. However, Western concept considers entity to be some kind of material with form and shape, or at least some kind of matter with time and space to exist. This is a big difference between Eastern and Western concepts of “entity”.

2. The Western Paradigm of the Noumenon of Life

2.1 The Theory of *Eidos* and *logos* of Socrates and Plato

In Western biophilosophy, there lacks a clear distinction of notions of noumotype and phenotype of life, although there is a clear distinction of notions of genotype and phenotype of individual or species in the field of genetics. In other words, there is without a clear notion of the absolute and omnipotent noumenon of life. Thus, the concept of the nature of life is restricted to the level of the material and not expanded to consider the supermaterial or that which is beyond material.

It is considered that the noumenal concept of Socrates' and Plato's “*eidos*” seems somewhat similar to Eastern absolute and omnipotent noumenal concept of “*bhutatahata*”. However, the latter is true absoluteness, oneness and emptiness / nothingness without any idea existed, but the former still exists ideas and numbers which are only in abstract situations. Therefore, the noumenal concept of *eidos*, in comparison with that of *bhutatahata*, may be appropriately to say that it belongs to abstractness but not absoluteness and oneness. Furthermore, the *bhutatahata* can be directly proved or experienced by practical intuitive formless observation methods. However, there is no appropriate efficient practical methods to directly prove or experience the *eidos*.

Because of this, there is no way to directly verify or experience the actual state of *eidos*, and hence there is also no actual criterion to realize and identify its true existence. However, Plato supposedly realized it in two ways: (1) it might exist transcendently in a rational world opposite to things in a real sensational world, and (2) it might exist at least relatively separate from or metheksis, i.e. participation with real things (Chen, 1990, pp.210-221). Thus, Plato's *eidos* becomes unreal ideas or separate relative complex-ideas (ibid, p.186). Therefore, these ideas are apart from the concept of *bhutatathata*, and may be somewhat equivalent to the realm of Buddhist eighth consciousness (see Chapters 5 & 7).

2.2 The Theory of *Dynamis*, *Energeia* and *Entelecheia* of Aristotle

In Aristotle's Vitalism, although there are concepts of soul, *entelecheia*, *dynamis*, *energeia*, *psyche*, *pneuma*, *ousia*, and *logos*, they were not endowed with a clear notion of the noumenon of life. There was no sense of its origin and its fate after the death of the physical body. These basic problems are still obscure and unsolved.

According to Aristotle, the offspring's soul originates from and is transferred by its parents, mainly by the male (semen). Thus, the offspring's soul is only a "separate-piece" of its father's soul. In this sense, all the souls of present animals and human beings are only individual "separate-pieces", which are all originated from one "first father" on the earth. All of these souls are actually just piece of the general soul of the whole population of present animals and human beings on the earth. Consequently, each individual in this population possesses commonality and no individuality. Each individual soul starts with its fertilization and ends at death. Individually, there was no past before birth, and there will be no future after death.

Modern biological concepts are the same as that of Aristotle, although Aristotle's idea of soul is no longer present.

However, according to Buddhism, every soul, mind, life or self-nature of each being is an entity, possessing its own independent individuality. This kind of individuality is a real continuity. The relationship between offspring and parents is only in causality, which was established by each of them during the past. The soul of offspring and that of parents are totally independent from each other. The former does not come from the later. Parents are only the necessary conditions for the birth of offspring. Thus, what is undergone in the present was created by each individual itself during its past, and what will be undergone in the future is created further by each individual itself during the present.

3 The Comparison of the Ideas of *Pneuma* and Chi, *Eidos* and Mind

Aristotle's idea of *pneuma* is related to the Taoism idea of *chi*. However, *chi* exists not only in the human body, the animal body, and the plant body, but also in non-living things, existing everywhere and filling in whole universe.

One wonders if Aristotle knew and practiced anything similar to the Chinese *chi-gong* or breathing exercises. It is curious why he used the word *pneuma* (breath) and defined it as "hot air". Is it coincidental that when one practices *chi-gong* breathing exercises, one gets hot feelings in one's body?

Furthermore, according to Singer, in Aristotle's time the meaning of the word soul (*psyche*) also meant breath. Singer said (1950):

Now the word *psyche* had a long and adventurous history before Aristotle came to use it. The oldest Greek work we have is the poem known as the *Iliad* of Homer, which deals with the siege of the city of Troy by the Greeks. Parts of this poem date from about 1050 B.C. and therefore nearly 700 years before Aristotle.....In the *Iliad* of Homer we find the word *psyche* often used in the sense of *breath*.....So from *breath* the word *psyche* came to mean *life*, then the *principle of life*, and the *soul* or again the *mind* (op. cit., p.15; also see *The Iliad of Homer*, R. Lattimore, tr., 1952).

Therefore, in ancient Greece, perhaps there might have been some kind of breathing exercise methods, which bring one in feeling with *chi*. This problem may be worthy of further research. It could be held that Aristotle's *Theory of Soul* and *Theory of Pneuma*, and the ideas of *psyche*, *pneuma*, *dynamis*, *entelecheia*, and *energeia* could have come from his realization in breathing-exercise practice.

Aristotle attempted to build a bridge, by using his ideas of *dynamis*, *energeia* and *entelecheia*, to connect Socrates' and Plato's transcendental idea of *eidos* from the rational world to the real world. In certain extent, he succeeded and built up his bridge --- Vitalism. Therefore, Driesch and Singer thought that Aristotle's Vitalism was pure and full. However, there still exist some problems. The first is concerning the mind problem.

Let us look at what Preus (1975, p.83) said:

Aristotle's 'most vexed' problem concerns the rational power of the soul, mind (*nous*). It may be that this problem motivates the exhaustive account of the possibilities of the sources of the faculties, for at 736b 5-8 Aristotle has said that his biggest problem is 'how and when and whence' mind arises in those that have it. This problem arises largely because there is serious question whether mind has any share in physical nature, that is, in matter.

From this, it can be seen that Aristotle's mind, like other five senses, is only one of the faculties of the soul and arises from it. Thus, Aristotle's concept of mind is not basic agency of life. The relationship between the mind and body still leaves open. As Preus said, this is the biggest problem with Aristotle's *Theory of Soul*, and his Vitalism. Other problems are: What is the origin of the soul? What is the fate of the soul after the death of a living being? Is there the individuality and continuity of the soul? It is considered that all these problems can be solved by integration and complement with Eastern ideas, especially the Buddhist.

In Buddhism, there is the 6th consciousness, and also the 7th, the 8th; and more importantly, the pure mind. The absence of this is what is unsatisfactory in Aristotle's theory.

However, Aristotle's idea of four elements is very similar to that of the Buddhist four elements.

Let us look at what Aristotle said:

Fire, air, water, earth, we assert, come-to-be from one another, and each of them exists potentially in each, as all things do that can be resolved into a common and ultimate substance (*Meteorology*, I. 1, 339a 37-339b 2. tr., Webster; Barnes, 1984, p.556).

In general, the most basic difference, between the Eastern concept of noumenon and phenomenon and that of Socrates and Plato, is that the latter mechanically separates the noumenon and phenomenon of things as independently two absolute different realms and can not meet together. However, the former deals with the noumenon and phenomenon of life and things as a whole or as the two sides of a hand. These two sides connect and integrate, penetrate and unite together. The existence of one depends on the other; and these two existences can not be separated each other. They are dialectically united together in perfect harmony. This Eastern concept developed and attained to very high level in the theory of *dharmadhatu* conditioned-arising of the Hua-Yen Buddhist school, and the theory of the three-type-truths of the T'ien-Tai school.

Therefore, it is believed that these unsolved problems in Western philosophy /biophilosophy can be solved by integration and complement with Eastern theories / ideas. It may be possible that the ideas of Socrates' and Plato's *eidos*, Aristotle's *pneuma* and the four elements are bridges, which can connect with Eastern notions.

Chapter 17 Bio-Meanism: A Dialectic Unified Monism of Life

I. Introduction and Definition

In the last three chapters, a series of issues between Eastern and Western biophilosophical theories were compared, including: research objects, tools, and methods; concepts of laws and theories; and essential ideas of noumenon and phenomenon of life. After these comparisons, it appears that the most important key problems are different concepts of the noumenon / ontology of life between these different biophilosophical theories. It is now to try to discuss this kind of issue.

This study holds that the most important characteristic of Eastern biophilosophy is the concept of absolute noumenon, the *dharmakaya* / *bhutatathata* or Wu-Ji / self-nature, a concept lacking in the West. From the Buddhist point of view, this concept is necessary to complement Western biophilosophical concept, the phenomenology of life, especially as developed in modern biology.

Therefore, from the view of integrating and complementing the Eastern and Western basic biophilosophical concepts, a somewhat new definition of life and a dialectic-unified-monism or monistic-system of life are suggested here. These are established on the basis of the concept of wholeness and for the unification of the noumo-life / -mind and the pheno-life / -mind.

A somewhat new definition of life is first given rise as follows.

Life is a unified field system of three basic elements / types: life-force, life-energy, and life-material, which are self-potentialized and in a state of discontinuity-transformation; however, life-discontinuity is only a temporal / relative phenomenon based on the continuity of life which is an eternal / absolute noumenon. Thus, life is a wholeness / unification of noumenon / phenomenon and a continuity / discontinuity of the different hierarchies of the "three basic life-elements / types.

None of these three basic life-elements / types can be separately and independently dealt with as a complete concept of life; and neither Vitalism nor Reductionism or Organicism can also be considered as a complete biophilosophical theory.

II. Some New Concepts of Life

1. New Concepts of Noumo- and Pheno-Life

The concept of noumo-life is the nature / noumenon of life, and can be called the noumotype of life. It belongs life ontology and may also be called a statics of life or life-statics.

The ontology of life is composed of three components: (1) the nature or characteristic of the noumenon of life, i. e. noumo-life / true-mind; (2) the concepts of life-force; and (3) the deduction of *the law of the conservation of energy*, i.e. *the law of the conservation of life-force*. It also concerns a unification of pairs of essential contradictions, such as potentiality and actuality, absoluteness and relativeness, stillness and activeness, power-force and energy-utilization, continuity and discontinuity, and with-discriminating-ability and without-discriminating-ability.

The concept of pheno-life is defined as the phenomenal expression of noumo-life in different hierarchical forms / types, ranging from different energetic wave-lengths of wave-forms to different levels of physical-forms. Pheno-life can be also called phenotype of life or life-phenotype, and it is the phenomenology of life. It is also the dynamics of life, so may be called life-dynamics, which manifests the potentiality / functions of noumo-life / true-mind.

The phenomenology of life is composed of all the phenomenal issues of the animate world, but basically can be also summarized as three components: (1) two of the three life-elements, i.e. life-energy and life-material, (2) the ontogeny and phylogeny of life, (3) *the law of cause and effect* and also the deduction of *the law of the conservation of energy*, i.e. *the law of the conservation of life-energy*.

The general characteristic of the dialectic approach either that of Fushi, Shakyamuni, or Aristotle, is the dichotomic division. In this view, although the present life definition includes three-life elements, they are still the results of dichotomic division from a holistic life, and pertains to three different hierarchies. This can be shown in Fig.58.

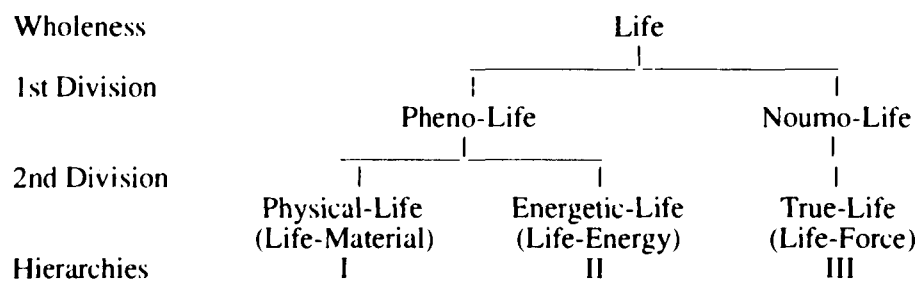


Fig. 58 The Division of Two Life Categories, Three-Elements / -Hierarchies of Life

Noumo- / True-life pertains to an absolute domain, so it is unable to be divided. From the Buddhist view, Western biophilosophy lacks the Eastern concept of noumo-life or noumenology / ontology of life, the former concept needs to be complemented by the latter. In

vice versa, Eastern concepts could be also complemented by the Western modern concept of the phenomenology of life.

By integration and complement of both Eastern and Western notions, the concepts of noumo-life / true-life and pheno-life / false-life may be expressed as the following formulas.

(1) *Noumo- / True-Life Formula*: Noumo- / true-life is in the enlightened state, and may be expressed as the function of absoluteness, emptiness, nothingness, omnipotentiality, or infinite power. It may be shown as the formula:

$$\text{Noumo- / True-Life} = f (0)$$

Where *f* means function, 0 means, absoluteness, emptiness, nothingness, omnipotentiality, or infinite power.

(2) *Pheno- / False-Life Formula*: The pheno- / false-life is in the delusory state, and may be expressed as the function of time, space and karma-forces. It may be shown as the formula of:

$$\text{Pheno- / False-Life} = f (T, S, K)$$

Where *f* means function, *T* means time, *S* means space, and *K* means karma-forces.

2. A New Hierarchical System of Pheno-Life and Life- / Mind-Fields

On the basis of the concept of the noumo- / true-life, two other concepts of the hierarchical systems of the pheno- / false-mind and life- / mind-fields may be correspondingly proposed, and are discussed separately as follows.

2.1 The Hierarchical System of the Structure of Pheno-Mind

According to the Buddhist theory of wei-consciousness, the pheno- / false-mind is composed of not only the subjective but also the objective components. The subjective and objective worlds are all differentiated from the 8th-consciousness and only have relative and temporal meaning. One should not attach on and fix them. This is the dialectic and holistic Eastern concepts of mind. These concepts of mind can be configured and divided into three hierarchies as shown in Fig.59.

beginningless and endless life-stream, and is without the acts of birth and death but only changes its form of expression during different life-transmigration stages.

(3) Each consciousness dichotomically divides into two divisions: subjective (sub.) and objective (obj.), which represent two components of the different levels of a life-entity / life-wholeness. The subjective division possesses the discriminative and thinking abilities, but the objective does not.

(4) The 8th-consciousness exists everywhere in the universe and without any borderline in space and time. All other consciousnesses, both subjective and objective divisions, exist in the objective-division of the 8th-consciousness.

(5) All other seven consciousnesses are redifferentiated / retransformed from the 8th-consciousness during different life-times.

Due to the structure of mind in Western both biology and psychology, there is neither the concept of the true- / pure-mind nor that of the 7th- and 8th-consciousnesses. Therefore, it is valuable to integrate and complement Eastern with Western concepts of mind.

Fig.60 shows the hierarchical structural system of mind by integrations and syntheses both Eastern and Western as well as Buddhist and Confucian concepts of mind.

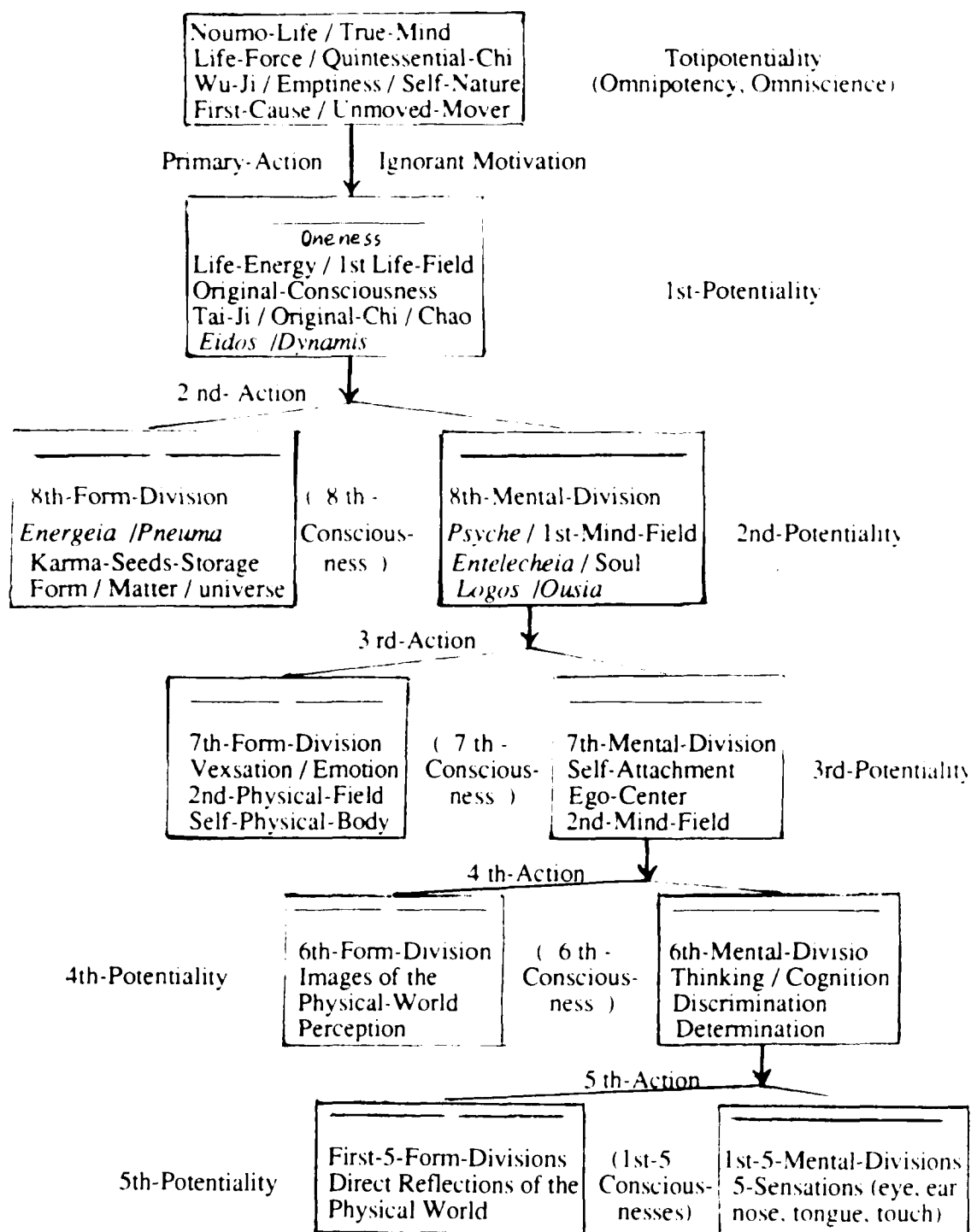
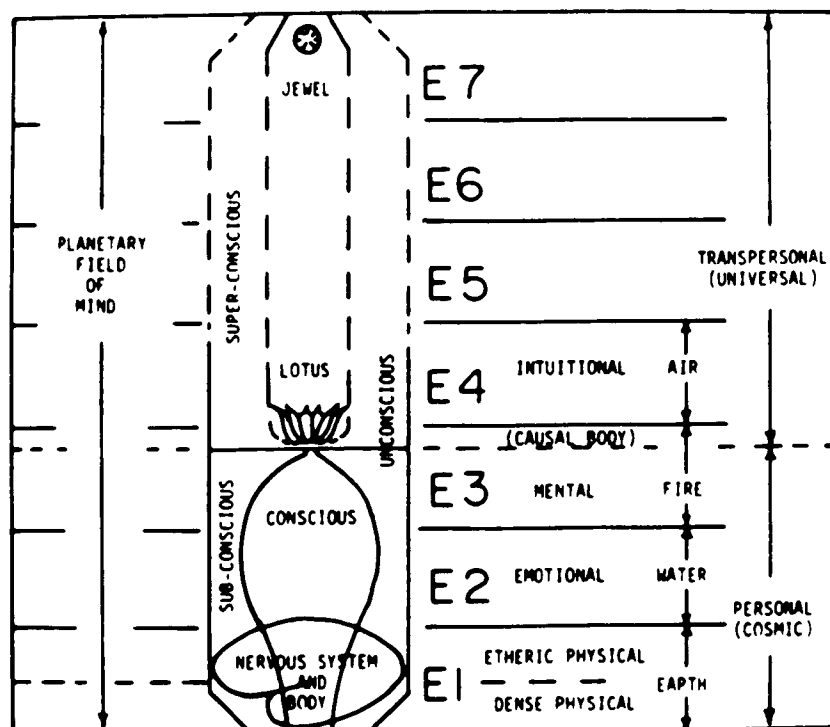


Fig. 60 Syntheses of Both Eastern / Western and Buddhist / Confucian Concepts of Mind

2.2 The Hierarchical System of Life- / Mind-Fields

On the bases of the psychological systems of Freud and Jung, Green (1977 / 1989) sketched a system of seven levels (E 1 to E 7) of planetary field of mind. However, basically it is also divided into three hierarchies (conscious, subconscious, and super-conscious) and two categories, i.e. personal (cosmic) and transpersonal (universal), shown in Fig.61.



