

**Self-forming Structure of Nature & Man, and
Human Recognition of Environment:**

**Inquiring into the foundation of environmental
ethics and environmental education**

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I Introduction

We would like to deal with self-forming structure of nature and man which have almost the same environmental roots in the dimensions of space and time. But we tend to forget such fact so completely that we humans have caused great destruction in the global environment.

We want to proceed with this paper in four parts as follows. First, we will observe self-forming structure of nature and man formed by the nest-web connection of self-formation which is characteristic of ecological system. Second, we will consider a strategy for a new system theory of self-organicity. Third, we will inquire into human recognition of environment, observing the structure of the human mind, widened human recognition of the Ecological-I, and its application in seeking solutions to environmental issues. Fourth, we will show practical cases of environmental destruction in Japan, such as Minamata disease, deformed Japanese monkeys and environmental hormones, being applied by the self-forming explanation or self-organizing theory.

In conclusion, environmental ethics based on self-organicity theory or ecosystem should be constructed with widened human recognition, or from an eco-centered perspective, not with narrow human-centered recognition, or from an Ego-I centered perspective, because a human-centered recognition has destroyed the earth environment. Therefore, environmental ethics based on an eco-centered perspective should be actualized in environmental education in order to realize sustainable development.

II Self-forming structure of nature and man

First of all, we would like to focus attention on the common essence of self-forming explanations in short.

(1) Nature formed by self-formation in the dimension of space

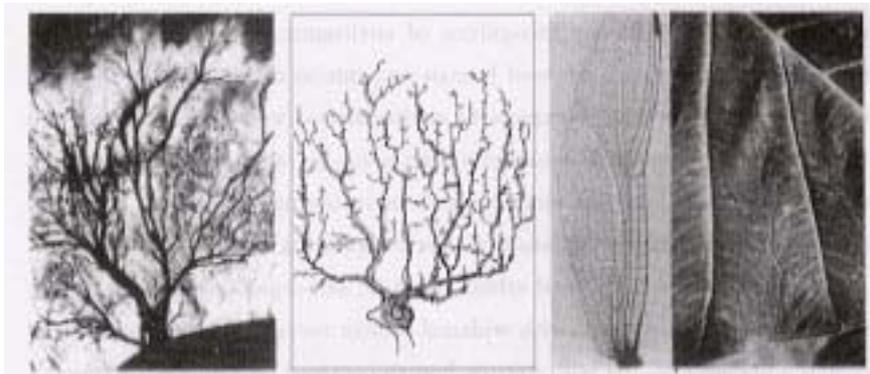
From the beginning of the universe, there has worked a force to create the shapes of things

through the spiral process of forming, maintaining and disappearing with fluctuation and entrainment as told by Herakleitos, “panta rhei”. While automatical moving is continuing, some stable structure is formed.

This is a prototype of self-formation or self-organity. It forms the same shapes in every natural environment just as a set of boxes may be nested in space.

For instance, the shape of streams of a river in the mountains (picture (i): shape of Colorado River in U.S.), that of the net of capillaries in the body (picture (ii): nerve tissue) and that of the veins of an insect and a leaf (picture (iii)), all these things resemble each other.

Therefore, we can find a condensed structure of nest-web connection in each level of natural structure and life in the dimension of space. And this connected structure forms ecological systems. From this point we come to know that in the outer world of space, if we destroy the outer environment, the destroyed environment revenges the destroyer in turn. For nature is founded on the ecological system where self-recurrent mechanism works in nest-web connections.



Picture (i): Colorado River seen from high altitude Picture (ii): nerve tissue in the body Picture (iii): veins of a dragonfly and a leaf

(2) Man formed by self-formation in the dimension of time

From the birth of life, around 4 billion years have passed. When one person is born, he or she has experienced the history of life of 4 billion years in his or her mother's womb (picture (iv): 8 weeks' fetus with webbed hands and feet, 13 weeks', 23 weeks', look at these growing hands and feet). As E. H. Haeckel asserted, “Ontogeny repeats phylogenesis”. Such a repetition of the human life-history forms through self-formation a condensation like a set of nesting boxes in time.

