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Send papers to the editor in electronic form if possible. Please use numbered reference style, do not use automatic footnotes or endnotes. Papers are peer reviewed.

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Editorial Note: What is Medical? Papers from Kumamoto Bioethics Roundtable (Part 2/2)

This extended issue of *EJAIB* has the second set of papers from the Third UNESCO-Kumamoto University Bioethics Roundtable -What is Medical?-, held on 12-13 December, 2009 in Kumamoto, Japan. Abstracts for these papers and others presented are on-line. The first group of papers was published in March 2010 issue.

The paper of Osamor in this issue was not presented in Kumamoto, but is related to the theme.

-Darryl Macer

Comparisons between Veterinary and Human Medicine

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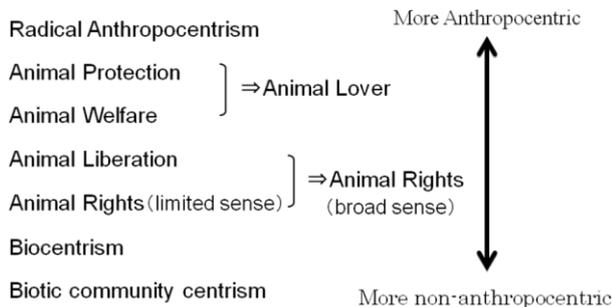
Moral Considerations for Animals

Firstly, I will consider the moral considerations over animals. Definitions of these ethical positions for animals are fundamental to ethical discussions about veterinary medicine. There are eight major positions I review: Radical Anthropocentrism, Animal Protection, Animal Welfare, Animal Lovers (doubutsu-aigo), Animal Rights, Animal Liberation, Biocentrism, and Biotic community centrism.

Radical Anthropocentrism

Basically, "anthropocentrism" is a position that believes humans are more important than anything else. There are some wide-ranging variations in this position. In what we can call the animal ethics area, Animal Protection, Animal Welfare, Animal Lover, and Biocentrism are

grouped with Anthropocentrism. Radical Anthropocentrism is the total anthropocentric position that denies considerations for all other nonhuman beings, and makes judgments for only human beings.



Animal Protection

Animal Protection is an idea that promotes the protection and love of animals as a social responsibility. This idea is derived from primitive passions of sympathizing with suffering or exploited animals. Advocates of this position have special feelings for animals in close connection to humans. There have been laws that protected animals, taking this position, for a long time, such as for cats in ancient Egypt, and dogs in Edo period Japan during the reign of Tsunayoshi Tokugawa.

Today, the idea of protection specific to animals can be lumped together under the term “Animal welfare.” The phrase “animal protection” is shifting more to protecting nature and also wild animals as well. For some this concept of nature protection takes on an anthropocentric stance because supporters of this concept protect the natural environment as public property, and select objects and methods of protection for human survival, and future human generation’s happiness.

Animal welfare

The World Society for Protection of Animals (WSPA) declares, “Animal welfare is defined by both the physical and psychological state of an animal and the conditions in which it lives.” Animal welfare is an improvement of the quality of life from an animal’s point of view. Animal Welfare derives from considering animals for protection based on a scientific understanding of their habits and actions, instead of merely loving animals emotionally.

Animal welfare aims to prevent the suffering or inhumane killing of animals as much as possible, and to allow the expression of natural behavioral patterns of each species in their rearing. The Five Freedoms listed in this table are international standards of animal welfare.

- (1) Freedom from hunger and thirst

- (2) Freedom from discomfort
- (3) Freedom from pain, injury and disease
- (4) Freedom from fear and distress
- (5) Freedom to express normal behavior

Supporters of Animal Welfare also feel that it is desirable to shift to alternative experiments in the future, if possible, through the 3Rs proposed by English physiologists Russell and Burch in 1959. The Three Rs are Replacement, Reduction and Refinement.

Animal Lover

I think that Animal Lover; 動物愛護 (doubutsu-aigo) may be an unique-styled moral position for animals represented by Chinese-Characters. It includes both Animal Protection and Welfare, without regard to their differences. Many Japanese laws for animals are made up in accordance with this position like the Animal Loving Law. Maybe, there is an idea of responsibility for Animals as a duty, from human’s superior status.

Animal Rights

This discussion originated in an attempt to extend the rights of humans to animals. In this argument, animals are considered as beings, not just mere objects, with independent inherent values and equal moral rights and status.

Supporters of animal rights assert that human beings are under direct obligations to be kind to animals and not to treat animals cruelly. Some of them limit the coverage to mammals only, as with Tom Regan. For proponents of animal rights, animals are beings that have non-reducible and unassailable values, not just being utilities for the interest of others.

Animal Liberation

Animal Liberation is an argument proposed from utilitarian views by Peter Singer. Singer argues that a sentient being has a right to equal consideration of interests and a person has a right to life. He sets the feelings of pain and pleasure as an index of moral consideration based on the fact that all vertebrate animals have similar nervous systems.

Biocentrism

Biocentrism implies a philosophical centrality of life. All forms of life are equally valuable. Biocentric thinking focuses on the well-being of all life in the consideration of ecological, political, and economic issues. One of the most radical ones was established by Paul W. Taylor. He said about Biocentric thinking as follow.

- (a) The belief that humans are members of the

Earth's Community of Life in the same sense and on the same terms in which other living things are members of that Community.

(b) The belief that the human species, along with all other species, are integral elements in a system of interdependence such that the survival of each living thing, as well as its chances of faring well or poorly, is determined not only by the physical conditions of its environment but also by its relations to other living things.

(c) The belief that all organisms are teleological centers of life in the sense that each is a unique individual pursuing its own good in its own way.

(d) The belief that humans are not inherently superior to other living things.