Symbolic interpretation of human substance and perceptual structure. Each line of the vertical cylindrical figure, which represents a human being, stands for at least three things: a boundary between different organizations of substance (different kinds of matter), a boundary between different kinds of possible perception, and a boundary between different kinds of possible action.

Fig. 61 Green's Hierarchical System of the Planetary Field of Mind (after Green, 1989, p.301)

Green's system is mainly sketched in vertical and connected with the concept of the Tibetan Buddhist Esoteric school (Evans-Wentz, 1957; Green, 1989, p.301). A multiple-dimensional system of pheno-life / -mind fields are mainly proposed on the basis of the wei-consciousness or *vijnanavada* school (Cai, 1990, 1992). It is held that the existences of all the pheno- / false-minds or consciousnesses may be only different levels of the karma-force / energy-wavelength of fields, which can be called a hierarchical system of pheno-life / mind-fields, shown in Fig.62.

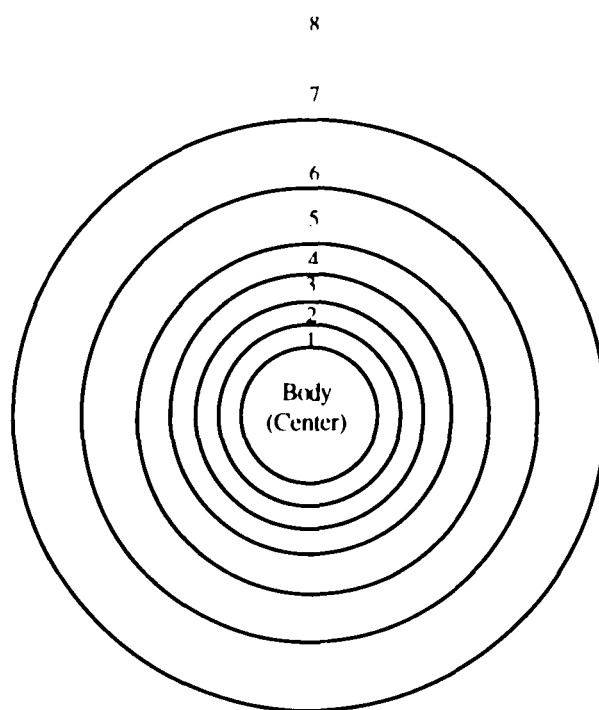


Fig. 62 Hierarchical System of Pheno-Life / Mind-Fields
 (1) Body-cons.---touching; (2) Tongue-cons. ---tasting;
 (3) Nose-cons. ---smelling; (4) Ear-cons. --- hearing; (5) Eye-cons. --- seeing;
 (6) 6th-cons. --- thinking; (7) 7th-cons. --- egoing; (8) 8th-cons.--- root of all
 cons. & karma-seed-information storage, infinite without any boundary.

This is the expression of pheno-life / -mind in different types of fields, which are the differentiations of the structures and functions of the pure / true-mind. According to the distance of the feeling effect, from the smallest to the largest (infinite), the sequence of pheno- / false-mind (consciousness, represented by cons.) is that of: body / touching, tongue / tasting, nose / smelling, ear / hearing, eye / sight, the 6th / mind, the 7th / ego, and the 8th / root-storage. The feeling-effect distances of the 6th-, 7th-, and 8th-consciousnesses can be infinite, especially the 8th, due to its existence actually in the whole universe.

Although the images of things are actually on one's eye-retinas, one always sees things in the external world but not in one's retina. This is because one's consciousness / sensation is actually in a form of field. It reacts with sensible objects outside the body, so that one feels a certain kind of thing existing over there. One's sense-organs and central nervous system are only the system of a reaction center, i.e. the center of life- / mind-fields. If one's consciousnesses / sensations were not fields and could not directly react with the objective things outside of the body, then one could not feel them existing outside but could only sense them as existing inside of the body.

III. Bio-Meanism: A Dialectic-Unified-Monism of Life

In this study, it is attempted to connect the mind, physical body, and matter three things together, and demonstrate that they possess the same noumenon, i.e. noumo-life or true-mind. On this basis, using the approach of dichotomic dialectics, a dialectic-unified-monistic system of life is established.

It is demonstrated that automatic- / dynamic-force, and the specific discriminating function of the true-mind / true-life make distinctions. No other universal things possess these capability, and this is the unique function of the mind, both the true-mind (which maintains totipotentiality) and the false-mind (different beings lost or covered different degrees of functions). This study holds that Vitalism, Organicism, Reductionism, Functionalism, and even Holism are all only incomplete understandings of the true-nature of life. Therefore, it is helpful and necessary to try to synthesize the valuable parts of all biophilosophical theories. It is the aim of the dialectic-unified-monistic system of life, to synthesize them into a coherent whole.

I. Definition

This system is called Bio-Meanism, a neo-Holism, or Dialectic-Unified-Monism. It unifies the three life elements, life-force, life-energy, and life-material (or in other words, the true-mind / Shen, Chi, and physical body / Jing), and it is the wholeness of noumo- / pheno-life. It also demonstrates that these elements possess the same noumenon, i.e. noumo-life or true-life / -mind; and that it is established by using the approach of dichotomic dialectics.

The term “Meanism” is introduced from Confucianism, and its meaning is also from the Buddhist Sanskrit term “*madhya* ”. Here, the Bio-Meanism can be defined as follows.

Bio-Meanism or neo-Holism or Dialectic-Unified-Monism is an approach, which deals with three basic life-elements / types, life-force, life-energy, and life-material, or the true-mind (Shen), false-mind (Chi), and physical-body (Jing). They are conceived of as a whole, in which all are dependent each other. Life-energy (false-mind, Chi) and life-material (physical-body, Jing) are only different expressive features during the different developmental stages of karma-force, transformed from life-force, in continuous (ontologically) and discontinuous (phenologically) transformation processes.

2. Relationships among Three Life-Elements

According to the Bio-Meanism, the relationships among the three life-elements, i.e. life-force, life-energy and life-material; or among the true-mind (noumo-life / Shen), false-mind (pheno-life / Chi), and matter / material (physical-body, Jing); or among the Bio-Meanism, Vitalism, Reductionism / Mechanism / Materialism, and Organicism, can be shown in Fig.63.

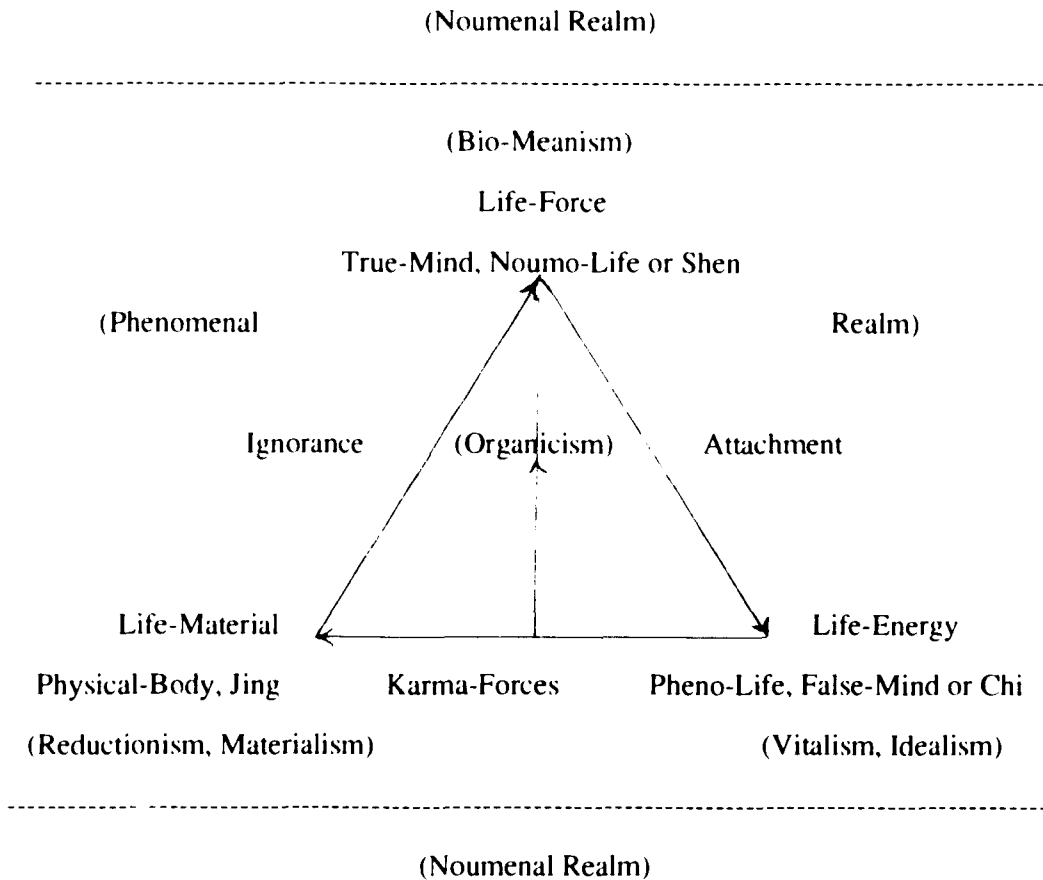


Fig. 63 Diagram of Bio-Meanism: A Dialectical-Unified-Monistic System of Life

In Fig.63, there are three points to be noted as follows.

(1) The true-mind (or Shen, noumo-life, life-force) is the origin of both life and the universe. It is an automatic-, dynamic-, natural-objective-existence and multi-functional-force,

and possesses totipotentiality, especially the unique capacity of discriminating function which makes discriminations. No other universal things possess such a capability.

(2) The true-mind maintains totipotentiality but the false-mind has its functions covered in different degrees in different living-beings due to their ignorance of the false (relative / conditional / temporal) nature of material (physical-world / -body) and their attachment to it.

(3) By the ignorance of and attachment to the physical-world /-body, the true-mind / life-force is first transformed / differentiated into the false-mind / life-energy, which is again transformed into karma-force (narrow sense) or universal-energy, including bio-energy (subjective) and physical-energy (objective).

(4) The objective physical-energy and the subjective bio-energy are further transformed / aggregated into inorganic and organic / life materials, respectively and sequentially, through a long time of objective natural development under a combination of suitable conditions by the control of the natural law of cause and effect.

(5) The state of ignorance is the origin of the phenomena of birth-death- universe /-life, and also of natural-objective-existence, which is beginningless as the same as true-mind. The true-mind is endless, unannihilated and eternal, and ignorance is finite because it does not possess a noumenal entity. Thus, ignorance and its product, attachment, can be annihilated by the wisdom of true-mind; and both false-mind and material can revert to true-mind. Due to such reversibility, one can become enlightened; and this reversion process is called enlightenment or awakening.

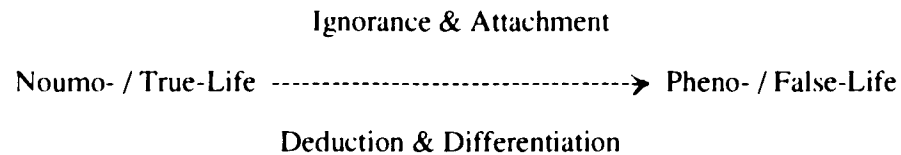
Therefore, One should deal with three life-elements, the true-mind (or life-force, Shen), false-mind (or life-energy, Chi), and material (or life-material, Jing), as a whole. On this basis,

one can not consider that Vitalism, Organicism, Reductionism, Functionalism, and Holism (old) demonstrate the true-nature of life.

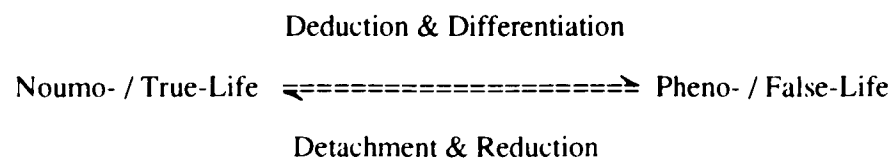
3. Relationships between Two Life Categories

From the view of Bio-Meanism and the relationships between noumo- / true-life and pheno- / false-life, the state of delusion or enlightenment may be expressed as the following equations.

(1) *Delusory- / Dynamic-Non-equilibrium-Equation*: The state of delusion may be considered as the relationship between noumo- / true-life and pheno- / false-life being in the non-equilibrium situation, and the equation is as follows:



(2) *Enlightened- / Dynamic-Equilibrium-Equation*: The state of enlightenment may be considered as the relationship between noumo- / true-life and pheno- / false-life being in the equilibrium situation, and the equation is as follows:



The processes of the detachment of ignorance and the reduction of noumo- / true-life or pure- / true-mind can use a various life-reduction practice approaches .

The relationships in above two equations can be further diagrammatically expressed as in Figs.64 & 65.

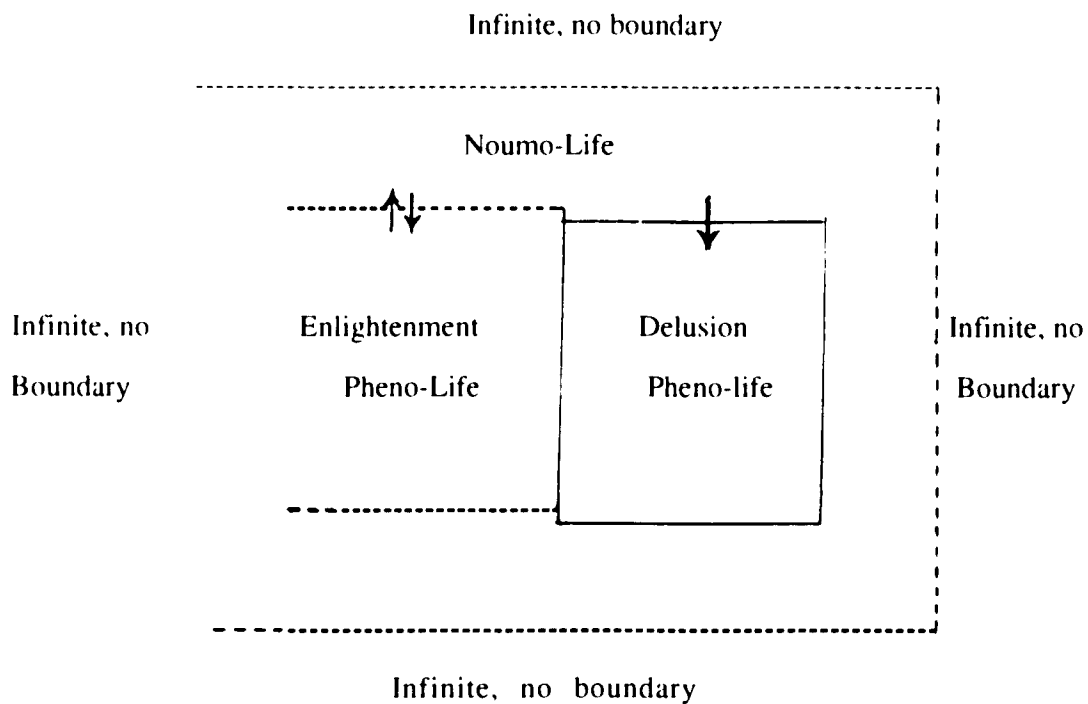


Fig. 64 Relationships between Noumo- / Pheno-Life and Enlightenment / Delusion

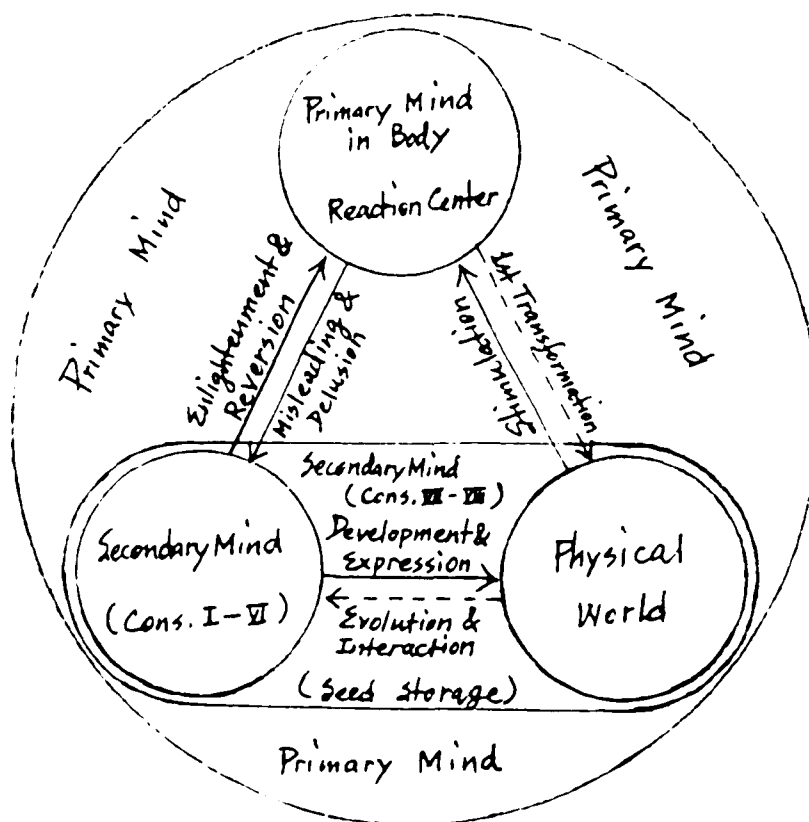


Fig. 65 Relationships among Mind, Body, Universe and Enlightenment or Delusion

Figs. 64 and 65 demonstrates: (1) pheno-life is rooted on noumo-life; (2) whether enlightenment or delusion shares the same noumenon; (3) delusion means the relationship between noumo- and pheno-life being in non-equilibrium / unbalanced situation, and enlightenment means the relationship between noumo- and pheno-life being in equilibrium / balanced situation; (4) in delusory situation there is a barrier with its noumenon caused by ignorance and attachments, and in enlightened situation without.