All lives have such backgrounds in the inner environment and these lives make themselves through self-forming mechanism in time.

This means that the environment of human life in the dimension of time has the same root as other shapes of life in the natural environment in the dimension of space. And we can know that only one ecological system operates in the dimension of space and time at one time.

Therefore, if we try to understand the self-forming phenomenon in the structure of nature and man, a new system theory such as self-organicity, which differs from traditional recognition, is postulated.



8 weeks

13 weeks

23 weeks

picture (iv) : pregnancy

III Strategy of a new system theory of self-organicity

As far as self-forming system is concerned, General System Theory by L. von Bertalanffy, Dissipative Structure by I. Prigogine, Synergetics by H. Haken, and Autopoiesis by H. R. Maturana and F. J. Varela have gradually been admitted recently. They are all based on some kind of system theory, but their theories are not consistent with each other, though they try to go beyond traditional thinking of dualism and reductionism based on formal logic, and to make a new system theory to understand self-forming structure.

(1) Traditional recognition and its limits

1) traditional criterion of recognition

The traditional criterion of recognition is based on the conformity of subjectivity with objectivity, but it can only analyze a static object, not a dynamic one such as an ecological circulation. For instance, traditional analysis depends upon formal logic according to laws of identification, contradiction and excluded middle, which eliminates time and mutual dynamism between subject (life) and object (environment) in the real world. If we try to analyze the changing world by formal logic, we will necessarily fall into dualism, and, consequently, into reductionism.

As for traditional criterion of recognition, object is supposed to be true because of its stability, whereas subject is regarded as fallible because of its instability, and so we rely upon objectivity

rather than subjectivity. As a result, the criterion of recognition or truth must rest upon the necessity of conformity of subjectivity with objectivity.

And also, as for environmental issues, the subject, the human being, becomes more important than nature as inorganic substances, so that the human being who acts from a human-centered recognition has destroyed nature.

This emphasis of one sided value or viewpoint is derived from a result of dualism. Dichotomy by dualism originally creates relative values, not absolute values. But now that such traditional criterion of truth have become established, we are apt to perceive and grasp one sided value.

And as far as reductionism is concerned, we resolve an organic system into many static parts with dualistic analysis and after that we try to put them together into a whole system. It is true as Aristotle said that a living whole system doesn't consist of a totality of parts. As it is, this way of reductionism by no means represents living organicity.

Thus, it is obvious that traditional recognition is limited.

2) new concepts needed beyond dualism such as cause and effect etc. and reductionism

The first question we have to deal with is the problem of dualism. Self-organicity theory should be constructed by new terms of thinking which go beyond dualisms such as cause and effect, subject and object, human being and nature, self and others, inner world and outer world, and so on. In fact, dualistic factors are closely related and always influence each other. For example, if we, and our lives, affect the environment, then the affected environment is transformed and affects us directly in turn.

In this case both contrary factors are, as it were, the same thing and we cannot distinguish which is which. This is because if we take time into account, far from the traditional static recognition, "past affecting" subject toward affected object becomes "present affected" subject by "past affected-present affecting" object owing to mutual interaction in the recurrent circulation in due course of time. It means past affecting subject was a cause and past affected object was an effect, but in due course of time, affecting subject (past cause) becomes affected subject (present effect) and affected object (past effect) becomes affecting object (present cause) in turn.

In such a way the past cause (affecting subject) become the present effect (affected subject) in the process of time. But in static terms we can not help but fall into a contradiction for the reason that they literally express that cause is effect. As a result, we need new terms which can express contrary meanings in a word such as in Eastern thought.

Consequently, both sides of dualistic factors are head and tail of the same coin.

The next question is the idea of reductionism. We should examine the relationship between the part and the whole, which is derived from dualism.

We would like to examine the words "part" and "whole", because these terms are

fundamental for organic systems. In a whole biological system, for example, on one side a cell as a part is working independently from a tissue which is a whole against the cell, and on the other side the tissue as a part is working independently from an organ which is a whole against the tissue. We can understand two meanings from this case. One is that if we pay attention to the concept of the tissue, the tissue is a whole against a cell and at the same time a part against an organ. Thus, the concept of the tissue involves two contrary meanings in one term; that a whole is a part, or a part is a whole, by means of considering diversity of different relationships. Terminologically it is a contradiction, in reality however, it is not functionally contradictory.