The moral consideration, from this outlook, is based on the specificity of moral thinking or judgments by humans. Therefore, it depends on the fundamental differences between humans and other species.

Biotic community centrism

This is a concept based on holistic-communitarianism proposed by J. B. Callicott. Callicott attempted to rebuild Aldo Leopold's Land ethic as a holistic environmental ethic. Land ethic focuses on land, which is a biotic community, and determines the ethical quality of each existence from considerations about their effects for the Land.

In this position, there is no discussion of special interests bring held in animals, but animal lives are valued for the sake of balancing the ecosystem. Endangered species are regarded as objects of protection. However, beings that are breeding too much and upsetting the balance of the ecosystem are regarded as targets of extermination.

Classification of animals...according to Feeding States

Next, let us consider how to organize target animals of veterinary practice. Animals can be classified according to feeding state in Japanese animal law. There are actually six classes: Pet Animals, Display Animals, Farm Animals, Experimental Animal, Wild Animals, and non-human-fed Animals.

Pet Animals are kept for companionship or pleasure at home or school. Like humane medicine, medical care for Pet Animals is provided for each individual. Care for pet animals aims to keep, recover and increase their own health. In that situation, the degree of care is mainly determined by the paternalistic attitudes of the owner. Choices of medicine are different according to the owner's economic condition and preference. These cares are based on the spirit of Animal Loving, especially Animal Protection.

Display Animals are kept for display, contact or sale, at zoo, shop, breeder or entertainment agency. This sort of veterinary medicine is not for Animals itself but for humans, behind this medicine is the exploitation of animals by humans. These cares are based on Animal Loving, in particular Animal Welfare.

Farm Animals are kept for industrial use in farms or factories. Laws on Farm animals are under the Ministry of Agriculture, Forestry and Fisheries. In this area, policies are selected not for animal's QOL, but for economically making delicious meat products for humans. Common veterinary medicine for Farm animals includes "diagnosis, treatment and prevention of disease", "direction for sterilization and improvement of animal's sheds", and "meat inspection". This kind of medicine does not aim to help individuals, but to manage health of all livestock as a entire economic production system. Infected animal usually do not take medical treatment to recover their own health, and the animal is usually killed to maintain the health of the group.

This medicine is supported by Animal Welfare. However, in reality, there are some farmers who treat farm animals as one of their family members. Those people may have a view point of Animal Protection.

Experimental Animals are kept for scientific experiments at universities or research institutes. Medical care for Experimental Animals is directed to achieve results of experiments for use to other existences, or just for knowledge. Caretakers do not aim to increase QOL of each experimental animal. "The Japanese Standards for breeding and safekeeping Experiment Animals" was set up to prevent injury and disease, and to cure them, within a scope which does not affect experiment. The ethical position of this type of medical treatment is limited to Animal Welfare.

Wild Animals are living in the natural environment. They do not depend on humans. Though they are affected by human activity. According to Japanese Veterinary Practice Act, Wild Animals are out of the target of veterinary medicine. Also there is a problem that no one can pay a medical bill for treatment of Wild animals. Japanese veterinarians find it impossible to make their living by just providing only care for Wild animal's. Public funds or NPO donors support them.

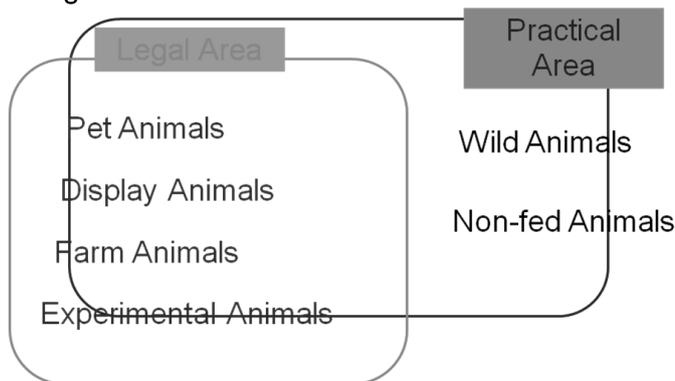
Some medical activities aim to protect rare species of wild animals, based on ideas of biotic community centrism. Biotic community centrists focus on rare wild animal species as protected groups. In some situations, the species that have

too much population are considered targets of extermination.

Some veterinarians provide medical care for Wild Animals to save their individual lives, on the basis of Animal Protection, Animal Rights or Animal Liberation, which positions treat each animal as individual. Thus, medicines for Wild Animals are derived from several different ethical positions.

Non-human-fed Animals are not kept by humans now, because of abandonment or escape. The Animal Law and Veterinary Practice Act of Japan also exempts these kind of animals from being targets of protection and veterinary treatment. Mainly, medical care for non-human-fed Animals are provided by a group of animal philanthropists, outside the framework of Laws. These sorts of activities are probably based on moral considerations that treat animals as individuals, like Animal lovers, Animal Rights or Animal Liberation. A public work undertaken in the name of dealing with non-fed Animals includes killing stray dogs and cats. That work has its roots in more radical Anthropocentrism. But, there are some effects of Animal Welfare, regarding killing methods, for example, not to treat cruelly and not to cause pain.

In fact, many Japanese veterinarians especially take an Animal Lover's position. It may be causally-related to Japanese Animal Law's standpoint, as Animal Lovers. Also in the eye of the law, Japanese veterinarian's business is limited to animals reared by humans. However, many veterinarians treat Wild animals and non-human-fed animals. And, many people act like in a position of Animal Lover, in the area of Display Animals, Farm Animals, or Experimental Animals, which belong to Animal Welfare's position notionally. We can see some gaps between legal working areas of veterinarians and practical working areas of them.



Comparisons between Veterinary and Human Medicine

The general characteristics of veterinary medicine can be also examined through comparing and identifying similarities and

differences between veterinary and human medicine.