Chapter 18 New Concept of Ontogeny (1): Bio-Determinism

I. Introduction and Definition

According to the definition of life proposed in the last chapter, which pertain to the statics of life, or life-statics of the noumology of biophilosophy, the dynamics of life or life-dynamics, which concerns the phenomenology of biophilosophy, will be discussed in this and next two chapters. This includes the different types or patterns of expression, differentiation, and transformation of noumo-life / true-mind into pheno-life and pheno-world (the universe). The noumology or statics of life is the theoretical basis of the present study, and is used to suggest new explanations of the ontogeny of both individual development (called Bio-Determinism) and inheritance (called neo-Geneticism) and the phylogeny of evolution (called neo-Evolutionism).

According to the new definition of life, if one only views it phenotypically from the point of three life-times (past, present and future), life looks like discontinuous (one may also say that it is continuous, but it can be said at most as pseudo-continuous). If one views it noumotypically from the point of oneness, nothingness, *nirvana*, *bhutatathata*, pure-mind, or life-force, life is truly continuous. Thus, from both viewpoints of the two life-types (pheno- and noumo-life) and the three life-times, life is actually a dialectic unification of both continuity and discontinuity. If there is no noumo-life, the pheno-life can not exist; and if there is no pheno-life, the noumo-life can not express its functions. Two life-types exist dependently.

However, the pheno-life and noumo-life as well as continuity and discontinuity are seemingly contradictory. This is called a dialectic unification of two contradictory aspects.

Therefore, in general to say, life is a continuum, like a stream or link. According to the dialectic-unified-monistic system, life-energy /-field is a pool of power, energy or karma-force and the hierarchy of the eight consciousnesses. It is a storehouse of life-seeds */bijas* or a spring of life-information.

This chapter first deals with the ontogenesis of individual development, taking just one link, the present life-time, out of a long life-chain, to show how the life-seeds */bijas* or life-information manifesting into both mental activities and physical morphogenetic characters.

It is now that the definition of Bio-Determinism or neo-Determinism (Bio- / neo-Determinism) can be defined as following points:

(1) Life is a continuum in continuous transformation from a energetic, semi-material, potentialized, or negative / death-form to another physical, material-actualized, or positive / living-form, with the border-line of birth and death. Thus, life is nothing else, but the reciprocal transformation of these two forms.

(2) There is no true-birth, only phenotypical birth, and there is also no true-death, only phenotypical death.

(3) The characteristics of each form is predetermined reciprocally, namely, the positive determines the negative, in turn, the negative also determines the positive. From this point of view, life is nothing else, but the ontogenetic circulation of positive and negative two forms.

(4) The action of the predetermination of the former form is only a recessive potentiality, which needs to pass an ontogenetic development to actualize and transform into the next actualized form; thus, during the process of predetermination of the next form, it is simultaneously also in the process of actualization or epigenesis of the present form.

This is a fully dialectic process and can be shown in Fig.66.

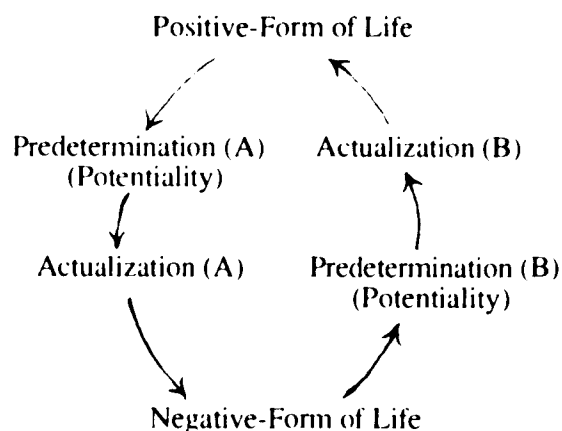


Fig. 66 Dialectic Relationship between Two Ontogenetic Life-forms

(5) The cause of predetermination comes from one's own activities, which transforms one's life-energy into karma-force /-seeds /-*bijas*, or from seeds /*bijas* into physical forms, but not from any superpower or special purpose.

Thus, the Bio-/ neo-Determinism is not special teleological.

In the above discussion, only delusive-life is concerned; and the ontogenetic-circulation only pertains the small circulation in life-continuum or life-chain, and the big circulation, the phylogenetic circulation, will be discussed in the next chapter. From this view, Bio / neo-Determinism considers the ontogenesis of individual development in following two senses.

(1) The life-energy /-field, in the type of the power of the 8th-consciousness, enters into and combines with fertilized egg. There are two types of life-seeds /*bijas* stored in the 8th-

consciousness: one concerning mental or consciousness development and the other physical. The mental-matured-seeds / *bijas* first redifferentiate the 7th-consciousness, then the 6th, and the first five, subsequently.

(2) The physical-matured-seeds / *bijas*, in the meantime, redifferentiate the six sense-organs to be the physical-roots of the first six consciousnesses and the egocentric-organs (i.e. the inner-organs, such as, the heart, the lung, the stomach, etc.). The physical-roots of the 7th are also manifested orderly with their characteristics according to the information carried in seeds / *bijas*.

In contrast to past life-times, because all differentiations in the present life-time are in the category of redifferentiation, later on, they are just called differentiation. In the process of ontogenesis, there are five essential problems: (1) How does life-energy enter the egg (fertilization) and start ontogenesis ? (2) How does life-energy operate and regulate ontogenesis, i.e. development, differentiation and morphogenesis ? (3) How does life-energy act within the body and interact with circumstances, the karma-expression and new karma-creation ? (4) How does the life-energy finally leave the physical body, at death ? (5) Is the form, shape, or type of pheno-life preformational or epigenetical and teleological ?

All of these problems are in historical controversy. In the view of this study, they seem to be able to solve, at least partly, if they are explained in complement with Eastern concepts.

II. Three-Hierarchy Theory & Two Western Developmental Theories

1. Two Life-Forms and Three Life-Hierarchies

The definition of life proposed in this study is a broad concept. It is based on three life-elements: life-force, life-energy, and life-matter. From the viewpoint of ontogenesis, i.e. the development and morphogenesis of delusive pheno-life, it has been pointed out above that there exist two types of life, the positive and the negative. However, if the concept of life includes noumotype, it can also be said that there exist three types or hierarchies of life-forms. These are: (1) with shape and rough mass, i.e. physical-life, (2) with wave and fine mass, i.e. energetic-life, and (3) without any shape and form, i.e. pure-force-life. They are defined briefly as follows.

(1) *Life-Form with Shape and Rough Mass* applies to life with physical body and all kinds of shapes and forms. It is equivalent to life-matter, the Jing in Taoism and Confucianism, or the six-roots in Buddhism. In the ancient East, there was much research in this aspect, especially in China connected with medicine. However, there was almost no development in the East, after the middle, compared with Western progress of modern biological and medical sciences, especially molecular biology. The biological sciences of the latter mainly take this type of life-form as their research objects. These may be called phenobiology.

(2) *Life-Form with Wave and Mass* is about life without body material or other kinds of physical shape and form, and pertains to wave-forms and some kinds of fine mass particles. It is a concept equivalent to that of energetic-life, or Chi (Qi)-body as in Taoism and

Confucianism, or the *antara-bhava* (the intermediate existence between death and rebirth, i.e. the 8th-consciousness) in Buddhism.

In the East and West, especially the former, during ancient times, there was much research on this type. However, it is a concept denied by modern biology. Because of the great attention and emphases paid to bodily-life, less knowledge is known concerning this supra-type of life-form.

Nevertheless, due to recent progress both in quantum physics and transpersonal psychology since 1980, knowledges concerning this type of life-form have increased very rapidly in this field in the West (Davies, 1984, 1985; Dienstfrey, 1991; von Franz, 1987; Gardner, 1991; Green, et al., 1989; Grof, 1985; Harman, et al., 1984; Hooper, et al., 1986; Levine, 1987; Peat, 1988, 1991; Penrose, 1991; Rusker, 1982; Scott, 1991; Talbot, 1988; Tart, 1991; Watson, 1988; White, 1990; Zohar, 1990). However, it is also necessary to develop a new branch of biology to further investigate this type of life-form.

This new type of biological thinking may be called metabiology.

(3) *Life-Form without Any Shape and Form* is concerning life without any form. It is the absolute real-form and contains totipotentiality, omniscience and pure-wisdom. It is equivalent to life-force, or Shen in Taoism and Confucianism; or *dharmakaya* / *bhutatathata* / self-nature in Buddhism. It is the origin of life-power and the original true-feature of life. In the East, this type of life-form has been considered very deeply and many approaches have been developed to experience it. However, no corresponding concept and approach to experience it exists in the West. In the near future, it is hoped that Eastern and Western biophilosophies will be integrated and complemented and a more comprehensive biology will be developed. It is fortunate that recent developments in transpersonal psychology also touch on this type of life-form. It will be understood in more depth, gradually through appropriate approaches of practice.

One thing to point out is that these three types of life-form are only for relative and temporary discussions, and are different hierarchies of ontogenetic developmental and phylogenetic evolutionary processes. From an enlightened state, three hierarchies are actually seen as one. Only in delusive condition, three types / hierarchies of life-forms are distinguished, and this is caused by the hindrances of mental adhesions and barriers.

Although there are three relative types / hierarchies of life-forms, they actually exist as a whole. This is the basic concept of dialectic-unified-monism / -monistic-system of life. According to this system, it is necessary to develop some new approaches to investigate this third type of life-form. This will be a new branch of biology, which might be called noumobiology.

2. Preformationism, Epigenesism or Teleology ?

It is one of the riddles of life: why can a fertilized egg start its cleavage and follow a series of continuous cell division, differentiation or morphogenesis, and finally form an individual, which possesses all genetic characters of its certain specific characteristics ?

According to Gilbert (1988, p. 247):

Any explanation of the differentiation of the various bodily cells from the fertilized egg has to explain (1) the constant morphology of each species (i.e. that chickens beget only chickens, not crocodiles), and (2) the diversity among the bodily parts of each organism. Indeed, one of the major characteristics of development is that each species reproduces a characteristic developmental pattern. Development involves the expression of the inherited properties of the species.

This is to say that there are three problems: (1) vertically, that of specific characteristic continuity, or the information continuity of life; (2) horizontally, that of organ (including cells

and tissues) diversity, or the characteristic differentiation of life; and (3) overall, that of the developmental potentiality or developmental power of life.

In the development of Western biological history, there have been controversial different views. For the first two issues above, there have been basically two different views: the hypothesis of preformation and the hypothesis of epigenesis. However, these two basic views are always connected with the concept of teleology.

In the seventeenth century, a Western hypothesis of preformationism was suggested as a union of development and inheritance. According to this view, all organs of an adult individual are preformed in miniature within parental germ cells, the sperm or more usually the egg. Thus, organisms developed from a fertilized egg were not considered to be truly developed and newly reformed, but rather as unrolled from a preformed miniature (Bonnet, 1764; Gould, 1977; Roe, 1981; Gilbert, 1988).

According to this hypothesis, Gilbert (ibid) says:

First, because all organs were prefigured, embryonic development merely required the growth of existing structures, not the formation of new ones. No extra mysterious force was needed for embryonic development. Second, just as the adult organism was prefigured in the germ cells, another generation already existed in a prefigured state within the germ cells of the first prefigured generation. This corollary, called EMBOITMENT (encapsulation), assured that the species would always remain constant.

There are two difficulties in this hypothesis: (1) there is no cytological evidence to provide a lower limit to the state of the preformed organisms, even by light microscopy, nor in modern electronic microscopy; and (2) it only explains genetic continuity, but not the genetic variations, which did not pre-exist in the parental organisms.

In the eighteenth century, alternative hypothesis of epigenesis was then proposed: that the specific characteristics of each adult organism are developed anew from an

undifferentiated fertilized egg, namely, without a differentiated miniature individual within it. This concept of development had its philosophical roots as far as back to Aristotle and was revived by a German embryologist K.F.Wolff, by carefully observing the development of chicken embryos. Wolff demonstrated that the embryonic organs, such as the heart and blood vessels, could be clearly seen to develop anew in each embryo, and the intestinal tube was seen to arise by the folding of an originally flat tissue. Thus, Wolff (1767) proclaimed: "When the formation of the intestine in this manner has been duly weighed, almost no doubt can remain, I believe, of the truth of epigenesis."

However, the problem of discontinuity comes to this hypothesis as the issue of: how development of relatively constant specific characteristics could be explained. To overcome this difficulty, Wolff had to postulate an unknown force, the *vis essentialis* (essential force), which could organize the development of embryonic organs and act like gravity or magnetism. This postulation did not actually solve the difficulty of discontinuity, but only proposed a special power to promote embryonic development. Therefore, as Gilbert (1988, p.248) says: "Thus, preformationism best explained the continuity between generations, whereas epigenesis best explained the variation and the direct observations of organ formation."

Because both of the hypotheses of preformationism and epigenesism do not completely solve both of the problems of discontinuity and diversity, in the nineteenth century, the German philosopher, I. Kant (1724-1804), and his colleague biophilosopher, J.F.Blumenbach (1752-1840), attempted a reconciliation. Blumenbach postulated a mechanical goal-directed force, called the *Bildungstrieb* (development force), which was not theoretical but could be shown to exist by the experimentation of the regenerating processes of lower animals.

Blumenbach considered that some kind of purposive organizing force could be observed in operation. This *Bildungstrieb* was thought as a property of the organism itself and could be inherited through the germ cells. Thus, the development of organs could proceed epigenetically through a predetermined force inherent in the matter of embryo. Furthermore,

such a force was susceptible to change and then to produce the genetic variations (Cassirer, 1950; Lenoir, 1980; Gilbert, 1988).

Both problems of continuity and diversity seemed to be solved by this reconciliated hypothesis, where epigenetic development is directed by preformed and changeable instruction. However, there are still problems: (1) what is the nature of this *Bildungstrieb* force, (2) how does it originate, (3) can it inherit and be transferred from parents to their offspring, (4) how and from where can it get its goals, and (5) what is its connections with the mind or consciousness? It is similar to that Wolff's *vis essentialis* in the existence of these problems.

Continuity and discontinuity, stability and diversity will be further discussed in the next chapter.

3. Preformation plus Epigenesis without Special Goals

It is very interesting: if both of these hypotheses of preformationism and epigenesis, including their reconciliated one, are compared with the *theory of karma-seed / bija and the retribution of life* mentioned in Chapter 4, Part I, one finds that this Buddhist theory is somewhat similar to the hypothesis of Blumenbach. The characteristics of embryonic development are both preformed by the karma-force / karma-seeds stored in the 8th-consciousness (or *alayavijnana*) and by epigenetically conditioned-arising (or developing / manifesting) from *alayavijnana*. Because *alayavijnana* is continued, it can also explain the problem of continuity. Furthermore, karma-forces / karma-seeds are only potentialities, and their arising or developing / manifesting to actualities requires certain conditions. If the conditions of development are changed, then the resulting actualities also vary. Thus, this Buddhist theory can also explain variations. However, there are important differences between these viewpoints.

(1) Karma-forces are transformed from the eight consciousnesses, which are transformed from true-mind or *bhutatathata*. True-mind or *bhutatathata* is an absolute objective existence by itself (cf. Part I).

(2) The 8th-consciousness is the second type of life-form (or life-energy) as mentioned above. It is independent, and has its own individuality but does not inherit any thing from its parents.

(3) It is also conservative and continuous, but it transforms its expression according to the characteristics of its own karma-seeds. Therefore, it is both continuous and discontinuous, and deals with the existence of the interruptions of the three life-times of the past, the present, and the future. However, even between two life-times, it is continuous in that there still exists the intermediate form, the *antara-bhava*, of the 8th-consciousness. Thus, the karma-seeds manifest the physical body and all interruptive, but the basic life-energy of the 8th-consciousness, always continues.

(4) Unmatured karma-seeds are stored in the 8th-consciousness and are transmitted from past life-times to the present, and again from the present to the future, unless they mature and express certain kinds of retributions or characteristics in a specific life. After maturation and retribution, the karma-force or the energy of karma-seeds are transformed into other new unmatured seeds, again stored in the 8th-consciousness to be transmitted to the next life-time. This energy is conservative, can only be transformational but never eliminated.