In this case we can not grasp the whole fact exactly by reductionist concepts, which have been used by modern science.

Consequently, we have to grasp the forming phenomenon through a systematic way beyond dualism and reductionism. Because one term involves two contrary meanings from various relationships of position, yet the function contains no contradiction owing to the time process in the dynamic, mutually acting, real world.

3) approach from Eastern thought

This terminologically contradictory phenomenon is well explained by Eastern thought such as in Zen Buddhism or Kitaro Nishida's philosophy in Japan. According to Nishida, a whole is a part in the sense that one is diversity, or continuity is the same as non-continuity, or a contradiction is described as self-identity according to an absolute contradiction.

This logic according to Eastern thought is very akin to self-formation or self-organicity logic except for the time factor. Functionally a real phenomenon in this world, living environment, is founded on the time process. Logically taking a look at the phenomenon, it seems contradictory, because, whenever we analyze the object, we must make it static from the standpoint of an observer, and after analysis we compose the parts or components into a total whole from the result of reductive observation instead of grasping whole the dynamic phenomenon. However, new terms such as Eastern thought based on a new recognition apart from the traditional one must be located in the middle where dualism can not clarify.

Accordingly, the approach from Eastern thought must be made available to express organic systems or the living environment.

Whenever we use words, we are apt to fall into a contradiction of dualism and reductionism from the nature of language. But if we get accustomed to Eastern thought and logic, we could make progress to express reality from the other side as an “observer” who has the competence to grasp reality, being outside the system just for reflection. This reflective observer is an important concept in systematic thinking, and Eastern thought provides a significant suggestion for an observer, even though he stands on static position outside the system which means that he is one of the components of the dynamic system but at the same time is apart from the system in order to reflect.

Therefore, we can not depend upon traditional criterion of recognition derived from dualism and reductionism without the time factor, but we must develop new thinking which can deal with ecosystem accompanied by circulating self-recurrence.

(2) Characteristic of self-organicity theory

As stated above, if we endeavor to understand the mechanism of ecological system, we have to clarify the theory of self-organicity. The theory of self-organicity is a devised self-forming explanation and a new system theory which is beyond traditional criterion of truth. Here, we will show characteristic of the self-organicity theory in general.

1) dynamic equilibrium system: homeostasis, complex system

In the first place, we would like to show the characteristic of dynamic equilibrium system, whose idea is especially asserted to deny reductionism by L. v. Bertalanffy.

The word "dynamic" means interaction between system and environment. The above-mentioned explanation of self-formation is a rough system theory between a part and a whole, but compared with this, the dynamic equilibrium system is founded upon the relationship between system and environment. Through interaction with environment a system actualizes its maintenance by homeostasis mechanism with input/output exchange. Hence, the system has its own inner physiological environment to maintain the vital equilibrium system.

The faculty of balance in a system such as homeostasis, is characterized as an organization which shows self-organizing relationship between organized components and parts in a system, and characterized as diverse stages in the organized network.

Thus, the dynamic equilibrium system maintains its open system in which each component acts together with mutual influence to compose a system, and many levels of systems gather together to automatically constitute a stratified system of an individual through dynamic interaction with the environment.

However, this idea still remains being without an explanation of inner cause, because the equilibrium of a system is just considered in that the outer cause effects the system, and it shows the way to keep balance only in the light of relationship with the outer environment.

2) self-organizing system: fluctuation, entropy, phase transference

In the second place, we would like to consider self-organizing theory. The idea of this theory is different from dynamic equilibrium system. The latter is stressed in terms of equilibrium mechanism and stratified complex system, but the former is stressed in terms of the mechanism of self-organizing system which has been made famous in the theories of I. Prigogine and M. Eigen.

If something is formed, there must be some force to create shape in the spiral process of forming, maintaining and disappearing. The force must be entropy, but visible phenomena involve

fluctuation and entrainment. Therefore, a repetition to a certain direction with fluctuation and entrainment facilitates creations of self-organizing structures. Of course, this structure is not eternally stable, but is constructed in the process from chaos into being and from being into disappearing in irreversible time with the system's mutual reaction to the environment through input/output exchange.