Similarities

At first, I point out similarities between them. Medicine for Pet Animals aims to promote QOL of every single animal. This kind of veterinary care is similar to normal medical care for humans, especially children or incompetent person, in terms of dependence of the being on other agents such as owner or parents.

Public health and disaster medical care have similarity in the care for Wild Animals. Activity of public health aims to keep or promote the health of people in local groups or country. It gives preferences for advancing the health of everybody instead of each individual. At the time of disaster, the medical care team is allowed to triage patients. They emphasize efficient application of time, medical resources and human labor to save the largest number of lives, i.e., the utility of the whole population is more important than individual welfare. That point is similar to care for Wild Animals. However, public health and disaster medical care are not based on biotic community centrism, but utilitarianism.

Differences

I mention the differences between veterinary and human medicine. Fundamentally, medical law for humans sets up competent adults as targets for medicine. In the case of animals, all of them are treated as an incompetent existence by law. Well actually, there are probably few people that consider all animals have no ability to make decisions completely.

Many human medicines are provided for each human as individuals and depend on patient's self-determination. Public health and disaster medical care are based on a holistic view, but both intend to promote the health of the human species. However, veterinary care aims not to respect for animal's autonomy but to increase human's welfare in varying degrees, or to keep the health of the biotic community. Any stage of veterinary care is controlled by humans. They must involve paternalism by humans.

The targets of veterinary practice and ethical positions are separated by the rearing environment instead of by the treatment strategy, patients intention or the situation under which sickness occurs. This is also a point of difference with human medicines.

Conclusion

Medical care service is a kind of social pooled security. That purpose is not limited to recover the health of an individual person. Like veterinary medicine, human medicine includes not only

treatments to promote individual patient's QOL, but also care that is based on other persons or that aims to promote the whole population. In the case of human medicine, people highlight patient's autonomy or the right of self-determination. This review of veterinary medical care can promote us to be aware of this blind spot.

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- Ministry of the Environment <http://www.env.go.jp/>
- Net Vet Veterinary Resources <http://netvet.wustl.edu/>
- OIE (Office International des Epizooties) http://www.oie.int/eng/en_index.htm
- UFAW (Universities Federation for Animal Welfare) <http://www.ufaw.org.uk/>
- WSPA International (World Society for the Protection of Animals) <http://www.wspa-international.org/>
- WVA (World Veterinary Association) <http://www.worldvet.org/>

Informed consent in the Practice of Occupational Therapy

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The purpose of this study is to grasp the difference in way of thinking between a client within the family and the medical caretaker about disclosure in rehabilitation medical care. In this study, I performed focus group interviews with professionals and clients engaged in medical rehabilitation care. Based on these differences, I consider how to present an ideal method of the disclosure from the situation of the occupational therapist.

The focus group interview started from 1:30 p.m. on 23 January, 2009. We used the meeting room of the health care facility for the elderly. For health and nursing care practitioners, clients and the families, we asked for participation after we explained it with a paper, and consent. The theme at the group interview is "What kind of disclosure (explanation) should the medical caretaker do in order to offer high quality medical rehabilitation?".

Six medical caretakers participated in this study (Nurse: female, 15 years of experience, who works at department of rehabilitation medicine in hospital; Social Worker: female, 5 years of experience, hospital; Physical therapist: male, 5 years of experience, facility; Occupational therapist: female, 4 years of experience, hospital; Care manager: male, 3 years of experience three, facility). The author acted as the chairman.

Four people participated as client and the family (A: male, 50's, finger open fracture, outpatient, six months after occupational therapy started; B: Client C' wife, female, 60's, healthy; C is hospitalized with lung cancer; two weeks after physical and occupational therapy started at hospital; D: Female 60's, Cerebral infarction left hemiplegia, six months after physical and occupational therapy started at hospital, and two months after physical therapy transfer at facility; E: D's husband, Male 60's, healthy).

We performed the interview by a plan of one hour not to cause a delay in the duties of the medical caretakers. However, it was forty-five minutes in real holding time. In the analysis, we put down remarks on the contents during an interview. After the interview ended, we compiled it immediately into a database then performed summarizing

content analysis and an explicative content analysis (Flick 2002).

There were three domains provided from a focus group interview with regards to a medical caretaker's opinion of an ideal method of the disclosure.

The first domain was "Significance of the disclosure". Five items were extracted in this domain; 1) The disclosure is performed based on a contract. 2) We support the understanding of client. 3) We respect the right of client. 4) We perform mediation with a client and physician. 5) We confirm the understanding degree of the client for the medical examination of the physician.

The second domain was "contents". Four items were extracted in this domain; 1) For the therapy explained the enforcement situation (such as progress and the present conditions). 2) We don't explain prognosis definitely, because the motivation of the client deteriorates be of the prognosis of the medical rehabilitation. 3) We explained it (while regarding cooperation) with the medical caretaker and nursing caretaker. 4) We made much of opinion and the demand of the client.

The third domain was "methods of disclosure". Eight items were extracted in this domain; 1) We use a format that is determined by law. 2) (We perform it mainly on explanation in the word of mouth), because the letter of the format is small. 3) We give an explanation so we don't lose the will of client. 4) We set a place of the explanation. 5) We explain it to the family of client. 6) We perform the explanation repeatedly. 7) (We entrust the explanation of the occupational therapy to a physician partially). 8) We inform with other professions. [methods: explicative content analysis].

Regarding the disclosure for the client and the family, I extracted six items from four domains.

The first domain was "frequency of the disclosure". One item was extracted in this domain; 1) We want to ask a question without hesitation. We want to reply at that time of the question.

The second domain was "attitude of the medical caretaker". Two items were extracted in this domain; 1) (We don't want the medical caretaker to take action just by following a legal system). 2) (The medical caretaker should make much of the demand of a client and the family).