(5) These karma-force / karma-seeds are neither mysterious within an unknown origin, nor uncaused in an inherent origin, but originates from the creation, actually transformation, of one's own mind / eight consciousnesses, interacting with the six external all types of physical

conditions, from something as large as the universe to that as small as the “mote-near-voids” (something like quanta or quarks or photons). In addition, karma-force / karma-seeds are controlled by the natural law of cause and effect, and not by mysterious forces. They develop according to this natural law, and not to mysterious goals or purposes.

(6) Furthermore the basic life-energy of the 8th-consciousness not only organizes embryonic differentiation and organ formation, but also directs consciousnesses differentiation and transformation from the 8th-consciousness. The 7th is the first and the 6th is the second. Then the first five sense-consciousnesses are transformed simultaneously with the differentiation and formation of the five sense-organs, which are the physical roots of that of the first five.

In the comparison of both Eastern and Western theories and hypotheses about preformation or epigenesis, continuity or discontinuity, one can see that Buddhist theories considered these problems deeply and completely, as early as in the 500's B.C. According to these comparisons, it is very clear that, concerning ontogenesis, that specific karma-force / karma-seeds, developmental potentialities, or genetic informations are genetically preformed, and that specific organs and morphogenetic characteristics are epigenetically reformed.

It is here that three points should be noted: (1) The concept of karma-force / karma-seeds or *bijas* is very useful for the explanation of ontogenesis. (2) It is also very useful for the explanation of phylogenesis and this will be discussed in the next chapter. (3) According to this concept, from the viewpoint of both ontogenesis and phylogenesis predetermined and directed by karma created in the past life-times, this may be said as teleology. However, from the viewpoint of karma to be created by oneself and not created by God or directed by special goal, this may be said as non-teleology. Thus, it is better to say that there is no necessary of special teleology to explain both ontogenesis and phylogenesis.

III. Three-Hierarchy Theory and Three Western Theories of Life

1. Three Western Theories: Vitalism, Organicism and Reductionism

In the history of Western biophilosophy, besides the problems of preformation and epigenesis mentioned above, the problems of (1) the nature of life and mind, (2) relationships between mind and body, and (3) the ontogenetic developmental force, since the time of Aristotle until now, have always been in controversies; and there are many different theories to explain these problems. Primarily, there are three: Vitalism, Organicism, and Reductionism. The details have been discussed in Part II and elsewhere. It is necessary now to make connections and syntheses with some notions of Eastern theories.

Vitalism originated from Aristotle, who wanted to actualize the abstract idea of Plato's *eidos* and to build a bridge between them and the phenomenal real life. Aristotle's bridge is a series of his ideas of *dynamis*, *energeia*, *entelecheia*, and *pneuma*. This bridge can be shown in Fig.67.

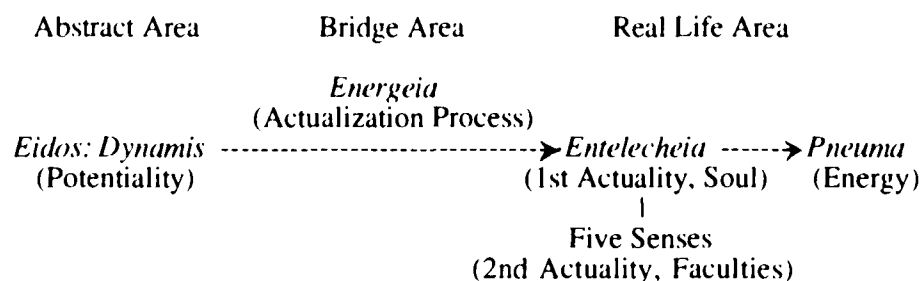


Fig. 67 Aristotle's Bridge between Plato's *Eidos* and Real Life

Aristotle's bridge is in the construction of his vitalistic theory of life, and its central idea is that of *entelecheia* or soul. Aristotle's *entelecheia* originated from Plato's abstract *eidos* and there was no method to identify it. Philosophically, this theory belongs to Idealism. However, *entelecheia* is independent of the physical body, so this theory also brings in the concept of the nature of Dualism. One can see that the problem of mind-body relationships already existed as early as the time of Aristotle.

Until the end of the nineteenth and the beginning of the twentieth century, under the influences of physics and chemistry, experimental embryology, genetics and cytology, although Driesch attempted to use experimental embryological method to prove the real existence of Aristotle's *entelecheia*, it was very difficult to convince a majority of reductionistic biologists that *entelecheia* actually exists. Because Driesch's concept of entelechy is non-material, and seems more abstract than that of Aristotle's *entelecheia* (again going back to Plato's idea of *eidos*), Driesch's experimental method was not good enough to prove the real existence of entelechy or vital-force. Furthermore, Driesch could not suggest the origin of his entelechy and how it inherits, even as suggested by Aristotle. Besides, Driesch's neo-Vitalism still brings in a Dualistic nature as that of Aristotle's Vitalism.

Nevertheless, Driesch raised very important ideas and problems about the nature of life, such as: the real nature of regulation, regeneration, and reproduction, the concept of morphogenesis, and physiological equilibrium and harmony. These concepts and the nature of life are very difficult to explain clearly and thoroughly with Mechanism or modern Reductionism. Although some of these concepts, such as regulation and morphogenesis, have been accepted by modern Reductionism, they are only used for mechanistic explanations and have lost their original meanings.

On the basis of neo-Vitalism and by the influence of the organismic philosophical ideas of Whitehead, the field theory of quantum physics, and some concepts of Gestalt psychology, a group of modern embryologists, such as Ritter and Henderson (Americans), Bertalanffy and

Weiss (Germans), Haldane, Russell, Needham and Waddington (English), since 1920's, developed another theory of life, Organicism. The basic concepts of this theory are: organization, regulation, hierarchy, wholeness, organizer, chreod, and field. This theory attempts to use these concepts to replace the concept of entelechy or vital-force and to avoid the mechanistic idea of Mechanism or Reductionism.

However, there are several problems in this theory: (1) it lacks a very strong central idea like that of entelechy or vital-force of Vitalism; (2) the different founders held somewhat different inclinations, such as Haldane and Russell inclined to Vitalism, Needham inclined to dialectic Materialism, and also held to Dualism; (3) it also lacks experimental bases, such as: the chemical basis of organizer supposed by Needham could not be identified, the inheritance of acquired character through the mechanism of canalization proposed by Waddington is actually a selection of multiple genes as discussed in Part II (Cai, 1960, 1962a, 1962b); and (4) the concept of field suggested by Gurwitsch and Weiss is vague not as clear as that of electricity and magnetism and that of gravitation.

Therefore, Organicism belongs to an intermediate state between Vitalism and Mechanism / Reductionism. This makes it not strong enough to oppose the other two theories.

In the seventeenth and eighteenth centuries, since W. Harvey (1578-1657) discovered the circulation of the blood in biology and I. Newton (1642-1727) established the laws of gravity and motion in physics, belief in Vitalism and vital-force became doubted and the mechanistic view of life came more and more to the force. After the entry of the theory of evolution of C. Darwin (1809-1882) in the nineteenth century, the rediscovery of the laws of heredity of G.J. Mendel (1822-1884) at the beginning of the twentieth century, and the further establishment of the law of genetic linkage of T.H. Morgan (1866-1946) in the 1930's, the particle concepts of genes and pangenes and the mechanical ideas of natural selection and environmental adaptation have been widely accepted by most biologists. Thus, the influence of Vitalism has decreased, and the influence of Mechanism / Reductionism increased. Until the

rapid development of molecular genetics and molecular biology since 1950's, Mechanism / Reductionism has almost fully controlled the field of life sciences.

Due to the development of biophysics and biochemistry and the modern fine equipment, life material can be analyzed more deeply and in greater details, and many micro-objects can be seen directly. Furthermore, many life problems can be identified by experiments under rigorously controlled conditions and be done in totally controlled laboratory conditions. The most surprising development was the discovery of the genetic material of the DNA molecule: (1) the strange nature of structure; (2) its ability of self-replication for continuity, stability and heredity; (3) its capacity to transcribe and translate genetic code and to transfer its carried genetic-information or genetic-program into proteins, enzymes and to cause the ontogenetic development of differentiation and morphogenesis of cells into tissues, organs and individual forms and shapes.

On the basis of these developments of molecular genetics, the other branches of biology have been reduced to the molecular level, as in the development of molecular neurobiology (or neuroscience) and molecular immunology. Thus, many micro-life phenomena can now be reduced and explained in terms of physicochemistry. Some biologists claim that biology is nothing more than a branch of physicochemistry, which is an extreme concept of mechanical Reductionism.

However, are life phenomena truly as simple as the explanation that Reductionism offers them to be ? Although Reductionism explains the life phenomena so deeply and rigorously, these explanations still belong to the pheno-world, and refer to the surface phenomena. According to the three-hierarchy theory, the modern Reductionism and molecular biological sciences, only belong to the first hierarchy or the type of life-form with shape and mass. Therefore, even modern Reductionism still leaves the most basic problems unsolved. These are:

(1) Is there any limitation in reduction ? Theoretically, there must be none, if reductionism is correct. In fact, the most important life material, such as DNA, biochemically can be reduced to a nucleotide, and this again to a nucleoside, and so on, until any basic particles remaining. Finally, even to the physical form can be transformed into energy. However, reduction is actually limited, and when the DNA molecule is reduced, its nature and activity are immediately lost. The same applies to protein molecule. Why is it that reduction applies only to these macromolecules ?

(2) Even these macromolecules are reduced to final basic particles, there must be a first cause determining the nature and characteristics of these basic particles. The question is what is this first factor, and theoretically, is this "first" actually infinite ?

(3) Why does DNA possess the ability of self-replication ? Why can chromosomes and cells divide ? Why can the transcription of messenger RNA and the translation of protein be regulated ? Why can the certain kind of gene(s) be turned on and turned off in an orderly way ? Why can enzymes catalyze and hormones regulate the biochemo-physiological metabolic processes ? What kind of life-force / life-energy directs these life activities and controls these life processes coordinated with genetic program ?

Although reductionists do not believe that there exist any life-force that controls organic development, they can not explain life-phenomena mentioned above thoroughly and completely. They only believe bio-energy, but they can not well explain the nature of the automatic movement and free will of bio-energy. They only believe the control of development by genetic-program, but they can not avoid the mechanical idea. They only believe the conservation of bio-energy, but they can not explain the true- (not pseudo-) continuity and conservation of life.

(4) Even though molecular biology can mechanistically explain biochemical processes from DNA to RNA, to protein folding, how does the genetic program further control the processes of cell differentiation, tissue and organ morphogenesis ? How does the genetic program control the shape and form of organs and that of the whole individual body ?

(5) How do genes control the intelligence, memory, and mind activities, and do then control fate and age ?

The Western theories of life may explain part of life problems, but they do not completely explain all of them. The basic problem in Western biophilosophy, as mentioned before, is that they lack a notion of the absolute noumenon, *bhutatathata*. Thus, the mind-body problem remains in argument and can not be totally solved. However, Eastern biophilosophy does not have this problem, and it is necessary to synthesize and complement with the West.

Bio-Meanism (or the dialectic-unified-monism) and the three-hierarchy theory of life are the preliminary syntheses, integrations, and complements of both Eastern and Western life theories. We now try to use these viewpoints to explain some basic life phenomena as follows.

2. Life-Energy /-Field and Fertilization

2.1 Prefertilization Stage: Life-Energy /-Field and Negative-Body

In the suggested system of life, life-force is in an absolute realm, and its expressions are in relative ones, in the form of life-energy which further divides into bio-energy and physical-energy / universal-energy. Life-energy is in the form of various consciousnesses.

The 8th is the only continuous one. The other seven disappear and reduce to the 8th at the end of each period of life, i.e. death, and reappear / redifferentiate after fertilization in a next life-time. Fertilization actually is defined as being when the 8th consciousness enters into / combines with an egg. Ontogenetic development is the expression and operation of this consciousness. During the process of embryonic development and morphogenesis, the 8th-consciousness gradually and sequentially develops and differentiates into the 7th, 6th, and the first five (the eye, ear, nose, tongue, and body) consciousnesses and their corresponding organs.

These concepts are different from Aristotle's *entelecheia* or vital-force, Driesch's entelechy, Bergson's *elan vital* (Bergson, 1911 / 1975), Wolff's *vis essentialis*, and Blumenbach's *Bildungstrieb* (Gilbert, 1988). Concerning ontogeny, we basically accept Buddhist theories, but try to integrate and explain them in terms of modern biophilosophy. Thus, the major concept of life-energy is in accordance with the Buddhist total concept of eight consciousnesses.

The concept of genotype and phenotype in modern Western genetics can also be applied to the concept of the 8th-consciousness. This is because the central concept of the latter is seed or *bija* (cf. Chapter 4), and it possesses two types: an unmatured or potential one and a matured or an actual / manifested one. The first is equivalent to the genotype, and the second to phenotype.

From another standpoint of view, it may also be said that the intermediate-existence (Buddhist term: Zhong-Yin-Shen, the intermediate-negative-body, or simply the negative-body, occurring between two life-times) is the genotype, and the physical body (or called the positive-body) is phenotype.

The genotype of life, intermediate-existence / negative-body, is only a developmental potentiality or a type of life-energy, which may be an ultra short wave. So, it is beyond our sense ability, just like the genotype, in Western modern genetics, which is unable to see directly

(Although certain structures of DNA or chromosomes can be seen now, strictly speaking, they already do not belong to the genotype but to the phenotype). However, the genotype of life can be seen or felt after enlightenment while one's sense ability has been enhanced.

Although enlightenment is not easy to attain, if one can practice and do continuously, everyone can attain it finally. Different degrees of practice will yield different degrees of enlightenment. Even though not everyone can attain enlightenment at this life-time, only some enlightened persons can see the genotype of life---it is proved to be true. This is just like not everyone to be able to become a Newton, an Einstein, a Darwin, or a Mendel. Although scientists can repeat their results, the proportion of scientists to human population is also less.

Many Western scientific facts are proved only indirectly, such as the structure of molecules, atoms, electrons, and other basic particles, no one can see them directly. If Western scientists use modern scientific equipments (or to develop certain kinds of new equipments) to explore and test the existence of the genotype of life or negative-body, it may be also proved indirectly. The genotype of life or negative-body can be considered as an energetical genetic-program in which is stored a set of unmaturing genetic-seeds (or energetical-/ mental-genes) with potential genetic information of all past life-times.

Therefore, the genotype or negative-body of a human individual is considered not only as an abstract potentiality, but also as a concrete energy-entity. In the broad sense of the system we presented, such an entity can not be mechanically explained nor be limited in its physical form. All material, in a rigorous sense, is only some kind of false form, which is contemporarily aggregated (conditioned-arising) from energy under certain kind of conditions. In contrast, the Western genetic concept of genotype is only a developmental potentiality, with nothing to be seen directly.

A majority of people, after death, will feel everything in darkness and are in a highly delusive condition for the first seven days. Their 8th-consciousness remain in an undifferentiated state, in which the karma-seeds stored in them are not yet mature. After seven

days of this latent-energy stage, karma-seeds become matured, and then are differentiated and transformed into the negative-bodies. The life-time of these negative-bodies is very short, varying from seven days, to twice, or even thrice seven days, up to seven- days (there always seems to be a “seven-days” interval). Because both the latent developmental (all only seven days) and the life-time stages (only seven to forty-nine days) of the negative-bodies are very short, their differentiations are very simple and share several common characteristics:

(1) A negative-body is not a physical body and possess only the 8th consciousness, so it is a pure consciousness-energy / life-energy without mass. Its energetic bodily feature is smaller than that of adult human-beings, only around three feet high (Hui-Guang, 1961, p.134). It may belong to a certain kind of ultra short wave, so can move very fast and not be hindered by the material of this world. Thus, it may be considered as an energetic-aggregate of activity-center carried with a set of genetic-information (unmatured karma-seeds / *bijas*).

(2) When a negative-body lives either to seven, or to the maximum of forty-nine days, it dies. It is like a positive-body, which is completely directed by its genetic karma-seeds and controlled by *the law of cause and effect*, but not by any special supernatural forces or goals.

(3) After the negative-body dies, its 8th-consciousness has to undergo reborn. Its life-force / life-energy acts as the power of fertilization and enters into the next new life-time. The negative-body-stage is a preparation period for the maturation of genetic seeds to be retributed and entered into the next life-time.

Hereditary issues will be discussed in the next chapter. Here, we focus on the discussion of the three major components of ontogenesis: fertilization, differentiation, and morphogenesis. Using the concepts of genotype and phenotype outlined above, these three

ontogenetic components may be explained more clearly. It is now turn to the discussion of the phenomena, process and nature of fertilization in the following section.

2.2 Fertilization Stage: the Entrance of Life-Energy /-Field or Negative-Body

According to the concepts of the present life-system, fertilization can be considered as what Buddhist theory considers the 8th-consciousness entering into the egg. Concerning the material basis of the embryological physiological and biochemical processes, modern developmental biology has already done a lot of very deep researches and obtained a lot of data. What we want to do here is how to explain these physical / phenotypical phenomena with biophilosophical / metabiological Buddhist views and to complement the “metabiological missing-link” of Western modern biology. According to Buddhist views, the fertilization process of human-beings takes several steps as described below (Hui-Guang, 1961, p.133):

(1) When the genetic karma-seeds of a negative-body have been matured and according to *the law of cause and effect* will still get a retribution of human body (not to the other ways of the six mentioned in Part I), this body can feel the aura light radiated from a mating couple, to whom he / she has a cause-effect relationship during the past. Then, because of the attraction of the sexual love-desire and the karma-forces of this body, under the integrating-action of the cause-effect-condition, the 8th-consciousness is attracted to and attached on one of the two bodies of this mating couple.

(2) According to the principles of sexuality: *the attraction of the different and the rejection of the same*, if the 8th-consciousness of this negative-body will have a male retribution, it attaches on the body of the male of that mating couple and together with the attached male-body to continue the mating action with that female; or *vice versa*. However,

due to the limitation of the sense ability, that mating couple does not feel this attached negative-body.