The beginning of formation of self-organizing systems is brought about by chance with some initial condition. When primitive process might happen through fluctuation and entrainment, a certain structure might continue forming but the other would not necessarily continue forming itself. And at the turning point once the forming process is established, the system attains complete change with phase transference all at once. After that, self-organizing process progresses automatically and repeatedly to organize a new stage of the system.

The self-organizing system changes its boundary according to its growth through mutual interaction with the environment. The important thing is that the boundary is not definite but changeable. And also the system operates, as it were, from inner cause by means of exchange of material, energy and informational metabolism, so that it may be called an open system with input/output. From this we come to know that this system is an open system to the environment and grows automatically.

Inevitably, the definition of environment is very difficult, because such a living system continues to make its boundary with every operation, and at the end of each operation there appears the environment with its boundary. And the environment is regarded not as opposing the object but as mediation.

This phenomenon has something in common with the mechanism of the unconscious self. We humans are not usually aware of our selves in daily life, except when some event disturbs us. At this moment the consciousness of reflection makes a boundary of ego between ourselves and other things. This is very important when we discuss human recognition.

Consequently, in equilibrium systems mutual dependence relies on harmony in the relationship of the part and the whole or the system and the environment. Fluctuation, which may sometimes disturb the system, is avoided as a vicious factor in the dynamic system in general, whereas, in the self-organizing system it is necessary for automatic creation of the self-organizing system.

However, we have to advance to the autopoiesis system, because it suggests an important concept to us.

3) autopoiesis systems: self-reference, circularity, observer

In the third place, we will discuss the autopoiesis system.

Autopoiesis is an organic system which is formed by the process of each component's operation in a circular network. And the fundamental mechanism is almost the same as equilibrium

system. For instance, autopoiesis theory values fluctuation to maintain its system through compensating activity for the damage caused by fluctuation. But its activity is characterized by a self-referring quality in the process of the circular network and makes its own self-decision to maintain the autonomy of the system.

Among self-forming systems, the autopoiesis system provides very important thinking and terms. Above all, the term of self-reference and an observer are especially significant.

First of all, we are going to examine the term of self-reference. When we dealt with the self-forming structure of nature and man in the environment, we looked at the ecosystem in which self-recurrent mechanism works. In logical terms, we take this as self-reference.

E. Valera stresses the importance of ontogenesis compared with phylogenesis. This is because an individual has its own inner image (self-image) formed on the process of phylogenesis, which shows the history of organic transformation through self-recurrent dynamics on systematic unity as a species. In other words, ontogenesis includes phylogenesis in the way of nested boxes and already has an inner image of transformation. Therefore, the process of ontogenesis is such that an individual reacts with each organic transformation at each stage of phylogenesis. This transformation makes it possible to modify the activities of the system through self-referent logic. See picture (iv) again.

In this way, we can understand that behind the operation of self-recurrence there is a self-referent logic. This logic goes beyond the logic of dualism and reductionism.

Anyway, in this autopoiesis system, activities are repeated in the self-referring circle, they maintain themselves and raise potentialities in order to continually regenerate.

However, we are still left with the problem of the observer. This is most important concerning human recognition. We have to know the importance of the limited human recognition of an observer in a system from the knowledge of autopoiesis theory. That is to say, when every component of the system functions well, each component can not be aware of itself as a part or a whole. Likewise, if we are the components of the system and try to recognize or observe ourselves, we have to take a diversity of viewpoints outside the system and come to know that we stand only from the static viewpoint of the observer. As far as we are embedded in the system as a component, we can not analyze or reflect anything but we can intuit it. And no sooner have we tried to reflect about something in the system and to analyze it as an observer from the logical and static viewpoint, than we have to stop working in the system, being apart from the system.

Therefore, after the observation and reflection we have to throw the results into the system in seeking for "feedforward" to foresee the future.

Therefore, the ability of recognition by an observer is limited but if he realizes the limitation, he would be reasonably available for human recognition.

Therefore, we can understand the outline of the theory of self-formation or self-organicity from

the above characteristics.