The third domain was "trust for the medical caretaker." Two items were extracted in this domain; 1) The medical caretaker should work in a cooperative manner with a client. 2) The medical caretaker should work in a manner that (they can explain to a client at anytime).

The fourth domain is "contents". One item was extracted in this domain; 1) We want to know the

degree of improvement of the client's mental and physical dysfunction.

We think that perhaps occupational therapists have the thought not to explain the prognosis. Because, occupational therapists think that "explanation of prognosis is a role of physician". Occupational therapists catches "prognosis" as a concept the same as "outcome". And it often seems to be that the occupational therapist regards explanation of "prognosis" for the client as a very difficult explanation to make. Furthermore, Occupational therapy practice is based on "prescription". Therefore we could think that it should not be allowed for occupational therapists to explain "prognosis" without permission by physician. However, occupational therapists draft occupational therapy plans by themselves. In the process, a occupational therapist sets short terms or long terms goals. And along with the occupational therapy planning, they may give some aggression to clients directly. Clients and the family request that they "Want you to explain prognosis" regardless of the type of job for a medical caretaker. An occupational therapist sets "goals" after having predicted the effect of the occupational therapy. The "goal" is worth being equal with "prognosis" for a client. An occupational therapist takes accountability for answering the demands of the client and their family. We think that accountability is to explain short term or long terms goals that we drafted along with regular occupational therapy planning.

Occupational therapists make an effort to understand disability and the lifestyle for the client. And we are going to offer the occupational therapy that is most suitable for a client. However, a format (called "Rehabilitation jissi keikakusyo" in Japanese) and a period set in laws and ordinances are established by law in regards to Japanese rehabilitation medical care and disclosure. Based on this format with consent by a client and the family, we can receive a fee for health and nursing care services through the occupational therapy. Furthermore, there is a chronic understaffing of medical caretakers in Japan, so they can only perform minimal required function. In other words, the disclosure of the medical caretaker is performed minimally in order to evade a legal dispute with a client and the family.

On the other hand, for a client and a family, such laws and ordinances and the contract matter are not important. A client and the family want to trust the occupational therapist, and based on the effect of occupational therapy, their satisfactions are met. The client who is going to plan to do rehabilitation through occupational therapy, has to have a long term relationship with a medical caretaker. The occupational therapy is supported

by the mutual trust and confidence between the medical caretakers, the client and family. Each other can understand through occupational therapy by replying client's demand repeatedly. As a result, we think that we can offer appropriate occupational therapy to satisfy the needs of the client.

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What is medical according to Japanese tradition

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Introduction

The purpose of this study is to consider the concept of medicine according to Japanese tradition. The Chinese character of “医” has two main meanings, one regards medicine, another is about alcohol. The former meaning is divided into three meanings: (1) to cure a disease, (2) doctor, (3) spiritual medium. I think that meanings 1 and 2 are based on scientific thought, while the 3rd meaning is based on mystic thought. I use “scientific thought” to mean considerations based on empirical and systematic knowledge or approaches, and use “mystic thought” to mean actions of understanding or creating meanings. I think scientific thought aims at the body, while mystic thought aims at the spirit. That is found in the concept of medicine in the Heian period. I focus on analysis of a medical book and story book.

1. The concept of medicine according to *Ishinho*

The medical books called *Ishinho* comprise 30 volumes. They are the oldest medical books in existence in Japan. They were edited by Yasuyori Tanba in A.D. 984. They consist of quotations from various medical books on Chinese medicine. In volume 1 of *Ishinho*, there is a general theory on medicine. In addition, in the first chapter of volume 1, there is an outline of treatments. The first chapter consists of quotations from six Chinese medical books. This study focuses on quotations of two Chinese medical books. The books are *Senkin'yoho* (『千金要方』) and *Taisokyo* (『太素経』). In the quotations from *Senkin'yoho*, there are an outline of treatment,

physician's attitude, and an attention in treatments. In the quotations from *Taisokyo*, there are two points. One is a relation between environment in which someone lives and sickness. Another is causes of sickness and treatments. I think there is a concept of medicine based on scientific thought in *Ishinho*.

2. The concept of medicine according to the idea of “mononoke” in *The Tale of Genji*

The story book *The Tale of Genji*, is one of the best known old writings in classical literature in Japan (and the world). The “mononoke”s appear in the book.

The idea of “mononoke” came from Chinese. However, the idea had changed in Japan. There is a characteristic of the idea of “mononoke” in Heian period. It is that “mononoke”s were deeply related to people. They thought that “mononoke”s could be causes of disease. It is believed that vengeful ghosts came to be “mononoke”s, and they sickened people who were to blame. Regarding this point, I think there is a concept of medicine based on mystic thought.

3. Conclusion

Since ancient times in Japan, there have been two concepts of medicine, one based on scientific thought and another based on mystic thought. Prof. Shinmura points out that patients put their ‘bodies’ in doctor's hand, but put their ‘life’ in spirits’ or Buddha's hand in the early modern ages in Japan¹. In addition, he mentions that it is important for patients to understand or create meanings of their lives.²

I think that “spiritual medium” means that a doctor should be a supporter for patients. When patients face their diseases, they need to understand them and create meanings of their lives. I think healthcare professionals should support patients in their understanding and creating meanings.

In conclusion we can say that medicine aims at body and spirit synthetically.

¹ Shinmura, T. (1989), *Shi to yamai to kango no syakaishi [The social history of death, disease, and nursing]*, Tokyo: Hosei University Press, p.21.

² I think that there are similarities between the act of understanding or creating meanings one's life and the narrative approach in bioethics.

Do Mental Disorders Really Exist?