(3) Concerning the sex determination in human-beings, the modern Western genetics and cytology have discovered these facts that: (i) human sex-determination connects with certain type of sexual-chromosomes, (ii) there are two different types of sperms, Y-chromosome carrier (Y-type sperm) and X-chromosome carrier (X-type sperm); (iii) there is only one type of ovum, which only carries X-chromosome (X-egg); and thus (iv) male- or female-sex of the offspring determines by the sperm type of the male parent: if the sperm carries X-chromosome, the result of a fertilization will produce a female body (i.e. XX-somatic chromosome pattern); and if the sperm carries Y-chromosome, the result of a fertilization will produce a male body (i.e. XY-somatic chromosome pattern). It is very strange that although the Buddhist theory was established 2,500 years ago, it had also known the facts, very similar to that known by modern genetics and cytology, that there exist two different types of sperm: male-strong-sperm and the female-strong-sperm .

(4) Because of the existence of two types of sperm, after sperms entering into the body of the female of the mating couple, if the attached 8th-consciousness belongs to male, then it will transfer to attach on the male-strong-sperm; if it belongs to female, then it on the female-strong-sperm. This sperm-choice process of the 8th-consciousness is determined by the karma-force attracting relationship.

(5) Due to the power of the 8th-consciousness, the 8th-attached-sperms acquire the strong moving ability toward the ovum and also have the ability to penetrate into and combine with the egg nucleus. Thus, the fertilization is finished and the fertilized egg acquires a big power to promote and start the egg cleavage.

These are the Buddhist views of the whole fertilization process. Its basis is a karma-energetical rather than a material interaction. The material interaction is only a phenotypical surface phenomenon but not the true nature of fertilization. Because these views were established 2,500 years ago, it was impossible to describe the physical processes in great detail. However, the concept of the 8th-consciousness can explain the fertilization process more reasonable not only than the concept of vital-force or *entelecheia* of Vitalism, but also than the mechanical physico-chemical concept of modern Reductionism.

It is now if both of the Buddhist and the modern reductionist views are synthesized and complemented together, then the process of fertilization can be understood more concretely and thoroughly. There are several things which can be used as examples and explain as follows:

(1) Although the modern biology knows the phenomenon that only one sperm can be allowed to enter into the ovum, but it did not yet talk about this in the Buddhist view. Thus, this phenomenon can be complemented the Buddhist view. However, if one asks why after one sperm enters into the ovum, which can immediately produce a layer of fertilization membrane to prevent the entrance of the other sperms, modern Reductionism can only explain this as a kind of adaptation ability, resulted from evolution.

(2) If one further asks why certain one of the hundreds and thousands of sperms can enter into the ovum? Modern Western genetics can only explain it as a random event. There is without cause and effect relationship between this sperm and the ovum. However, Buddhist view holds that there also exists cause and effect relationship between the successfully entered unique sperm and the ovum. It is because this sperm is attached by the 8th-consciousness of the original negative-body.

(3) Why can this individual 8th-consciousness be attracted to this mating couple and it likes to attach on one of the mating couple's body, and then transfers to a certain type of sperm, and finally even attaches on certain unique sperm ? It is because there exist the cause-and-condition relationships, during the past life-times, between this individual 8th-consciousness and the mating couple. Therefore, there will have the cause-and-effect retribution relationship between parents and their child / children . This process is completely not at random. The material bases (the genes, chromosomes and some cytoplasmic organelles, such as the mitochondria) of the genetic-structure / -program of male's sperm and that of female's ovum, are only conditions for the attraction of the parents and the selection of the offspring's 8th-consciousness (actually its genetic karma-seeds */bijas*) to attach, and / or in other words, the conditions for the combination of these three individuals.

(4) It is clear that the fertilization is actually the combining of the genetic-material / -program of the parents with the 8th-consciousness of their future daughter or son. This process is totally not an occasional event, but is completely belonging to the genetic karma-force interaction and retribution among these three individuals under the action of cause-and-conditions controlled by *the law of cause-and-effect*.

Due to this specificity of the cause-conditions-effect-retribution relationships, the fertilization process must be an "one to one" (for the sperm) and "one to two" (for parental body) unique relationship. Thus, only one specific sperm, which is attached by the 8th-consciousness of the future daughter or son and is of the future parental cause-effect relationship with the mating couple, possesses specific power to penetrate into the ovum. once a specific sperm gets entrance into the ovum, it possesses the power to immediately prevent the entrance of the other sperms as what is seen in modern embryological experiments.

However, this may be actually only a false phenomenon, because the other sperms are not attached by the 8th-consciousness and do not have a specific power to penetrate into the

ovum. The formation of the fertilization membrane of the fertilized egg may be only a natural reaction after the fertilization, or more exactly to say the entrance of the 8th-consciousness.

(5) Before the entrance of a specific sperm into the ovum, it may be able to consider that the 8th-consciousness firstly is only an unspecific attachment on all sperms, and makes them to be able to move and arrive at the surface of the ovum. However, it may be finally due to the adjustment of the corresponding cause-and-condition relationship among the 8th-consciousness of the negative-body and the conditions of the genetic-structure / -program of the mating couple, the 8th-consciousness chooses / selects a most suitable sperm to attach on and penetrate into the ovum.

Then, the rest sperms are lost the attachment of the 8th-consciousness and simultaneously also lost the penetrating / fertilizing ability. The process of the selection of a sperm, which is carrying the most suitable genetic-structure to fertilize / combine with the specific ovum (generally only one), is a very precise issue. This issue is completely interacted by the common genetic karma-forces of the negative-body's 8th-consciousness (future offspring) and the two mating bodies (future parents), and is also rigorously controlled by *the law of cause and effect* and is not controlled by their subjective willingness.

This selection process may be said that it is controlled by a most precise soft-program of a biggest "natural energetic formless computer". This is the situation in the delusive world, therefore, everything is controlled by karma-force and there is no true free-will. After enlightenment, while one enters into the enlightened-world, then one recovers the true free-will. Although the *law of cause and effect* still exists, the action relationship is already changed.

3. Life-Energy /-Field and Individual Development / Morphogenesis

Although body-forms are in cycle of death-destruction-birth-reconstruction, with periodical transformation and circulation, a positive-body-form in each life-time is not preformed / pre-existing in the sperm or ovum, and it has to be reformed during each rebirth. Thus, from the view of positive-body or present life-system, it does not belong to Preformationism but to Epigenesism.

However, the genetic-information /-program, or the genetic karma-force /-seed (*bija*) stored in the 8th-consciousness, or the developmental / morphogenetic blueprint of life-form is already determined and pre-exist, although only in potentiality and not yet actualized / manifested into pheno-life / body-forms. Thus, considering the potentiality of life- energy or geno-life, the present life-system may also be applied to Preformationism, but it is also applied to the Epigenesism and without any special goals and supra-power.

4. The End of Individual Development and the Meaning of Death

The meaning of “death” is only an indication of the finishing of one life-time and the destruction of a physical (positive) or energetic (negative) body-form. The meaning of “birth” or “rebirth” is only an indication of the start of a new life-time and the reconstruction of a physical or energetic body-form. The phenomenon of death can be seen as a sign of ending, and that of birth / rebirth seems to indicate a sign of beginning. However, these are only false relative phenomena of the transformation of the physical-form. Death is not true death nor true ending, and birth / rebirth is not true birth / rebirth nor true beginning, because the life-force and life-energy are completely conservative and continuous, they are without birth nor death, nor beginning and ending.

Life-force and life-energy (the 8th-consciousness) or noumo-life and geno-life (genotype of life) are outside of birth-death cycle, and are a continuum; since the cycle only applies to pheno-life or physical- and energetic-body-forms. These phenomena apply to the periodic transformations of the retributions of karma-forces / -seeds, which are stored in one's 8th-consciousness and are created / transformed by oneself (not by others or other powers).

From another point of view, death occurs when the originally differentiated eight consciousnesses are dedifferentiated (reversely differentiated) and reduced back to the 8th-consciousness, with the destruction of their original corresponding organs / body-forms. Birth / rebirth occurs when the reduced 8th-consciousness again redifferentiates and forms the other seven consciousnesses and their corresponding organs / body-forms again.

Chapter 19 A New Concept of Ontogeny(2): Neo-Geneticism

I. Introduction and Definition

In above two chapters, the concepts of three life-elements, the dialectic-unified-monistic system of life, the noumenology or the statics of life, and the ontogeny, phenomenology or the dynamics of life, have been described. There are basically two different aspects of the phenomenology of life: ontogeny (individual development) and phylogeny (evolution). Inheritance is the intermediate state of the two, but it is here to be included in the category of ontogeny. Individual development (neo-Determinism) was mentioned in the last chapter, and in this chapter, inheritance (neo-Geneticism) will be discussed.

Although there are three elements of life: life-force, life-energy, and life-matter (material), they are basically expressed in two aspects: noumenon (noumenology, life-force, or noumo-life) and phenomenon (phenomenology, life-energy and life-material, or pheno-life). From the viewpoint of phenomenology, the phenomenal life / pheno-life is actually a continuum, a stream or a spring of different life-times, or a dialectic unification of continuity and discontinuity. More precisely, between continuity and discontinuity, there are two intermediate features: semi-continuity and false (pseudo)-continuity. The relationships and classification of these concepts can be shown in Fig.68.

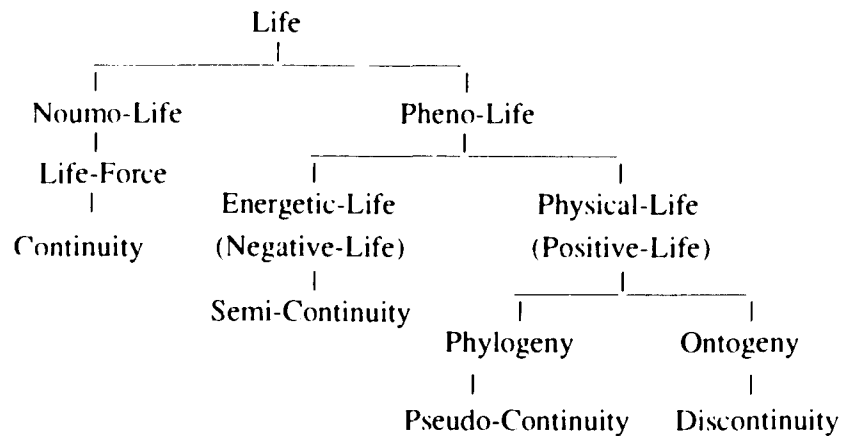


Fig. 68 Relationships among Life-Forms, Continuity and Discontinuity

Here, the discontinuity of ontogeny is viewed from the hierarchical level of the whole long stream of life in the discontinuous unity / link of a life-time. If one views from a different hierarchical level, the figure is totally different. Developmental ontogeny as discussed in last chapter is viewed within a unity / link of a life-time or intra-life-time. In this chapter, however, genetical ontogeny is viewed between two life-times or inter-life-times, namely, inheritance.

On the bases of one (pheno-life) of the two life-categories (noumo- and pheno-life), and two (life-energy and -material) of the three life-elements / hierarchies (life-force, -energy and -material), it is here suggested another new concept of neo-geneticism, which can be defined as follows:

Neo-geneticism means that there are: (1) two types of genes, i.e. psycho (mental) and physical genes; (2) two categories of genotype and phenotype (geno-pheno-types), i.e. psycho (mental) and physical geno-pheno-types; (3) two types of germ-lines, i.e. familial and individual germ-line; and (4) two types of inheritance, i.e. familial and individual-inheritance.

Western modern genetics only deals with one of these types, thus, it can not offer complete explanation about the hereditary life phenomena. It is here attempted to offer a synthesis of Western modern genetic concepts with Eastern ancient genetic concepts, to try to better explain hereditary life phenomena.

II. New Explanation of Inheritance (1): Two Types of Genes

I. Similarity & Variability or Continuity & Discontinuity

Similarity / stability or continuity and variability or discontinuity, gene and genetic-information, genotype and phenotype, segregation and recombination, mutation and variation, expression and regulation, transcription and translation, chromosome- / cell-division and DNA self-replication are the major concepts of Western modern genetics. All of these can also be explained by the actions and functions of life-energy, life-field and life-information of the 8th-consciousness.

There are two sides of inheritance: continuity and discontinuity. Continuity is expressed by the similarity or stability between parents and offspring. Discontinuity is expressed by the dissimilarity or variability between parents and offspring, and is also expressed in the disruption of the physical body. However, the continuity from similarity or stability is only phenotypic, and is pseudo-continuity. True-continuity is based on the continuity of life-energy, and the discontinuity is the inherent nature of life-material and even the physical-world. Life-energy (mainly the 8th-consciousness) is continuous and conservative and life-material is discontinuous and non-conservative.

Although inheritance exists in this two-sided-nature, based on continuity and discontinuity of life-energy and life-material, Western modern genetics is only concerned with one side that of life-material. Here, two-sided-nature is strongly emphasized, especially, that of the side of life-energy rather than that of life-material.

2. Two Types of Genes: the Mental (Psycho) and the Physical

According to the concepts proposed above, it can be deduced that there are two types of genes or life (genetic) seeds / *bijas* : mental and physical. In Western genetics, from Mendel, Morgan, Dobzhansky to Watson-Crick, the concept of the physical-gene has been developed from the individual level to the cell level, and recently to the very deep molecular level. However, the other side, mental (psycho)-gene (*bija*), is neglected and knows very few.

The concept of the mental (psycho)-gene (*bija*) is developed from the Buddhist theory of karma-force and karma-seed /*bija* (cf. Chapter 4, Part I). It integrates Eastern Buddhist genetic concepts with that of the West, and is defined as follows.

A mental (psycho)-gene (bija) is a psycho-genetic unit, which is stored in the 8th-consciousness and is relatively semi-continuous through three life-times of the past, the present and the future. It is essentially an unit of life-energy, to be transformed by the mind activities, i.e. the activities of the first seven consciousnesses (mainly by the 6th & 7th in the aid of the first five consciousnesses). It is an unmaturing psycho-genetic potentiality. In the process of inheritance, the mental-gene / bija is a true genetic-cause, but the physical-gene is only a genetic-condition, which conditions the development and actualization of the mental-gene (bija) to be manifested into a corresponding genetic character.

From the standpoint of preformationism, the nature of ontogenesis is really an actualization of the potentialities of the mental (psycho)-genes (*bijas*), which are preformed by the psycho-energy-field activities in past life-times and are continuously stored in the 8th-consciousness. The expression of physical-genes, in the morphogenetic developmental process of ontogenesis, is only conditions for the expression of mental (psycho)-genes (*bijas*), which belong to real-cause. However, if real-cause is of no condition(s), it can not express and produce effect / result.

Therefore, the morphogenetic developmental process of ontogenesis is actually directed by the preformed energy-field of the mental (psycho)-genes (*bijas*), and not by the physical-gene activities, which are only conditions but are also necessary for development. Because the Western modern genetics only considers the physical-gene activity to be the real-cause, it neglects the case that the actual real-cause is the mental (psycho)-gene (*bija*). Thus, it can not accurately explain the morphogenesis of organ and body shapes and forms, or color patterns of birds and insects, all of which can be more adequately explained in view of energy-fields being pre-determined by mental (psycho)-genes (*bijas*).

3. Two Hierarchies of Genotype and Phenotype

It is a fact that there actually are two hierarchies of genotype and phenotype: that of physical / material and that of psycho / mental or the energetic / field.

Western modern genetics only deals with one. Because the objects of this category are within the power of the human senses, one can directly or indirectly observe them. Biologists generally believe in their existence, but in our frame work these things / life-material belong to the lowest life-hierarchy. The criterion of existence of the three life-hierarchies / life-elements can not be determined by whether or not they can be observed by physical organs, because the

resolving power or discriminating ability of physical organs / life-material itself is limited, and is small. An accurate scientific attitude, for the realization of the existence of different life-hierarchies, can not depend on or solely believe in the sense ability of physical organs, especially sight, even with the aid of the modern precise equipment.

The concept of genotype and phenotype, in Western modern genetics based on life-material, moves Mendel's hypothesis of hereditary-factor, to Morgan's chromomere of gene, and finally to that of the actual DNA molecule. We now develop the concept of life-hierarchy, raised to the second level of the life-energy /-fields. This life-hierarchy actually belongs to that of the psycho- / mental-hierarchy, along with the concept of genotype and phenotype.

In this level, the genotype refers to the genetic seed */bija* system of the 8th-consciousness, and is the potentiality of the psycho-genetic structure, which determines the pheno-life /-forms (both mental and physical). The phenotype means the expression or manifestation of the genotype, from the potentiality to actualize / transform into actuality, which belongs to the realm of the mental or energetical but not to that of physical or material. This level of genotype and phenotype is causal, and the genotype and phenotype of life-material level are the conditions. It is only when these two levels of genotype and phenotype integrate and interact, then retributions (both physical, mental and behavioral) are produced.

It is a fact that the physical geno-pheno-type is controlled / directed by the psycho-genopheno-type, which acts within the type of energetic field. The pscho-genotype is the first or basic genetic-program / genetic-blueprint. Due to its energetic and field nature, it can direct the morphogenesis and transformation of the bodily form and shape and the mental behavior. It can be considered that the bodily form and shape are the production of the composition both of the physical-phenotype and the psycho-phenotype.

Therefore, there are actually existing two hierarchies of geno-pheno-types, otherwise, we can not completely explain the morphogenesis of bodily form and shape and the development of mental activities and behavior. However, in the broad sense and dialectically,

these two hierarchies of geno-pheno-types can also be unified as one, that is, that of the second (life-energy) of geno-pheno-type may be said as the genotype, and that of the first (life-material) of geno-pheno-type as the phenotype. More broadly and dialectically, one may also consider the third hierarchy of life-force as the true-genotype, and to unify both the first (life-material) and the second (life-energy) as the general-phenotype. In this view, generally speaking, the absolute-realm of noumo-life (or true-mind, self-nature, *bhutatathata*, *dharmakaya*) belongs to genotype, and the relative-realm of pheno-life (both semi-material / energy level and material / matter level) belongs to phenotype. This is the deepest and most thorough concept of geno-pheno-types.

Furthermore, the automatic and dynamic ability of the self-replication of DNA and that of the divisions of chromosomes, cell organelles and cells, are also obtained from the expressions of the power of life-energy. Without this power, there can be no physical-life and physical-genetics.

III. New Explanation of Inheritance (2): Two Types of Inheritance

1. Two Types of Germ-Line and Inheritance

Because there are two type of genotype and phenotype, there must also be two types of germ-line and inheritance. They are that of individual-germ-line / individual-inheritance and of familial-germ-line / familial-inheritance. These are described as follows, respectively.