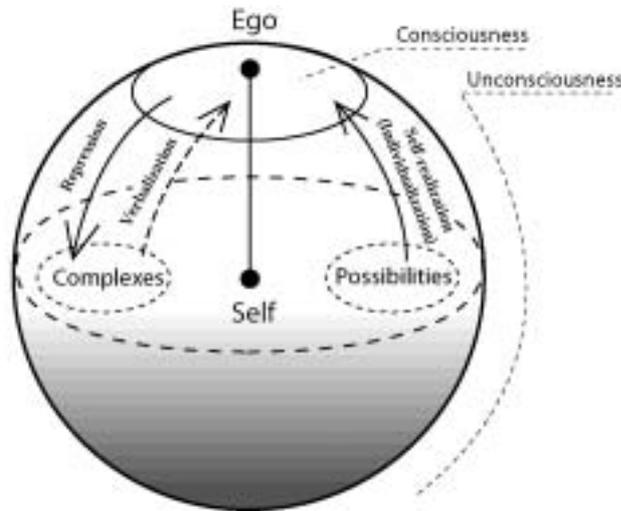
As a result of this general survey, it is very difficult to explain the self-referent or nest-web mechanism of self-organicity with the tools of old terms like formal logic; additionally, there is this problem: the new method of analysis has not been sufficiently established yet. So we have to complete it urgently in order to recognize the nest-web connection of ecological systems, and in order to find the solution of environmental issues.

IV Human recognition of the environment

(1) The structure of the human mind

Before we go on to discuss the human recognition of the environment, we need to know the structure of the mind, for it is the foundation of recognition.

According to S. Freud, we have not only the sphere of consciousness but also that of the unconsciousness. Therefore, when we think of human recognition, the total human should be considered. In other words, when we come to deal with recognition, we have to examine two spheres; namely, one is conscious recognition and the other unconscious recognition.



picture (v): structure of mind

Here we would like to adopt the fundamental model of C. G. Jung and we would like to arrange it. In accordance with Jung, there are two kinds of “I”s. One is ego, which is located in the center of the conscious sphere and controls consciousness. Here we call it Ego-I. Another “I” is “Self”, which is located in the unconscious sphere and integrates the comprehensive “I”. We may call it “Self-I”.

Jung himself confuses these terms. He sometimes uses them as a dualism, such as ego versus

Self, and sometimes correctly uses them such that Self includes ego as if Self were like a predicate of ego and comprehends ego from the viewpoint of monism.

It seems reasonable that we take up the concepts of ego and “Self” as Ego-I and Self-I, and take up the comprehensive “I” as “Total-I” in order to avoid falling into dualism (see picture (v): Ego-I and Self-I. Total-I consists of two-Is).

Certainly, on this supposition we will get two kinds of recognition. One is the Ego-I's recognition and the other the Self-I's.

(2) Human recognition from the viewpoint of Ego-I and Self-I

Human recognition is usually achieved at the Ego-I level which is mostly concerned with the external environment such as consciousness, reason, calmness, verbal communication and so on.

But however successful Ego-I education might be, Ego-I is restrained by its personal history, namely, its personal environment, and has some kind of bias. Hence the way and result of recognition is different in each person. Further, the ego is apt to raise the central point of the person and egoism from a human-centered viewpoint. What is more, not merely human but also every life has its own viewpoint and constructs its own environment from it according to the species.

We cannot live only on the level of consciousness, because we largely depend on daily customs and sleep at night to be set free from consciousness. Also we can not always judge and act deliberately by reason in cases of anger or sickness. Furthermore, the human ego is inclined to be distorted and has some bias even though brought up ideally, which make its recognition different in each person. These facts show us the limitations of the conscious recognition of Ego-I.

For that reason, we have to adopt another viewpoint instead of Ego-I. Accordingly, we must pay attention to two Is at the same time, that is, Ego-I which controls the conscious sphere, or external environment, and Self-I which integrates the whole person in the unconscious sphere, or internal environment. As for Ego-I, it is mainly concerned with the external environment regarding recognition, intention, action and so forth. And as for Self-I, it is mainly concerned with the internal environment regarding emotion, feeling communion, life and ecological system, and so on.