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Mental disorders are defined using operational criteria. The Diagnostic and Statistical Manual of Mental Disorders (DSM) issued by the American Psychiatric Association provides a concrete example of this process. It enables clinicians to communicate both with each other and with clients and serves as a very useful means of defining the target of clinical research. As an example of the criteria operationalised by the DSM, the following slides show you the diagnostic criteria for depression. Depression is called "Major Depressive Episode" in the DSM-IV [1]. It is defined as being present if:

A) Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

- 1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful).
- 2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
- 3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day
- 4) insomnia or hypersomnia nearly every day
- 5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
- 6) fatigue or loss of energy nearly every day
- 7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
- 8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
- 9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

Modern diagnostic definitions of mental disorders are very precise so that clinicians can agree without difficulty on the presence or absence of each disorder in patients. Nevertheless, diagnostic agreement among clinicians does not necessarily prove that mental disorders exist.

Although operational criteria of mental disorders were initially proposed as tentative definitions that could be modified and changed if necessary, clinicians, students, patients, patients' family members, the media, and others have come to view these disorders as actual, definite entities.

Traditionally, mental disorders have been grouped into organic and functional categories. Organic mental disorders are those in which mental symptoms derive from dysfunction of the brain or the entire body. Alzheimer's disease and delirium are examples of organic mental disorders. On the other hand, functional mental disorders are those conditions in which mental symptoms exist without obvious organic aetiology. Schizophrenia, depression, and panic disorder are but a few examples of functional mental disorders. Organic mental disorders do not differ from bodily diseases. The focus of my presentation, however, is what are traditionally called functional mental disorders.

Some human conditions show a Gaussian distribution, also known as a normal distribution. For example, the distribution of a population's intelligence quotient scores is bell-shaped, with a peak in the middle. Conditions characterized by this type of distribution are thought to be influenced by polygenic heritability and environmental factors. Thus, they are physiological. There are no pathological causes. They are in the range of normal variation.

Other human conditions show exponential distributions, in which most individuals show no or only a few signs of the condition. A relatively small number of people are affected to a greater degree. Smoking, and specifically the number of cigarettes smoked per day, may be an example of such a condition. As with the Gaussian-type conditions described above, these are also viewed as physiological. Human conditions with exponential distribution are normal. Cases that depart from the median should be viewed as simply the result of normal deviation.

The appearance of a hump somewhere on the Gaussian or exponential distribution curves would suggest the existence of pathology. It is known that there exists a small hump on the lower, left-hand side of the intelligence quotient distribution. This represents a group of conditions involving mental retardation with organic causes. These probably include cases such as Down's syndrome, phenylketonuria, and others.

Therefore, it may be argued that if mental symptoms in a large population show Gaussian or exponential distributions, such symptoms should be regarded as normal. If, on the other hand, there exists a hump in the distribution curve, the existence of pathological causation may be suspected.

Meltzer and colleagues [2] conducted a large epidemiological study, the Office of Population Census and Survey, to examine this hypothesis in a general population. Carried out in 1993, this study examined some 9,500 community inhabitants and enquired about 14 common psychiatric symptoms such as depression, anxiety, and fear. The number of mental symptoms per person showed an exponential distribution, with no "hump" seen. This suggests that psychiatric symptoms are "functional". There are many other studies showing Gaussian or exponential distributions of mental symptoms.

What do these findings mean? You may feel depressed after separation from a loved one or after the loss of important things. You may as a result meet the diagnostic criteria of Major Depressive Episode of the DSM. Nevertheless, these feelings are normal. This may be compared with an analogy of increased body temperature (fever) after exercise. Fever after exercise could never be accurately viewed as a disorder.

The second topic of my speech is *dysfunction* as the definition of disorders [3]. Disorders may be defined as conditions that involve some type of dysfunction. An example is the pathology of cancer cells. Regardless of the distribution of cases in terms of severity, if the degree of dysfunction increases as a condition becomes more severe, the condition may be defined as a disorder. According to this definition, a more severe form of the condition would be associated with poorer health, while a less severe form would correspond to better health. If a human condition were a disorder, one would expect a positive correlation between severity of the condition and the degree of dysfunction. Thus, perfect health and normality may be defined as the absence of symptomatic conditions.

Are mental symptoms associated with dysfunction? Contrary to your expectations, all human conditions that are defined in terms of psychiatric symptoms have potentially adaptive functions. Therefore, such mental conditions are necessary for human life. Such faculties should be viewed as abilities rather than forms of pathology. I can show you some examples.

Depression may increase empathy towards others. After the loss of a loved one, grief may be a necessary step to recover from such a loss. You may see as abnormal a person who never grieves

over the sudden death of a loved one. After a very stressful situation, you may need a rest that may be brought by depression.

Fear (phobia) may reduce risk-taking behaviours. In the long history of humanity, people who did not feel fear towards snakes were more likely to be poisoned by them. People who feel less anxiety near a high cliff are more likely to fall off the cliff.

People who are overly concerned about disease are termed hypochondriacal. But people who are concerned about infection are more likely to take care of themselves. They may wash their hands when they return home. They may consult a physician when feeling physical discomfort. Hence, they can avoid being infected by viruses or are more likely to identify a serious disease early enough to take appropriate measures. People who are less or not concerned about ill health are more likely to suffer from diseases. Hence, hypochondriasis has the capacity to protect you from ill health.

Even paranoia may lead to a diminished risk of being victimized by theft, fraudulence, or perhaps murder. People less concerned about the possibility that their belongings may be taken away may leave their jacket with a wallet inside it in a vacant room.

While these traits may be maladaptive in excess, their absence is similarly detrimental. There is no dose-response relationship between the degree of the condition and the dysfunction caused by it. This is different from bodily conditions such as cancer cell pathology.