The concept of individual germ-line and individual-inheritance holds that they possess individuality and can be continued after death. Inheritance is a continuous phenomenon of the transmission of certain genetic characteristics, and germ-line is a lineage of the transmission of certain genetic entities, mental or physical. Individuality refers to specificity, separation, and independence for each other. Therefore, individual germ-line / -inheritance expresses the transmission of the genetic entity (germ) / characteristics, continuously, individually and essentially, and is not interrupted by the phenomena of birth and death.

This type of germ-line / inheritance belongs to the second life-hierarchy and is determined by the continuity and conservation of life-energy, which is based on both of the 8th-consciousness and the set of karma-seeds */bijas* stored in it. Because of these two somewhat different bases, there are two somewhat different continuities: that of the 8th-consciousness and that of genetic karma-seeds */bijas*. The continuity of the 8th is basically without beginning or end, existing eternally. However, the continuity of the karma-seeds */bijas* is only continuous between different life-times, such as, from the past life-time (s) to the present, or from the present to the future. It is only a relatively short term of continuity, and it possess both of a beginning and an ending. Because as in a period of life-time, there exists a developmental process of production-maintaining-transformation, the karma-seeds */bijas* are not eternal but almost always overlap between different life-times. Therefore, this is a short-term continuity, but longer than a period of one life-time.

Familial germ-line and familial-inheritance refer to the lineage of the transmission of genetic entity (germ) and characteristics. Their hereditary phenomena only occur between the parental and offspring families by the aid of conditional life-material. This type of germ-line / inheritance belongs to the third life-hierarchy and it is determined by the discontinuity and non-conservation of life-material. Therefore, familial germ-line / inheritance is interrupted by the occurrence of birth and death, and it looks seemingly continuous but actually is only a kind of pseudo-continuity. There is similarity in genetic information contained in genetic material DNA

between the parents and off-spring, but there does not exist true-continuity. Because DNA replication is only a pseudo-continuity, the replication of material does not truly continue.

Furthermore, from the view of personality / individuality, after one's death, one's DNA molecules are really interrupted / discontinued. The transmission of DNA molecules and genetic-information / -program, through both sexual cells of both parents, to their offspring has indirectly "walked on a sideway" (or the parental-way), but not directly "walked on a normal middle way" (the personal individual way). Stated rigorously, only the latter can be called true-inheritance; and the former should be called the transmission of hereditary conditions, because it is without individual personality (or the 8th-consciousness).

If there is no transmission of an 8th-consciousness, there can not be true-inheritance. In the new concept of inheritance, there are two essential key concepts. First, what is truly inherited is cause but not conditions. The cause (or called hereditary- / genetic-cause) is the true continued 8th-consciousness carrying with its genetic (karma)-seeds / *bijas*. The conditions (or called hereditary- / genetic-conditions) refer to hereditary material, DNA molecules. Second, the true-inheritance is limited to the animal kingdom including human-beings. There is no true-inheritance in the plant kingdom. Because all plants do not contain the 8th-consciousness, therefore, in the plant kingdom, only pseudo-inheritance exists.

Since Mendelian law of genetics were dramatically rediscovered in 1900, Western modern genetics actually pertains to one of the two types of inheritance, namely, the familial-inheritance of the first hierarchical physical-life, with no conceptual structure to deal with the idea of the individual-inheritance of the second hierarchical energetic-life. The continuity of familial-inheritance only pertains to pseudo-continuity, its material basis of DNA molecules is only condition for the expression of semi-continuity, i.e. individual-inheritance.

These two types of inheritance are naturally closely connected, interacted with each other, and can not be separated. Some Buddhists think that Western modern genetics needs to integrate and complement the concepts of Eastern genetics. Thus, the modern genetics can

further develop into more advanced level, and can realize the facts of inheritance more clearly and completely.

In recent years, some molecular biologists and biophysicists have tried to connect ideas about basic life and genetic material, DNA molecules, with concepts of quantum particles (Popp, et al., 1989; Peat, 1991). It has been discovered that DNA molecules may be giving off a very weak level of radiation, just a few photons at one time and to be acting like a laser to produce collective vibrations in an electromagnetic field. This fact may be a preliminary connection with the concept of the field of life-energy, the second hierarchical inheritance. It is a good start and needs to be further developed in the system of neo-geneticism.

2. Dialectical Relationships between Two Types of Inheritance

In the universe, everything is dialectical. Nothingness gives birth to oneness; oneness possesses totipotentiality; totipotentiality includes twofoldness: absoluteness (noumo-life /-force) and relativeness (pheno-life /-energy). In the same way, relativeness relates to another twofoldness: life-energy (individual-inheritance / evolution) and life-material (familial-inheritance / -evolution). In these dichotomic couples, two components can transform each other, and individual- and familial-inheritance can also do so.

As stated, individual-inheritance is the cause and familial-inheritance is the condition. However, both the relationships of cause-effect and of cause-condition can also transform each other. Thus, the ontogenetic process is the turning point of the transformation of the two types of inheritance. In the ontogenetic process, there are two basic developmental stages: the embryonic and the adult. They are further discussed separately in the next two sections.

3. Transformation during the Embryonic Stage within Morphogenesis

The last chapter concerned the fertilization process, and how the 8th-consciousness attaches to a male-parent's sperm as a vehicle to enter into a female-parent's egg and combine together to start embryonic development. The genetic-program (both genetic-material and genetic-information) in the sperm of male-parent is condition for the 8th-consciousness to combine with that of the egg of female-parent. If the 8th-consciousness does not obtain both these parental conditions of genetic-programs, it can not actualize its genetic developmental potentialities (its genetic karma-seeds */bijas*), and begin its development of the new life-time.

Therefore, fertilization, from neo-geneticismic perspective, is the combination of the 8th-consciousness with both of parental genetic-programs. In other words, this is a combination of both types of inheritance. However, the 8th-consciousness comes neither from male-parent nor from female-parent, it comes from the third independent individual. According to this point of view, parents actually do not produce the 8th-consciousness of their offspring, but only produce their offspring's physical-body.

Thus, the 8th-consciousness is actually conservative and possesses its own individuality without birth and death. Something has the phenomena of birth-death, it is only the physical-body (including the physical-genes and genetic-information), which is only the physical condition for the delusive phenomena of the transformation of the 8th-consciousness in the process of long life-times of transmigration by the power of karma-force created from one's own mental (i.e. the other seven conscious) activities.

After fertilization, the 8th-consciousness immediately starts its developmental process, and simultaneously, the interaction and transformation of both types of inheritance also begins. Thus, the developmental processes can be considered as the interaction and the reciprocal transformation of the two types of inheritance.

The 8th-consciousness or life-energy is actually a powerful automatic / dynamic developmental power. It is conditioned by the familial-inheritance, i.e. the physical genetic-programs of both parents, as its material basis. It catalyzes / actualizes the psychic-genetic-program and re-organizes the necessary material from the female-parent's body to re-construct the physical body according to / under the direction of the psychic-genetic-program / -blueprint determined by the genetic (karma)-seeds */bijas*.

Here, the genetic (karma)-seeds */bijas* are stored / carried in the 8th-consciousness of the offspring, which is independent of, but having some similarities with, the 8th-consciousnesses of both parents as conditions. The important point is that this genetic-information is a type of force / energy or field. By combining the offspring's psychic-genetic-information (cause) with the parental physical-genetic-information (conditions), embryonic development, differentiation and morphogenesis proceed and finally a specific genetic-physical offspring's body (result) is re-organized and re-constructed.

During these individual embryonic developmental / morphogenetic processes, from the molecular level of DNA replication, RNA transcription, protein translation, enzymatic catalysis, metabolism and catabolism, energetic transformation, to the cell level of chromosome / organelle / cell division and differentiation, until tissue and organ induction and formation by the inducer / organizer, all of these are activities of the life-energy / 8th-consciousness and expressions of its psychic-genetic-information.

In this stage, from the first time of DNA replication resulting in chromosome and cell division, i.e. the fertilized egg cleavage, individual-inheritance begins transformation into familial-inheritance. This means that the genetic-program, from DNA molecular change and development of germ cells, begins rebuilding in the new life-time. During this process, the structure of genetic-program stays relatively stable, and the germ cells remain undifferentiated until adult individual in which they redifferentiate into new generative cells. This process, from

germ cell to germ cell, is generally called “germ line”. To keep a germ-line undifferentiated is a very important action of the 8th-consciousness. By virtue of this germ-line, one individual 8th-consciousness can connect with another, with the latter having some common karma-force / genetic-information with the former. Then, by this continuity / pseudo-continuity of physical type of germ-line, the familial-inheritance is formed. The relationships between germ-line and the two types of inheritance can be shown in Fig.69.

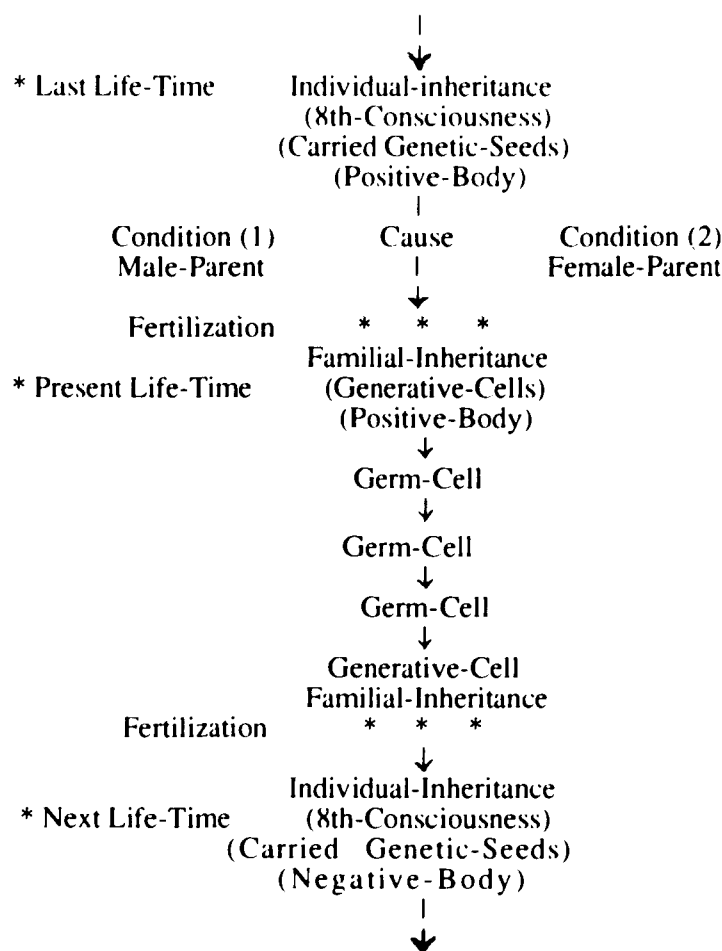


Fig. 69. Relationships between Germ-Line and Two Types of Inheritance

The positive / physical-body and the negative / energetical-body are actually combined together and unable to separate each other, thus, they are not dualistic. However, the positive-body is discontinuous and the negative-body (essentially, the 8th-consciousness) is continuous.

4. Transformation during the Adult Stage by Psycho-Activity

Before the birth of an individual, the power of embryonic activity is based solely on the 8th-consciousness (life-energy), because the other seven consciousnesses are not yet differentiated or active (later stage). After birth, however, due to the differentiation of the other seven consciousnesses, sensational and psychological activities start. Thus, the biological activities of an individual can be divided into two categories: mental / psychological and physical / physiological. Psychological factors are directly controlled by the seven consciousnesses, and the 8th-consciousness occupies the background. Physical factors are directly controlled by the 8th, and the other seven, principally the first six, do not directly control basic physiological activities. This is named as the mind-body relation problem.

According to the system presented here, the mind-body problem is produced from delusions about and the separation of the 8th-consciousness from the first seven consciousnesses, especially the 6th. This problem can be solved by mental training and meditation practice to clean out or remove the obstacles between these and the 8th-consciousness. This is because the first seven consciousnesses are differentiated from the 8th, and all the consciousnesses are basically rooted in Wholeness. Through this, one can in different degrees (according to different degrees of enlightenment) directly control, or have access to control physical bodily / physiological activities of the first six consciousnesses together with the 8th.

The functions of the two categories of activities during the post-birth stage are somewhat different. The 8th-consciousness directly controls physical activities according to the genetic (karma)-seeds stored in it, and manifests / transforms them into life-material by absorption and organization of environmental material to re-construct the physical body. This means that it only manifests the existing genetic (karma)-seeds but does not create new ones.

However, the functions of the first seven consciousness-system are both manifestation and creation through their mental activities. From the standpoint of the first stage of manifesting the original karma-seeds in the 8th-consciousness, original genetic (karma)-seeds are causes; and from the standpoint of the second stage of creating new genetic (karma)-seeds by the activities of the first seven consciousnesses, new genetic (karma)-seeds are effects / results. From the standpoint of the future, however, these newly created genetic (karma)-seeds become causes of future or next life-times and are again stored into the 8th-consciousness. This is called "cause and effect go through three life-times of the past, present and future".

Therefore, material- / physical-life is created by the life-energy (the first seven-consciousness-system is the creator and the 8th is both supporter and carrier). Life-energy is created by life-force (the true-mind or the original power with totipotentiality). In this consideration, life-force (the original power of totipotentiality) is not a special power transcendental of nature, but exists in nature and also within every one's body, which is only its activity and transformation center.

One's body creates one's genetic-karma, and one's genetic-karma again creates one's body. This creative power is one's own mind-force, including the true-mind-force and the false-mind-force, i.e. the force of the eight consciousnesses. This is the essential meaning of the new concept of life, the dialectic-unified-monistic view of life.

Thus, the present concept of the life-force is somewhat different from that of Aristotle's *entelecheia* or soul, that of Driesch's entelechy or vital-force, and also that of Bergson's *elan vital*. Concerning the role of the will in Lamarck's biophilosophical theory (Lamarck, 1809 / 1984), it seems notable for further research. However, his concept of the inheritance of acquired character lacks the background of the 8th-consciousness and the concept of individual-inheritance.

Chapter 20 A Possible Concept of Phylogeny: Neo-Evolutionism

I. Introduction

In last two chapters, two categories of ontogeny of life (individual development and inheritance), and new concepts of development (neo-Determinism) and of inheritance (neo-geneticism), are discussed. In this chapter, we suggest a new concept of evolution, neo-evolutionism.

Evolution is the major problem of phylogeny and inheritance is the basis of evolution. According to the concept of three life-elements (life-force /-energy /-material) or the two bases of life (noumo- and pheno-life, or positive- and negative-life), these lead to the new concepts of inheritance (two types / hierarchies of inheritance), and also lead to the new concepts of evolution (two types / hierarchies of evolution).

Darwin, Lamarck, Morgan, Dobzhansky, and other Western evolutionists all deal with the evolution of life as restricted on this earth. Here, we will try to integrate the Western evolutionary concepts with that of East, and deal with the universal evolution of life.

II. New Explanation of Evolution (1): Two Types of Evolution

1. Definition

Neo-evolutionism, as with neo-geneticism, has two types / hierarchies of evolution, that of familial-evolution and that of individual-evolution.

Familial-evolution refers to evolution taking place through familial-inheritance, which is the physical basis of familial-evolution. It may be said that familial-evolution is only the elongation of inheritance and an accumulation of the changes of heredity. Just like familial-inheritance, it is only a kind of conditional-inheritance and a pseudo-continuity between two life-times, and familial-evolution is also only a kind of conditional-evolution and a larger scale of pseudo-continuity, and it may be also called pseudo-evolution.

Individual-evolution refers evolution taking place by individual-inheritance, and is the energetic basis of individual-evolution. As with individual-inheritance, it is relatively true-inheritance and true-continuity, and individual-evolution is also relatively true-evolution and true-continuity, based on the true-continuity of the 8th-consciousness and the relatively true-evolution of its stored karma-seeds / *bijas*.

From the Buddhist point of view, the Darwinian theory of evolution can not be understand clearly, thoroughly, and completely unless its objectives are considered universally, and not pertaining only in this world. There is a belief that the category of living-beings in the universe are not restricted to human-beings and animals living on the earth, and holds that there may be total of ten kingdoms (or ways). This is comparable to what Buddhism states about the six ways of delusive-beings and the four ways of enlightened-beings. However, we here only deal with two of these ten, human and animal, to be dealt with, because the other can not be seen due to the limitation of the resolving power of our senses and discriminating abilities.

Therefore, it is asserted that if one wants to enlarge evolutionary research objects, it is most important to first enlarge (actually only recover) the resolving power and discriminating ability of one's subjective sensation, and not only to enlarge those of objective physical instruments. Otherwise, one can never reach true understanding of what is real.

One important concept of this study is necessary to explain here. The proposed both twofold systems of inheritance and evolution are not dualistic, because these two systems also pertain to the three-hierarchy theory of life described in Chapter 18. Both systems do not depend only on each other independently from the three-hierarchical system of life, but they are two parts of a triad. Familial-inheritance and -evolution pertain to the first hierarchy (physical) of life, and individual-inheritance and -evolution pertain to the second hierarchy (semi-material / energetical) of life.

These two hierarchical systems are only the phenomenal expressions of the third hierarchy (noumenal) of life. The third one is absolute noumenon, which has neither inheritance nor evolution. From the Buddhist point of view, the inheritance and evolution of delusive sentient-beings are originated from delusion and karma-force circulation. Only after enlightenment, from Sravaka through Bodhisattva to Buddha, the inheritance and evolution of the further transformation of consciousnesses into pure wisdom is from partially true to completely true. The type of these inheritance and evolution transfers into only one and straight.

Therefore, the twofold systems are only temporal and delusive phenomena. They are dynamic and can be potentially enlightened and transferred into one. This is the meaning of dialectic-unified-monism of life and is different from either Vitalism/Organicism/Reductionism or Idealism/Materialism/Dualism.

2. The Dynamic Power of Evolution and Teleology

In the Western world, since the times of Aristotle, many biophilosophers and other scientists have always believed that, in nature, even if there is no god, there does exist a special power directing the animate world, and even the inanimate world, toward a special goal. Since the times of Darwin, belief in this special power has been replaced by the concept of natural selection and concepts of this goal has been replaced by that of fitness / adaptation.