When Ego-I could not have a dialog with Self-I, for instance in dream, the conscious world and the unconscious world would be broken from each other and due to a disturbed inner ecological system a person would be neurotic. The neurotic client, divided Total-I, is essentially suffering separation from the outer environment.

Consequently, the mental wound will be cured by the faculty of natural healing which connects the inner injured ecosystem with the outer ecosystem in a circulation between the conscious and unconscious worlds. This is because at the bottom of the unconscious world there works a self-referent mechanism between Ego-I and Self-I through the inner ecological system as

well as the mechanism of natural healing.

Pathologically speaking, a client should realize his complexes in the unconscious world and verbalize them in the conscious world. On the other hand there is another thing in the unconscious, that is, the possibility which enables a person to achieve self-realization in his life and which is necessary for the environmental cure by means of the connection of the outer ecological system with the inner one.

Thus, Ego-I and Self-I should have the opportunity of a smooth dialog in dreams or meditation in the unconscious world, as Freud tells us that dreams fulfill desires which were not fulfilled in the real world. In that way, Ego-I will continue to be reborn into the new Ego-I. When Ego-I and Self-I get along well with each other, we may call them a sound Total-I, which may be regarded as equivalent to the viewpoint of analysis as a reflective observer of the system.

On examining human history, egoism is a typical way of thinking in the modern world and so far such egoism has greatly destroyed environments in every sphere such as the natural, social, and mental environments. Human beings are inclined to recognize everything from Ego-I viewpoint and adopt ego-centered recognition, egoism.

Therefore, we have to get out of the narrow Ego-I viewpoint.

(3) Human recognition seeking for solutions to environmental issues

As a consequence, human recognition on the level of Ego-I should be extended to the Self-I level in order to widen human recognition of the environment to the extent that we realize the common root of the structure of nature and man in the ecological system and awaken our senses with emotion, life, and instinct, which are sleeping in the Self-I grounded on the inner ecological system.

When we tackle the issues of environmental destruction, we have to admit the reality of a changing world. We cannot recognize the real world only in the way of Ego-I recognition because it is based on static analysis, that is, on the traditional criteria of recognition, dualism and reductionism. Consequently, we should take the lively viewpoint of Self-I, so to speak, Ecological-I in order to enable us to grasp the whole environment of living things by means of intuition and sympathy.

Such recognition of the Ecological-I may have a relation to the mechanism of self-organicity. As the embedded component as a part in the operating process of the self-organizing system, does not realize itself at all, so Ego-I, as a part of Total-I in the well-operating process of Total-I, does not usually realize itself, although Ego-I controls the conscious world.

But if Ecological-I or Self-I has a standpoint of Total-I which includes the ego sphere, we can achieve a standpoint of reflection as an observer and can confirm where we are, what we are doing and what we should do to maintain our global system. Nevertheless, we must not forget the position

of the observer, because it is a supposed position outside the system and it must soon realize that it is only one of the components of the system. Though the ability of the observer is limited, he is able to have a foresight of which way to go within the reach of human recognition of the environment.

V Practical cases of environmental destruction in Japan

Apart from self-formation explanation or self-organicity theory, we would like to present reports of practical cases of environmental destruction in Japan. We will apply the described theory to practical cases.

(1) Minamata Disease

We have studied issues of Minamata disease for about 20 years. And we have found that the problem has not ended yet, because it seems to appear in another way as chronic poisoning.

Minamata disease broke out first in cats which ate polluted fish and shells about 50 years ago. Illnesses were caused by liquid waste containing organic mercury. The patient's body trembles due to nerve-destruction, feeling perception is destroyed, the field of vision becomes very narrow, and the patient finds it very hard to speak and so on.

Minamata patients at fetus period in the mother's womb were also born as stated above. They could not speak fluently but understood everything I said by feeling communion when I met them in Minamata City. This means that even seriously handicapped people have their own will and personality despite language or other troubles.

This Minamata disease is caused by acute poisoning, but we modern people may suffer chronic poisoning from agricultural chemicals and preservatives in our food.