To further my argument, I would like to think about how to define dysfunction. Dysfunction is not an integrated part of the individual. Dysfunction appears in an individual in a specific context. For example, strong fear of snakes may be dysfunctional today but it may have been functional in the past. Therefore, it is not the person but the society in which the person is situated that defines dysfunction. Hence, dysfunction is a product of person-environment interaction. If disorders are defined as conditions that are dysfunctional, then there are people who are disordered in some situations but healthy in others. Such a way of defining mental disorders cannot meet the requirements of science. It is culture that defines which condition should be viewed as dysfunctional.

These considerations suggest the possibility that there is no such thing as a mental disorder. This is not to claim that professional mental health support or treatment is not needed. You may argue that medical professions treat people with disorders. This is, however, not the case. Medical professions treat patients. The definition of patient

differs from the definition of disorder. An easy example is the case of hyperlipidaemia. People with hyperlipidaemia do not complain of any discomfort. They are not dysfunctional. And yet medical professionals treat people with hyperlipidaemia. In psychiatry, mental health professionals treat those people who feel anxious while making a speech publicly. According to my presentation, this is normal. And yet, cognitive behavioural therapy is an established means of treatment in psychiatry.

What are the disadvantages of viewing mental conditions as disorders? Accepting the concept of mental disorders as established fact, without critical discussion, may lead you to accept or recommend drug treatment that has only weak evidence of efficacy. You may stigmatise people labelled as mentally ill. For example, people labelled as mentally ill may be regarded as incapable of self-determination. This may result in violation of human right and coerced treatment in psychiatry. People who committed a serious crime may be viewed as lacking criminal responsibility once they are viewed as mentally ill and thus lose a chance to participate in a fact-finding trial. This may result not only in human rights violations but also in an indefinite period of coerced treatment in hospitals or of community commitment.

Considering that there is no such thing as mental disorder (except for organic mental disorders) may shed new light on the ethics of psychiatry.

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Medicine and happiness

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Medicine and happiness have always been important concepts in bioethics. However, especially when we face some of recent bioethical issues such as enhancement or some growth attenuations like Ashley treatment, we often turn our attention back to those concepts and the

relationship between them. Enhancement is generally defined as 'Intervention on the human mind and body for "improvement" rather than "treatment"'.

The critical problems of enhancement are not only what kind of enhancement is ethical, but also what kind of interventions are improvement rather than treatment and medicine. As a possibility of medical intervention has been expanded, these kinds of bioethical issues on the boundary of medicine have increased. When we face with these difficult issues in bioethics, we often require considerations or confirmation of some fundamental concepts such as medicine and happiness of patients.

Firstly, I will confirm the concept of happiness. Certainly, many philosophers have tried to figure out the concept and there is an enormous amount of research on it. However, basically, there are two aspects in the concept of happiness, and most philosophers and researchers emphasize either an objective aspect or subjective aspect. Ancient Greek philosophers such as Plato and Aristotle are in the position of representing the later. Aristotle defined "good" in terms of goal or purpose which something or somebody moves. Therefore, there are a lot of goods because there are a lot of activities and goals. In regard to this point, he also mentioned "supreme good" among such a lot of goods. According to him, supreme good is one goal which we desire for its own sake, and we desire other things for its own sake, and we do not choose everything for the sake of something else" (*Nicomachean Ethics*, Book I, 1094a). He thought that only *eudaimonia* or happiness can be this supreme good. In the ancient Greece society, *eudaimonia* or happiness included both the notion of behaving well and the notion of faring well. Therefore this kind of state was described as fulfillment of human functions and abilities and it means virtuous life. He also mentioned common basic necessities of life and luck in addition to this, but fulfillment of human functions and virtues are the most important factors of happiness.

Modern philosophers and researchers often emphasize subjective aspects. This is also a concept as a goal but this is mainly related to pleasure. Some concepts of mind related to pleasure in their argument are sensations, moods and emotions. Many researchers in this position put emotions and moods above sensations. This pleasure as emotion is often related to fulfillment of preferences and desired acts. In addition to this, although some of them distinguish various pleasures as emotions, most philosophers and in particular utilitarians, distinguish some pleasure from the other in terms of quality and the amount of pleasure. In regard to this point, they emphasize

happiness is multidimensional. For example, completeness, intensity, frequency, variety and duration are some dimension of pleasure.

These subjective and objective positions are opposed to each other but both positions provide important insights into the concept of happiness. In fact, these two are complementary positions. An emphasis on multidimensional aspects is the same as an objective position. Although a subjective position criticizes objective theory for its objective elements, subjective position depends on some objective elements as long as it distinguishes some pleasure from the other in terms of quality and amount of pleasure. On the other hand, pleasure is also an important factor in the subjective position. For example, although Aristotle denied not only fortune and fame but also pleasure as a state of happiness, he acknowledged that only pleasure meets most of the requirements of supreme good and that pleasure is accompaniment of happiness.

As Aristotle thought, there are a lot of goods as goals, and the concept of happiness as a supreme good is the most inclusive goal in medicine. A goal of medicine includes various factors depending on researchers or situations. However, it has generally a commonality. For example, it includes treatment and prevention of disease, pain relief and diagnosis as a practical goal. At the same time, maintaining and restoring of health, improvement of QOL and best interests of patient are also included. These concepts can be broader concepts than some practical concepts.

As I already mentioned, the concept of happiness is the most complicated concept and it is multidimensional. Then, it includes many factors, for example, common basic necessities of life and luck. Therefore, the goal of medicine is not achieving a state of happiness but a contribution to part of it. To see how medicine contributes to happiness, I consider the concept of health. Although all of those broader concepts are based on and closely related to happiness, the concept of health plays the central role in this connection. This is not only because health traditionally has been regarded as a goal of medicine, but also because the other two broader concepts cannot deal with some ethical problems. The problem of enhancement is one of the examples.