In the Eastern world, since the times of Fushi and Shakyamuni, these concepts of a special directive power and goal were not present. Biophilosophers, especially Buddhists, believe that there is, in nature, neither a special God, special power, or a special goal. If there is God, it is one's self-nature (or *dharmakaya* / *bhutatathata*); if there is special power, it is the power of one's own true-mind transformed in karma-force; and if there is special goal, it is the goal of evolution and retribution of karma-seeds / *bijas* created by one's own action stored in the 8th-consciousness directed by the law of cause and effect and expressed through conditioned-arising.

I think that although there exist some big differences between Eastern and Western concepts, they may be looked from different angles and there also exist some similarities. If these concepts are integrated and made complementary, then they can be understand more clearly, thoroughly, and completely. God may be understood corresponding to self-nature or *dharmakaya*; special power to the power of one's own true-mind transformed in karma-force, and special goals to the goal of evolution and retribution of karma-seeds / *bijas*.

3. Evolutionary Continuity and Discontinuity

Continuity and discontinuity were discussed in the last chapter on neo-geneticism, but only from the view of relatively short terms of time, past, present, and future life-times. We

now consider long terms of time, from the start of past, present, and future life-times until beginninglessness and endlessness. This includes not only the standpoint of a long term of time, but also a larger scale of space, or borderlessness, which extends from the earth to the whole universe.

According to the new concepts of the two categories of life (noumo-life and pheno-life) and three life-elements (life-force, life-energy, and life-material), noumo-life / life-force (the third hierarchical-life) belongs to the noumenon of life or true-mind and to the absolute realm. This latter has the character of being without borders, beginning, end, movement and without evolution. It is not in the purview of the present discussion. The emphasis here concerns the evolutionary concept of the second life hierarchy, i.e. the life-energy of the pheno-life. This belongs to the evolutionary category of individual-evolution as stated before. It also compares with the evolutionary category of familial-evolution.

True continuity in the universe is the noumo-life / life-force or the true-mind / *dharmakaya* / *bhutatathata*. Life-energy (the 8th-consciousness) and its stored karma-seeds / *bijas* are in the category of relative continuity. Individual-evolution belongs to this category, and is continuous, but only relatively. Life-material or physical-life is discontinuous, because all physical things have mass and form. These can always be divided: from things of the universe to that of the earth, into molecules, atoms, subatomical particles, to quanta / photons (or the smallest particle). The physical life of body is composed of earthly things and thus can be continuously divided. However, any things (including living things), which can be continuously divided, themselves are discontinuous. Even if they are phenotypically seemingly continuous, they actually belong to pseudo-continuous processes. Because the research objects of the Darwinian evolution pertain to life-material, their evolutionary changes phenotypically look continuous, but actually are only pseudo-continuous. Therefore, Darwinian evolution belongs to familial-evolutionary processes.

What is the basis of pseudo-continuity? Behind it, there is true (absolute)- or relative-continuity. This is the noumo-life / life-force (true-/ absolute-continuity) or life-energy / 8th-consciousness and karma-seeds (relative-continuity). True-continuity is like unmoving sea-water (equivalent to noumo-life / life-force), and the relative-continuity is like a wave (equivalent to the 8th-consciousness and karma-seed / force) caused by wind-blowing (condition). Pseudo-continuity is like flowing-oil (the series of living-things) on the surface of the water-wave. Therefore, it may be said that Darwin only saw the oil on the water-wave but did not penetrate the seemingly continuous oil wave to see the wave and also did not further penetrate the wave to see the ocean. Not only this applies to Darwin, but also to Mendel, Morgan, and all other modern mechanistic / reductionistic biophilosophers, who all have this deficiency. It is the common problem of Western mechanistic / reductionistic views of life.

4. Darwin's Missing-Links

In this view of continuity and discontinuity, Darwin's missing-link in the series of evolutionary processes can never be found. Because this is between two Darwinian continuous living-things, on any level, there are always further missing links on lower levels and they are always discontinuous. The so-called continuity of physical living-things is always an illusion, a pseudo-continuity but not true-continuity. From this perspective, the continuities of the Linnaean classification system, i.e. kingdom, class, order, family, genus, and species, and that of Darwin's evolutionary system, based on Linnaean system, are only illusory.

Therefore, we hold that Darwin's concepts belong to the concept of familial-evolution, but not to that of individual-evolution, which is relatively continuous. Evolutionary processes proceed and interact through both familial and the individual type of evolution. The former only acts as a condition for the expression of the latter.

5. The Origin of Life on the Earth

Concerning the origin of life on the earth, modern molecular evolutionary theory has suggested the hypothesis of the origin of DNA molecules. However, it can not be thought of as the solution of this riddle. It proposed about the origin of the natural biochemical synthesis of DNA molecules, but it does not explain how could it acquired the ability of self-replication. It is more far from the solution of the origin of life on the earth. It may be said that Mechanism / Reductionism is very difficult to solve this problem, because it can only see the oil on the surface, but does not see the oil being on the water-wave.

In our view of three hierarchies of life, the origin of the DNA is caused, under necessary conditions, by the common-karma-force of the 8th-consciousnesses of all living-things on this earth. In the earliest times of the earth, DNA molecules were not yet integrated by the 8th-consciousness, and they could only be called organic-chemical-compounds. Until the living conditions “matured”, the 8th-consciousnesses of the lower animals began to integrate with the nucleic-acid-proteins, to produce the lower animals with their physical bodies. As living conditions gradually improved, the different levels of advanced animals also gradually appeared.

A very important view to be pointed out here is that every living-being at a given time possesses its own independent individuality / personality, because the 8th-consciousness and its karma-seeds are specific and independent and can not be mixed or fused with those of others’. This is the unique order of nature. In this sense, one individual or living-being can not essentially produce another new individual or life.

The phenomenon of parents in bearing their offspring does not truly generate new life, because the 8th-consciousness of the offspring is continuous and pre-exists before birth. Parents are only the conditions for the birth of their children, and their children possess their own independent 8th-consciousnesses apart from the karma-forces of their parents. In this

sense, the similarities or dissimilarities with their parents are caused by the similarities or dissimilarities of their common-karma-seeds with their parents.

Therefore, essentially to say, life is naturally and inherently existent, and is without origin. The idea of the origin of life is only an illusion, and one might better say that it is the appearance or reappearance of the physical body. Life-force or life-energy is always continuously existent and not effected by the phenomena of birth or death, which are only illusions. Birth and death are only of the physical body, because it is made from material, which is discontinuous and therefore must be governed by the phenomena of birth and death.

Concerning inheritable genetic mutation, although Western modern genetics can use experiment under the influence of artificial strong factors, such as the presence of radiation or chemicals, to induce and prove its existence, the nature of many natural mutations are still unknown. This can be reasonably explained as the influence of related karma-forces and then changed the conditions for the expressions of other karma-seeds.

Therefore, concerning familial-evolution, the evolutionary speciation-factors of neo-Darwinism, i.e. mutation, selection, adaptation and isolation, only belong to conditions for the processing of the individual-evolution.

III. New Explanation of Evolution (2): Universality of Evolution

1. The Classification of Life-Category

In Western systematics of living-things, the largest classification unit of Linnaean system is kingdom. This system proposes that there are two kingdoms, the animal and the

plant. However, there are at least five kingdoms now accepted by biologists. Because plants do not possess eight consciousnesses, especially the 8th, they have neither thoughts nor sensations. Thus, the plant kingdom is not emphasized here. In the animal kingdom, human-beings are only one species out of almost five hundred thousands of earthly animal species. From the consideration of Buddhist theories, this classification is not viewed as cogent, in light of the importance of human-beings in comparison with the other animals.

The universe is a whole, and the earth is only a very small part of it. To consider the evolution and classification of life-categories on the earth, one must connect it to the whole universe. If considerations are only restricted on the earth, they are incomplete.

The Buddhist classification system possesses this reasonable characteristic. It classifies all kinds of living-beings in the universe into ten different ways (realms, somewhat similar to kingdom), in which four systems are enlightened and six are deluded (cf. Figs.3-1, 3-2 & 15-1). In the six deluded ways of this system, the classification position of human-beings is parallel to that of animals. However, from the view of importance, the way of the human is the most important one out of the six, although from the view of species diversity, it is the least. The criteria of the classifications of these different ways have been discussed in Part I and not repeated here.

2. The Power and Types of Evolution

In the definition of neo-evolutionism, there are two types (just as with inheritance): the familial and the individual. The Darwinian evolution belongs to the familial-evolution type. Concerning the direction of evolution, there are also two types, the straight and the circular. Darwinian evolution mainly acts in a straight way, and the power of this type of evolution is the natural selection.

However, the individual-evolution direction of the 8th-consciousness of six deluded ways evolves in the type of six circular-transmigration-ways. The evolutionary power and direction of this type of evolution act in neither an orderly or random fashion, acting solely by the nature of the karma-forces / seeds of the 8th-consciousness. Therefore, both the evolutionary power and direction of Darwinian familial-evolution do not act in the same way as in individual-evolution, and only represents the sequence of the appearance of different species on the earth.

3. The Universal Evolution

In the discussion of ontogenesis, we have described the small circulation of positive and negative two life types. From the viewpoint of universal phylogenesis of living-beings, there also is a bigger circulation of six-ways. Because there exist universally two basic categories of living-beings, the delusive and the enlightened as stated above. The evolutionary directions and types of these two different basic categories of living-beings are different. The delusive is circular and the enlightened is straight. The borderline of the two is the condition of enlightenment. This whole universal evolutionary system can be shown in Fig. 20-1.

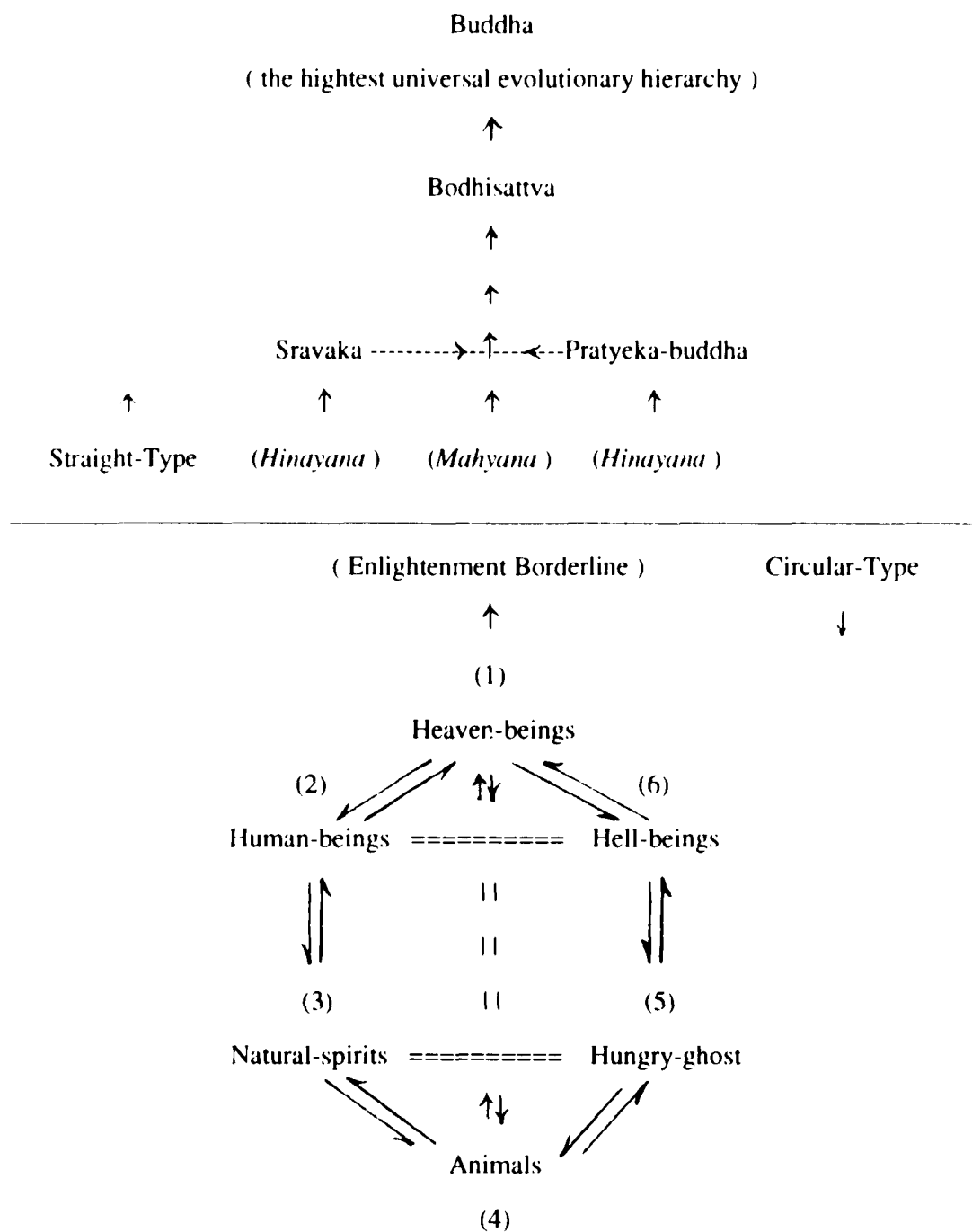


Fig. 70 Universal Evolutionary Directions and Types of All Living-Beings

4. The Key of the Universal Evolution

In the above universal evolutionary system, there is a key which determines evolutionary directions and types, and that is delusion or enlightenment. If the living-beings are in delusive condition, their evolutionary direction or type is circular. These living-beings evolve up and down in the circulation of six-ways (realms or categories), and their evolutionary directions are completely determined by the power of their own karma-force caused by delusion (without any action of super-power or special goal). If the living-beings attain, or are in an enlightened condition, their evolutionary direction or type is straight. These living-beings evolve only upward and no longer downward until they reach the highest hierarchy of Buddhahood (completely enlightened). There are two rules which determine these situations.

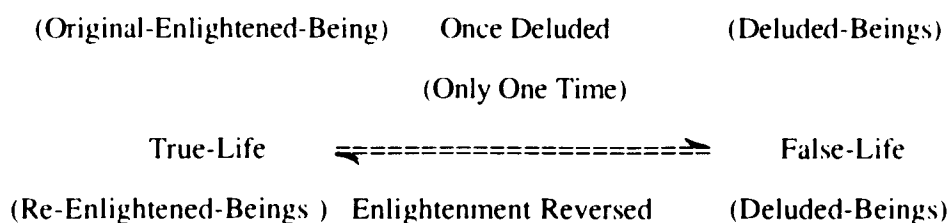
4.1 The Rule of Reversibility of Delusion

As mentioned above, the key of the six-way circular evolution (transmigration) of delusive-beings is delusion. The condition for transferring from the circular type into straight type is to transfer the delusive state into enlightened one. Is this kind of transformation possible ? Shakyamuni is the first one to prove that it is possible, and there were also many followers / practioners to repeatedly prove this rule. The basis of this rule is that the false-life or pheno-life of delusive-beings is in a movie-like fleeting delusion, and it does not possess its own entity, or noumotype and shares the same noumenon with true-life. Therefore, once delusion is removed, then true-life can be reversed, recovered or enlightened.

According to Buddhist theory, long long time ago (almost infinitely early and being able to say as beginningless), a constant number of beings (numerously almost being able to say as numberless) were originally in the enlightened situation. Once, they were deluded by and attached on the ignorance, which also existed as early as the enlightened-beings. Thus, the six-

ways of transmigration started. Why the number of ways are six but not the other is unknown before attaining completely enlightened. Thereafter, someone discovered that the delusion is caused by the ignorance and it can be removed away to reverse back to the original enlightened situation. Shakyamuni is one of the numerous re-enlightened persons, who was taught by other re-unlightened ones. Therefore, everyone attaining enlightenment today belongs to re-enlightenment.

This process can be summarized as the following equation:



Fortunately, this equation is reversible. Because of this, the possibility exists for all sentient-beings to reach enlightenment. Furthermore, this reversibility is only once; thus, once enlightened, one will never delude and reverse back again. This may be the favor of nature.

From the standpoint of delusive sentient-beings, enlightenment means reduction, reducing from delusion to enlightenment. In this sense, Buddhism in its essence was an early Eastern paradigm of Reductionism. False-life is, therefore, rooted on true-life, and can not be independent of it. Though delusive-beings are deluded, they still have the potential to be enlightened. When one's false-life is reduced to true-life, one attains enlightenment and becomes an enlightener. The nature gives equal potentiality to every one to gain enlightenment, life-liberation, or true-freedom.

4.2 Three Time-Rules of Evolution

From the characteristics of the above reversibility-equation, the other three evolutionary time-rules can be deduced as follows and shown in Fig.71.

(1) *Beginningless-Endless Rule* means neither beginning nor end. This is the characteristic only for noumo- / true-life, self-real-nature, pure- / true-mind, or *bhutatahata*. It exists naturally and originally.

(2) *Beginningless-Endness Rule* applies when there is no beginning, but there is an end. This is the characteristic for delusion. Delusion exists naturally, originally and beginninglessly. However, once one is enlightened, it stops.

(3) *Beginningness-Endless Rule* means that there is a beginning but no end. This is the characteristic for enlightenment. Enlightenment has a beginning and comes from learning and practicing, but it is endless. This means that once one enlightens then never deludes again.

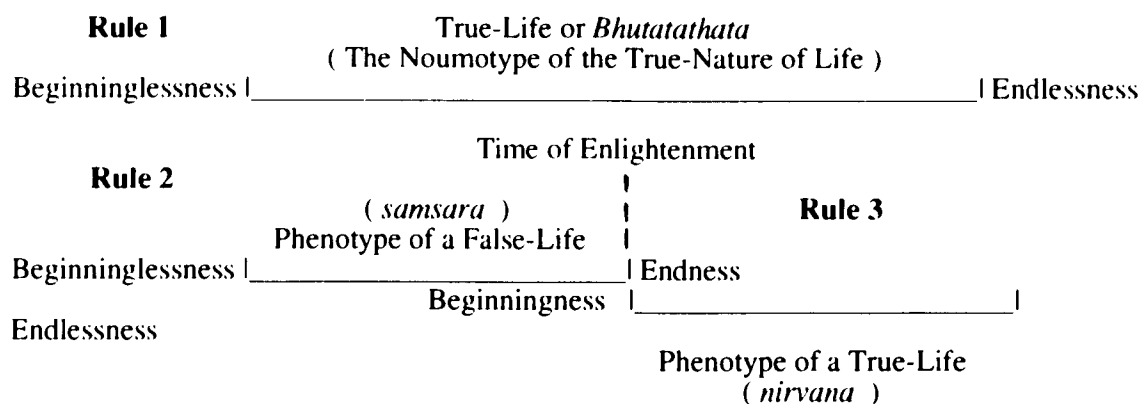


Fig. 71 Illustration of Three Time-Rules in the Universal Evolution

5. The Origin of Human-Beings on the Earth

The central problems in phylogeny are evolution and transmigration. Since the theory of evolution raised by Charles Darwin in 1859 and neo-Darwinism was established in the first half of this century, the problem of evolution seemed to have been basically solved, but actually it is far from solution, especially concerning the origin of human-beings on the earth.