This fact provides us with a warning of the possibility of chronic poisoning. This is a problem in contemporary Japan. What's more, lately to our deep regret, there appears to be occurrences of Minamata disease in Canada, China and Brazil.

Giving this warning a theoretical application, we can take the example of Minamata disease, which should be understood beyond dualisms such as outer world and inner world, and understand it as the same world based on the ecosystem, not a fiction composed by reductionism. This is because if human beings destroy the outer world, for example Minamata Bay's contamination by waste fluid containing mercury, then the polluted outer world will be revenged by contaminating the inner world of the mothers' womb, poisoned amniotic fluid by the mechanism of self-formation in recurrent circles. The result was that babies were born with Minamata disease.

Thus, we must not forget that in the real world there works a self-recurrent or self-referent mechanism in the ecosystem. We should always keep in mind that we human beings are just

components of the whole ecosystem. It goes so far as to say that we human beings are the same as the environment. We should be much more modest to the environment and other lives.

(2) Deformed Japanese Monkeys

We have investigated deformed Japanese monkeys for more than 20 years. This issue has not been reported enough around the world. So I dared to report it at the Centenary of Peking University in 1998. At the International Symposium on Environmental Science and Sustainable Development in Peking University few participants knew about the miserable fact of deformed monkeys. This fact is by no means another persons' affairs, but human beings' affairs.

Deformed monkeys have been born every year ever since 1969 on Awaji Island in Hyogo Prefecture when people gave them the same food that Japanese people eat. The cause is guessed to be agricultural chemicals. As for Japanese monkeys, deformity mainly appears in hands and feet in various shapes: split, twisted, joined, lacking, or short hands and fingers. The average number of deformed monkeys is 17% over 20 years at Awaji Monkey Center on Awaji Island.

Look at picture (vi). This Japanese monkey is a new born baby, a picture which I took 6 years ago at Awaji Monkey Center. He has neither hands nor feet. Deformity may be connected with the environmental hormone, for both deformity and hormone trouble are commonly caused by chemicals. It is supposed that in the former case chemicals act on growth hormones and in the latter case act on procreative hormones. The case of lack of fingers or hands might be caused by growth hormone shortage; and that of too many, for example nine, fingers on one foot by growth hormone excess. Deformed monkeys warn us of the future for humans.

In this case we can realize that the environmental subject (human being or any living being) is the same as the environmental object (environment itself). We can not divide them into subject and object, or cause and effect dualisms and should always take the dynamic mutual interaction between human beings and the environment into consideration. Therefore, we should live together harmoniously with all lives.



picture (vi): deformed baby monkey

(3) So-called Environmental Hormone

Environmental hormone (endocrine disrupting chemical) has now become a hot topic in Japan. Quantity and quality of sperm in the young male-generation has declined and is less inactive (see picture (vii): decrease of quantity and increase of abnormal sperm) .

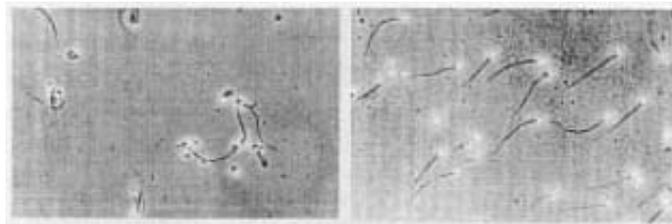
In many Japanese rivers female snail shells' gender changes into male, because they are affected by environmental hormone. They have small penises. In fact, they can not increase. Endocrine disrupting chemicals are estrogen, PCB, DDT and so on.

This phenomenon shows us that the mechanism of self-organicity doesn't work correctly and yet may in fact enable the sacrifice of its partial system, preventing a collapse of the whole equilibrating system.

This case tells us that we should sometimes take a standpoint of an observer to look through and reflect on which way we ought to go in the near future.

For the purpose of resolution of environmental destruction, we should think and act in the unity of "Only One Earth" (in space) and thousands of years (in time). This unity suggests to us the importance of intergenerational ethics.