As I mentioned at first, one of basic problem of enhancement is about the medicine/enhancement distinction. In regard to this point, the concept of QOL or best interest is not useful. This is mainly because these concepts are basically open-ended. Certainly, these concepts are also complicated and we have to examine these carefully. However, these QOL and best interests arguments are basically similar to the concept of

happiness in regard to this point. On the other hand, as we will see below, there can be ideally upper limits to the concept of health. Therefore, we consider this kind of problem of distinction, and we need the concept of health as a basic concept to the other two concepts. In this sense, the concept of health is more fundamental factor and it is important to analyze this concept for figuring out the relationship between medicine and happiness.

When the concept of health is argued about, subjective and objective factors are also emphasized. Subjective factors include, for example, some feelings such as ease and wellbeing, or lack of some feeling such as pain and suffering. Objective factors mainly means maintaining abilities. Both aspects have causal and conceptual connections. An example of causal connection is that a feeling of ease leads to fulfillment of abilities and feeling of pain disturbs it. On the other hand, maintaining and fulfillment of abilities leads to a feeling of ease and wellbeing. An example of conceptual connection is that having pain and suffering means lack of abilities in a broader sense. However, lack of ability doesn't always mean lack of feeling, for example some kind of coma. In regard to this point, maintaining and fulfillment of abilities can be basic factor to some extent. Here I will focus on the some theory of health in terms of ability.

There are two different viewpoints on health as maintaining and fulfillment of abilities. These are analytic and holistic viewpoints. One of these kinds of theory is elementalism and takes the analytic viewpoint. This is often called biostatistical theory (Boose, 1977). They use statistical methods to try to identify typical abilities. In this theory, states of health are defined as maintaining of statistically-averaged ability. Boose is in the position of representing this, and not only as a philosopher but also some scientists and medical practitioners take this position. This idea of statistical average of abilities is a practical and important idea. However, this theory generally is not sufficient in terms of justifying what kinds of abilities are related to health.

In regard to this point, there are two kinds of abilities in the philosophy of action. One is first-order abilities and the other is second-order abilities. First-order ability is an ability that someone acquires through some kind of social training. An ability of speaking a foreign language is an example of such ability. A second-order ability is a basic ability for acquiring first-order ability. Ability of hearing and some kind of intelligence are examples of such an ability. This concept is almost the same as an innate capability. Although these two abilities are difficult to distinguish and partly depend on situations, this

second-order ability is related to the ability which the concept of health includes.

Certainly, biostatistical theory regards these kinds of abilities as abilities related to health. However, this theory is based on biological function and its goal and the range of such abilities is relatively narrow. On the other hand, the other type of the theory takes a holistic viewpoint and the theory tries to figure out vital goals of human activities. This kind of position regards these vital goals as human needs, goals set by the agent himself, and welfare. Although biostatistical theory is quite important in terms of practice, it needs this holistic viewpoint as a theoretical foundation and determination of practical range of abilities relating to health.

There are many arguments about these vital goals such as human needs, goals set by the agent himself, and welfare in holistic positions. However what is important here is that what these positions factually regard as vital goals are almost the same and that all of these factors are some second-order abilities for minimal happiness. As I already argued above, the concept of happiness has some dimensions, and the concept of minimal happiness is possible. In addition to this, fulfillment of some actions and abilities for those actions is the most fundamental part of the concept. Therefore, the concept of health is theoretically regarded as a state of maintaining and fulfillment of some second-order abilities of acts for achieving minimal happiness. At the same time, this shows the basic and conceptual relationship between medicine and happiness. In regard this point, ideally there are upper limits to the concept of health and we have to try distinguishing medicine from some doubtful medical interventions such as enhancement and growth attenuations.

Here, I confirmed some dominant positions on the concept of health and medicine. Then I also confirmed health as a key concept in the basic and conceptual relationship between medicine and happiness. Certainly we are required to give in-depth consideration to many factors such as second-order ability and minimal happiness, and these can be some of the most challenging problems. Philosophers or researchers may not have given a sufficient answer. However, when we face with some bioethical issues on the boundary of medicine, we have to turn our attention back to this conceptual relationship between medicine and happiness and this can offer basic framework for dealing with those problems.

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The concept of medicine: Reflections from the transition of Japanese laws concerning medicine

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1. Introduction

I would like put down some assumptions as follows:

The law might support, and restrict the system.

The concept of medicine or medical treatment might be restricted by the law.

I think that it is likely to be able to approach near the central concept of medicine and medical treatment by examining the restrictions. As it were the constitution in the medical treatment the law of Medical Care Law, we might be able to approach the concept of the medical treatment by examining the transition of Medical Care Law.

Next, we are going to analyze the concept of "Medicine or medical treatment" from the "Transition of Medical Care Law".

2. Object and Jurisdiction of the Ministry of Health, Labor and Welfare

A law authorized the establishment of The Ministry of Health, Labor and Welfare. This law requires the jurisdiction of the Ministry of Health, Labor and Welfare.

As the object of this law, Article 3 is: *"To aim at security and the improvement at the national life, and to contribute to economic development, the maintenance of the environment that leads to the improvement of social welfare, social security, and public health,"*

And, as affairs under the jurisdiction:

Concern the spread and the improvement of the medical treatment.

Concern guidance and the supervisor of the medical treatment.

Concern the maintenance of the medical institution.

Concern doctors and dentists.

But article 3 does not define in a substantial manner "Medicine and medical treatment".

3. Enactment process of Medical Care Law (or Medical Law)

In the Diet, when a new law is enacted, and it changes, the presenter (It is Cabinet and a government usually) explains the outline.

The government delegate in the 2nd Diet in 1948 presented and explained the idea of Medical Care Law, as the following:

What Medical Care Law targets:

The first: Hospital standard

The second: Clinic

The third: Facilities concerning associate production

The fourth: General hospital

The fifth: License system degree of establishment

The sixth: Public hospital established by the local government.