The evolutionary process seems continuous, but it only pertains to pseudo-continuity. Thus, Darwin's missing-link between anthropoid-ape and man can never be found. The Buddhist sutra, *The Origination of the World Sutra*, prefers to believe that human-beings do not originate from animals but from other beings from other planet.

In whole, Darwinian evolution is only a familial phenomenon, but not the true nature of individual life transmigration, which is not mainly determined by the living conditions of a living-being but by its own life-activities and karma-forces. These life-activities mean, directly or indirectly, the activity of consciousnesses or life-energy. Living conditions are only the conditions for the expression of life-activity-production, i.e. karma-force, which is the direct dynamic force to cause the individual life transmigration, namely, the transformation of life-types.

In this kind of view, it is thought that the role, in the process of evolution concerning Lamarck's concept of willing, is worthy for further research.

Summation and Concluding Remarks

In Part I, Eastern biophilosophical theories, mainly the Buddhist theories, and in Part II, that of the West, were introduced and discussed. In Part III, the preliminary comparisons, complements, and syntheses of that of both the East and the West were tried; and several new ideas of biophilosophical theories have been suggested for further exploration. It is now to make some brief summations and concluding remarks as follows.

I. The Summation of This Study

1. The Summation of Part I

The first part introduces some major ideas of biophilosophical theories in the East. The emphasis is put on Buddhism, because it is considered that Buddhism is the broadest and deepest one which discussed about biophilosophical problems in all of the ancient biophilosophies, and that Zen Buddhism provides the most effective approaches to practice and reach the final realm of true life, the enlightened life.

On the basis of Buddhism, the major biophilosophical ideas of Taoism and Confucianism, which shared their origin in the basic ideas of Fushi's *I-Ching* or *The Book of Changes*, have also been touched. These ideas, especially the Taoist notions, are very similar and in harmony with Buddhism. Thus, to some extent, they have been integrated and synthesized to produce two products: Chinese Zen, which inclines to Buddhism, and Chinese Rationalism / Mindology, which inclines to Confucianism and Taoism.

According to Suzuki (1969), Zen essentially originated in China (Layman, 1976, p.55). From this point of view, it may be said that, in some extent, Zen is the integration and synthesis of both Buddhism and Chinese biophilosophical theories, especially Taoism. However, it certainly more inclines to Buddhism.

There are seven essential and significant contributions of Eastern biophilosophies, which are not present in Western thoughts:

- (1) the existence of the absolute noumenon of the universe and life;
- (2) the wholeness and unity of the universe and life --- the universe is actually transformed from the true-life, so they share the same noumenon;
- (3) the two types of truth: the absolute and the relative, and the latter originated from the former;
- (4) the two types of life: the true and the false, the latter with birth-death and the former out of this, which is considered as a continuum of discontinuity based on the former and so the latter being able to transform back into the former;
- (5) before transforming back to the pure objective wisdom, the realization of objective things by consciousness being false, and only the pure objective wisdom to be able to realize the reality / true-nature of the universe and life;
- (6) the mental verification practice approaches for attaining enlightenment and for transforming false consciousness back to the pure objective wisdom; and
- (7) these practice approaches to be able to integrate with daily life and social affairs.

The complement and integration of three major Eastern biophilosophical theories may be considered as the preprocess of the next step for the complement and integration of Eastern and Western biophilosophical theories.

2. The Summation of Part II

The second part introduces some major ideas of Western biophilosophical theories. The emphasis is put on Aristotle's and Driesch's Vitalism and Needham's Organicism, because it is considered that Aristotle's and Driesch's vitalistic ideas, especially the former, were the major biophilosophical ideas in the West, and that Needham's Organicism was intended to integrate and synthesize the ideas of both Vitalism and Mechanism.

Needham had also done some preliminary work concerning the integration and synthesis of Eastern and Western biophilosophical ideas in his book, *Science and Civilisation in China*, though this was not his main emphases.

The modern mechanistic biophilosophical ideas, such as Reductionism, will also be considered from the viewpoint of reduction of the physical relative pheno-world to the mental absolute noumo-world, and reciprocally from the noumo-world back to the pheno-world. Two significant characteristics of Western biophilosophies are: the existence of the mind / body issue and the continuous arguments from ancient Greece till to the present time between the two opposite theories, Vitalism and Mechanism. These do not exist in Eastern biophilosophy. It can be said that this is due to the obscure of the concept of an absolute noumenon, in Western biophilosophy, to unify the mind and body / material.

Therefore, the West does not know what kind of agency connects the mind and body. With respect to the second characteristic, one group inclines toward or emphasizes the mind (actually the false mind) to claim Idealism or Vitalism, and another inclines toward or emphasizes the material to claim Materialism or Mechanism / Reductionism.

The resolution of these two problems, in Western biophilosophy, can be solved by complement and integration with Eastern biophilosophical theories. This is the goal of this study. Although there are no unified basic ideas as a whole to use to summarize Western biophilosophical theories, these can be made according to each individual theory.

Firstly, there are five major groups of concepts in Vitalism: (1) the concepts of potentiality and actuality to bring the abstract idea “*ousia*” into actuality; (2) the concepts of soul (Aristotle’s) and of vital-force (Driesch’s) as a dynamic agency of life; (3) the concept of hierarchy: the classification of the types of soul --- rational (human), animal, and plant; and the differentiation of the functions of soul --- five sensations; (4) the concept of the inheritance of soul; (5) the concepts of autonomy, harmony, regulation, morphogenesis, and equilibrium (Driesch’s).

Secondly, there are four major basic concepts in Organicism: (1) the concepts of organism and organization of the universe and life; (2) the concepts of hierarchy, development, and morphogenesis (derived from Vitalism); (3) the concept of materialized morphogenetic inducer or organizer; and (4) the concept of morphogenetic field.

Thirdly, there are also four major basic concepts in Reductionism: (1) the concept of the reducibility of the organization of life from the higher (such as individual) to the lower (such as molecular or atomic) level; (2) the concept of the reducibility of biology to more basic physical sciences, physics and chemistry; (3) the concepts of self-replication and regulation of genes; (4) the concepts of code, information, and expression.

3. The Summation of Part III

On the basis of the first and second parts of the introduction of both Eastern and Western biophilosophical ideas, the third part has made some comparisons, complements, and integrations between Eastern and Western biophilosophical ideas. Based on this step, then a preliminarily synthesized new hypothesis or approach of the conception of life has been

suggested. This has basically integrated both Eastern and Western, ancient and modern, theoretical and practical, physical and mental, relative and absolute truths of life. It is called *Bio-Meanism --- A dialectical bioenergetic information approach / a dialectic-unified-monistic field system of life.*

There are ten major concepts of this approach / system.

(1) There exists a life-force as the absolute noumenon of both life and universe.

(2) This life-force possesses a totipotentiality and is equivalent to pure mind with its pure objective wisdom.

(3) It is the origin of the pheno-life and the pheno-world; from it, the phenomenal / relative level of life-energy, bio-energy and universe-energy is transformed.

(4) This life-force-energy system is absolutely conservative and there are actually no birth / production and no death / annihilation; the phenomena of the birth-death of life is only the phenomenal transformation of this system, but the essential nature of transformation / changing is that it is actually not transforming / changing.

(5) This life-force / noumo-life is never born nor dies, and the discontinuity of the birth-death of pheno-life / living-beings is actually the continuity of periodical-life-stream / -continuum.

(6) Life-energy transforms mentally and physically into conscious-sensational-nervous and genetical-generative-informational system, and the bio-energy / universe-energy transforms into Chi (Qi) system and in turn reforms / organizes the existing organic and inorganic material

to build up the physical body according to the genetic- information / -seeds (*bijas*) stored in the life-energetic-pool / life-gene-pool (the processes of development and morphogenesis).

(7) During the living process, the life-force / pure mind of living-beings acts with and responses to the stimulation of their living world; due to the ignorance, adhesion, and greed, the life- / mind-force transforms into life-energy which transforms into bio-energy and universe-energy again. In this transforming process, the individual activity-characteristics transform into genetic-information to be stored in the life-energetic-pool and characterized by particular wave-frequencies (the process of inheritance).

(8) This life-force possesses only functions (potentiality) but no form (neither wave nor any types of forms), and the three types of energy mentioned above possess the form of wave (semi-form or semi-material); therefore, they only can be felt but cannot be seen directly.

(9) The life and its living world / universe are actually in one unity / one wholeness; the life-force-energy-material system as well as the mind-body-material system all exist in a large unified system, a transformation system, of circulation, and they can transform each other reversibly. The mind (false mind or consciousness), body and material are not independent each other; and each one is only a particular stage of the expression of the development / transformation process of the life-force. On the other hand, the expression of life-force must be conditioned by energy and / or material.

(10) Both Vitalism and Mechanism / Reductionism or Idealism and Materialism are all incomplete and cannot be independent each other.

The aim of this study is to complement and integrate two modern Western biophilosophical characteristics, the analysis and the testing by equipment and experiment, with Eastern biophilosophy. By this way, some attempts have been made to try to solve two basic problems in Western biophilosophy: the mind-body problem and the opposite viewpoints of Vitalism and Mechanism / Reductionism.

Two basic characteristics of Eastern biophilosophy, namely, the mental verification (not only the physical) and the practice integrating with daily life and social affairs (not only in the laboratory, including both the salvation of health problems and of the rebirth problem), have also tried to introduce into and integrate with Western biophilosophy.

II. Concluding Remarks

1. The Value of Life

What is the meaning and value of human life, how could one attain enlightenment to reverse or recover one's original noumo- / true-life, and to obtain the thorough liberation of life, out of rebirth and suffering ? It is thought that these are really very radical and important biological problems and are new issues for Western academic fields rather than religion. For explaining these questions, we have suggested two *Delusion-Enlightenment Life Equations* in Chapter 17, and here another equation can be further suggested.

$$\text{Human Life} = \text{Physical Life} + \text{Spiritual Life} \quad (1)$$

Western culture relatively more emphasizes physical life and physical sciences develop relatively rapidly; and thus, physical life, major in the modern time, is solved better than the East. In contrast, Eastern culture relatively more emphasizes spiritual life, and it is solved better than the West, major in the ancient time; thus, physical sciences are not well developed. However, the physical life seems dominant to spiritual one. Therefore, Eastern spiritual life is gradually depressed by Western physical life in the modern times.

According to our point of view, both Eastern ancient and Western modern situations are all non-equilibrium situations, as indicated by the two following equations (2) & (3):

$$\begin{array}{ccc} x & & x \\ \text{Human Life} == \text{Spiritual Life (2)} & \text{or} & \text{Human Life} == \text{Physical Life (3)} \end{array}$$

Therefore, we claim that the ancient Eastern spiritual life needs to be recovered and to get harmonization with the Western modern physical life, and that only the life equation (1) is the true-life, in which both problems of physical and spiritual life are solved and harmonized.

2. The Second Renaissance of Human Thoughts

It has been claimed before that the developmental direction of Eastern culture is mainly upward on inward, and that of the West is in *vice versa*, i.e. downward or outward. Although these seemingly belong to two opposite directions and contradict each other, according to the dialectical viewpoint, they can further develop and will ultimately merge together. This is because whether the development is in the upward direction or that of the downward, they have the same root or noumenon.

This is the theoretical reason of this study and such merging process, in my Masters Degree thesis, was called the second movement of Renaissance (Cai, 1990). It means the integration, complement and synthesis of both Eastern and Western cultures, philosophies / biophilosophies, to form a complete human culture.

Interestingly, Dalai Lama and Thurman (1991) and Sheldrake (1991) also announced similar view, independently. This second Renaissance movement will mainly develop what may be called wisdom sciences, which will be a major developing direction in the 21th century and toward a more complete science (Harman, 1991; O'Leary, 1992).

This movement is suggested that the basis of Western biosciences and biophilosophies can be simultaneously developed in two directions, upward and downward, or inner and outer.

Firstly, in the upward direction, it needs to transcend (but not deny) both physical and life-material corpuscular conceptions of Watson and Crick, Morgan and Dobzhansky, Charles Darwin and Issac Newton. Although Albert Einstein had broken through the concept of corpuscular mass, he did not break through and transcend the concept of relativity and still stayed in the relative-world.

Although the concepts of *eidos*, *logos*, and *dynamis* of Socrates, Plato, and Aristotle transcended the relative-world, they are still staying in the abstract-world. Therefore, they all need to transcend into the absolute-realm, and then to meet the Eastern concepts of true-life, the Buddhist concept of self-nature or *Bhutatathata*, and the Taoist and Confucian concept of Chi-Reason.

Secondly, in the downward direction, there might exist two ways:

(1) The first one may start from molecular biology further going down to explore the original forces of the divisions of cells, chromosomes, centromeres, and the replicators of

DNA. It needs here to distinguish between two different things: the automatic / dynamic capability and the necessary amount of energy (in terms of ATP).

My interests are that what is the origin of the automatic / dynamic capability of divisions but not in the amount of energy. It is also concerned that whether when the molecules of DNA can further reduce down to their composition of relevant atoms, nucleus, protons, neutrons, quarks, electrons, and photons, they still maintain the capability of automatic replication and the genetic code of information. The answer may be negative, but may also be positive if this question is considered by connection with Eastern ideas.

(2) The second one may start from quantum physics further going down to explore the meanings of transformation between basic particles and energy, or the Einstein's formula: $E = MC^2$, the nature of particle-wave duality, and the real cause of Heisenberg's quantum uncertainty principle. Although Einstein developed this formula and he knew that the form of matter can be transformed into formless energy, he did not enter into any realm of absoluteness and only stayed in the realm of relativity.

However, some of theoretical physicists have begun to know that the transformation of mass and energy and the behavior of quantum uncertainty can be connected with the emptiness of Buddhism (Capra, 1975; Zukav, 1979; and Mansfield, 1989, 1990). In recent years, some molecular biologists and biophysicists have also tried to connect the basic life / genetic material, DNA molecules, with quantum particles (Popp, et al., 1989; Peat, 1991b).

It was discovered that DNA molecules may be giving off a very weak level of radiation, just a few photons at one time and to be acting like a laser and producing collective vibrations in an electromagnetic field. It is very interesting that Peat (1991b, p.26) said:

Scientists are also looking at coherent radiation from individual cells. The idea is that the entire organism may be swimming in a "living", vibrating electromagnetic field. It may turn out, for example, that coherent light is being used as a communication system

throughout the whole plant or animal --- between DNA and cell, between cell and cell, and between organ and organ. The entire organism may be a complex flow of information in which each cell and organ is responding to a constant flux of electromagnetic messages.

From these newly developed ideas, we can make some further conjectures that the information, which comes from DNA vibration and photon radiation, can be connected to the mind / body electromagnetic field and the information flow of Chi, karma-force, or karma-“seed” stored in the 8th consciousness, which is differentiated from the true-mind. Thus from this, the DNA information can be further reduced to and connected with the emptiness or *bhutatathata*. Since Buddhist emptiness is actually equivalent to the true-mind or true-life. Therefore, the downward direction can also meet the Eastern concepts of Wu-Ji, Chi-reason, *bhutatathata*, and noumo-life (or true-mind / true-life).

Furthermore, according to the *Surangama Sutra* or *Leng Yen Ching* (Luk, tr., 1966), if the border-form of matter, the “mote-near-void”, undergoes further splitting, then it vanishes into the nature of true-void or emptiness, which is actually equivalent to the noumenon of true-life.

The *Surangama Sutra* said (p.73, translation with some changes):

Look at the element of earth which ranges in size from the great earth to a tiny-duet, then to the finest-speck, and finally to the mote-near-void, which obtains from seven times of splitting the finest-speck on the extreme border-form. If further split the mote-near-void, then it becomes the nature of true-void.

This fact was said about 2500 years ago. It is very interesting to see that here the “mote-near-void” may be said to be equivalent to the quantum particles, i.e. quarks, electron, and photons in modern Western physics. However, the purpose of reduction is different between the East and the West: the former is to transcend the form of mass and to enter into the realm of formless absoluteness, the domain of true-life; but the latter not.

Therefore, it is convincible that either the path of upward direction or downward direction can all meet together in: the realm of absolute emptiness or *bhutatathata*, the noumenon. Because the words “upward” and “downward” are only of relative meaning, both the matter and the false-mind have eventually the same origin of noumenon (true-mind / noumo-life).

Thus, I would like to say that either idealistic, materialistic or dualistic concept is disastrous to separate life into the matter and the mind as two absolute different things. It would be considered that mind (including consciousnesses and psycho-karma-seeds) and matter (including physical particles and genes) are not different two things but only two developmental dynamic aspects of one life-force or noumo-life, just like the waves of water. Attachment to any side is incorrect and one has to hold the concept roundly, dialectically, and perfectly. The purpose of the second Renaissance are supposedly to establish a complete human culture: a neither idealistic, materialistic nor dualistic biophilosophy, to completely solve the human life problem.

It is thought that these are really very radical and important biological problems and are new things for Western academic fields rather than religion.

Now, modern physics has already gone ahead and touched these problems. Although Sattler (1986) has touched something about this, modern biological sciences and biophilosophies have not done much about these problems integrated with the basic Eastern concept of life. The present study attempts to contribute something to this.

Appendices



Apx. 1 Dr. Th.H. Morgan (left, the Founder of Modern Genetics) with His Last Chinese Ph.D. Student C.C. Tan at C.I.T. in 1935 (after Tan, 1987).



Apx. 2 Dr. C.C. Tan (right) with this Author in New York in 1990. Dr.Tan is the Current Foreign Academician of the US Academy of Natural Sciences and the Author's Genetics Advisor in China

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