We have witnessed these recent problems in the Japanese environment. These cases of environmental destruction are brought about by neglecting the circulating mechanism of the self-forming principle or self-referent theory in ecosystems, and ignoring reflection on environmental ethics.



abnormal sperm

normal sperm

picture (vii): decrease of quantity and increase of abnormal sperm

VI Conclusion: Inquiring into the foundation of environmental ethics and environmental education

We come to the conclusion that in dealing with environmental issues we need self-organicity theory to analyze precisely the self-forming structure of nature and man, and we should change our

viewpoint from Ego-I to Self-I so as to make efforts to solve environmental issues.

Whenever we observe self-organizing environments from the viewpoint of Ego-I, we arrive at an ego-centered perspective, or human-centered recognition. Concerning environmental ethics, accordingly, we have to change the viewpoint of Ego-I to that of Self-I. We need to construct a new environmental ethics founded on the viewpoint of Total-I, which is founded on Self-I, or Ecological-I, in order to gain an eco-centered perspective, or life-centered recognition rather than the limited human recognition of the ego-centered perspective, or human-centered recognition.

At the same time, environmental ethics should be constructed on the basis of a framework in two wide dimensions to establish intergenerational ethics, social rights and a liveable environment. In the dimension of space, environmental ethics ought to be considered in terms of one-earth unity, because man lives on “Only One Earth”, neither being released in the wider universe nor being narrowly enclosed in the egoistic personal life. In the dimension of time, environmental ethics also ought to be considered in units of thousands of years, because this is the same length of human history which is within the reach of his concrete understanding.

In this wide framework we can think of intergenerational ethics, liveable environment, rights of all lives and fair distribution of goods as essential to environmental ethics, which interprets the relationship of rights and duties towards future generations in time, or the fair distribution of earth resources for different countries in space.

In conclusion, when we consider environmental studies and sustainable development, the connection between human recognition of the environment and environmental ethics should be actualized in environmental education concretely from childhood and throughout life.

References

- 1) Eigen, M. and Winkler, R., *Das Spiel*, R.Piper GmbH & Co. Munchen, 1996. (picture (i))
- 2) Haken,H., *Erfolgsgeheimnisse der Natur*, Deutsche Verlags-Anstalt GmbH, Stuttgart, 1981. (picture (ii))
- 3) Stevens, P. S., *Patterns in Nature*, Little, Brown & Company, 1974. (picture (iii))
- 4) Nilsson, L., Furuholm, M., *Ett bar blir till*, Albert Bonniers Förlag, Stockholm, 1976. (picture (iv))
- 5) Bateson, G., *Steps to an Ecology of Mind*, Jonson Aronson Inc. London, 1987.
- 6) Bertalanffy, L. v., *General System Theory: Foundation, Development, Applications*, Braziller, 1968.
- 7) Nicolis, G. & Prigogine, I., *Self-organization in Nonequilibrium System : From Dissipative*

Structures to Order through Fluctuation, John Wiley & Sons, 1977.

8) Maturana, H. R. and Varela, F. J., *Auotopoiesis and Recognition*, D. Reidel Publishing Company, Holland, 1980.

9) Varela, F. J., *Principles of Biological Autonomy*, North Holland, 1979.

10) Capra, F., *The Turning Point*, John Brockman Inc., 1994.

11) Koestler, A. and Smythies, J. R.eds., *Beyond Reductionism*, The Hutchinson Publishing Group Ltd, 1969.

12) Stevens, P. S., *Patterns in Nature*, Little, Brown and Company, Boston, 1974.

13) Freud, S., *Vorlesungen zur Einführung in die Psychoanalyse; Gesammelte Werke Bd. XI*, Imago Publishing Co.,Ltd., 1940.

14) Jung C. G., *Analytical Psychology: Its Theory and Practice*, Routledge & Kegan Paul, Ltd., 1968.

15) Drengson, A. and Taylor, D., *Ecoforestry*, New Society Publishers, Canada, 1997.

16) Cadbury, D., *The Feminization of Nature*, Penguin Books,1997.

17) Colborn, T., Dumanoski, D., Myers, J. P., *Our Stolen Future*, The Spieler Agency, New york, 1996.

18) Shrader-Frechette, K. S., *Environmental Ethics*, The Boxwood Press, 1991.

19) *Asahi News Paper*, January 9th, 1998. (picture (vii))



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