The seventh: Advertisement

4. Transition of Article 1 of Medical Care Law

Transition of obligation of "Purpose" of Medical Care Law of Article 1 and the idea of supporters. In the past Article 1 provided "this law aim at securing the system to offer the medical treatment and to contribute to the maintenance of the public health".

At present Article 1 provides, "*this law aims at securing the system to offer the protection of the profit of the person who receives the medical treatment, good quality, and the proper health care efficiently, and to contribute to the maintenance of the Public health that has it*".

"Protection of the profit of the person who receives the medical treatment" and "Good quality and the proper health care are efficiently offered" are of intermediate value and the method is added though the final purpose "Maintenance of public health" doesn't change.

Paying attention to the patient's esteem and dignity, the doctor, the dentist, the pharmacist and other medical providers should treat persons in the background of mutual trust.

The treatment might include the following, not only treatment, but also disease prevention and rehabilitation under the good quality and being appropriate.

In addition, on the intention of the person who receives the medical treatment providers should respect the patient's preferences. Treatment will be offered in proportion to the medical facilities. Treatment will be offered relating to other facilities including the welfare.

Moreover, article 1-4 put responsibility on the doctor, the dentist, the pharmacist, the nurse and other providers to be of good quality and appropriation. They have the duty to obtain understanding from persons who are being treated.

5. Philosophy of law approach

Character and classification as social norm of law

6. Law sociology approach

More than 70 revisions to the Medical Care Law have been passed. I would like to analysis the 13 revisions aiming at the whole change of the law and 2 revisions. These include items such as Hospital standards, Clinic, Facilities concerning associate production, General hospital, License system degree of establishment, Public hospital established by the local government and Advertisement.

Medical is medical if and only if it is practiced on Axioms of Bioethics

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Introduction

Our 5-star hospitals have patients who have money but no disease and yet on the roadside and the rural side many patients have diseases but no money. This is partly true for the state run hospitals also. The obsession health for all by 2015 AD inevitably pushes our society towards creating more medical schools; more doctors, more ICUs, more gadgets (most of them imported), manufacturing more drugs and phobias, all these at the expense of a simple formula-edible bread and potable water for all by 2015 AD. Now we are in 2009 and let us list our successes in bringing good health to all, at least in India.

One of the major reasons for the failure of the WHO dream (initially set for the year 2000 A.D.) is the failure of the modern medical community to accept the success of native medical practitioners in bringing cures for incurable diseases, to go further steps in the field of orthopedics, for example. Modern medical science as any other physical or biological science has morally divided the Indian society by depriving the dignity of labour of the traditional medical practitioners. This, in a way has been called by some as a violation of

fundamental human rights and non-adherence to some of the principles of bioethics and particularly to the definition "Bioethics is love of life" (Macer, 1990). In this work we present the salient features of a case study conducted in Atchampathu village, which is situated 5kms north of Madurai, Tamil Nadu, India, where the practitioners adhere to the principles of bioethics in the field of herbal medicine to cure hepatitis. We also present a report on the traditional practices for bone fractures practiced in Poosaripatti, a village situated to the north of Madurai, Tamil Nadu, India.

Manjakamalai Atchampathu

The traditional practice of curing hepatitis by herbal medicine in this village has started 150 years ago. In the late 1950's the village was also called 'Hepatitis Atchampathu' and came into limelight in the news of all India radio way back in the year 1976. Almost 80% of the habitants of this village belong to the same caste. Now only 6 families are practicing this method as it is quite interesting to note that in 1960's the fees collected by the practitioner per patient was Indian rupee one and paise twenty five (5 US cents) only. This money is spent for two causes. The practitioners charged 25 paise for the treatment and kept it for his/her own maintenance and the remaining one rupee is offered to Lord Murgan's temple, in Tiruparankundram (a sacred temple for the Hindus situated to the south of Madurai) where the poor are fed once a month. Is this not an example of "Sharing"? But slowly this practice has declined in modern days as we had from one of the traditional families who are living in this village for a long time. Now in 2009 the fees charged ranges from Indian Rupees Fifty to Three Hundred (US\$ 1 to 7).

The Curing Process

The patient who is affected with hepatitis can come to the house of the practitioner at his/her own time of convenience throughout the day and at the time even late nights. This reminds as of Nicodemus in the Bible who went to Jesus for a spiritual clarification, very late at night. Jesus was well available for receiving the patient (Nicodemus) and clarifying his spiritual sickness and curing him of his Jewish spiritual wants. The availability of the physician in Atchampathu village at all times is really one of the ethical values of a physician, which should be followed with great care.

The practitioner asks some questions related to the sickness of the patient (for example the colour of urine, any other related symptoms) knowing the severity of the hepatitis case then the practitioner applies a herbal powder mixed with water with

his/her own hands on the head of the patient. While this is being done a camphor stick is lit before the photo of the deity and holy ash is applied to the patient on his/her forehead. This is followed irrespective of the religious faith of the patient. This is a good sign of religious tolerance and a basic step towards promoting religious harmony in our country, where we are divided by caste and religion. Is it not one of the bioethical principles of starting inter religious dialogue, which is one of the most important needs in our country. The patient is given the herbal powder and is asked to apply it three times on the same day at regular intervals. Now the practitioner's duty is almost over. Before leaving the home of the practitioner the practitioner gives some instructions to be taken as precautionary measures along with a pamphlet, which contains the instructions to be followed by the patients for a minimum period of one month to a maximum period of twelve months. One important precaution for young couples is to avoid sexual intercourse for a period of six months; this seems to protect the health of the partners. In a way the dignity of women is upheld by safeguarding her health from the contagious hepatitis. But the practitioner cannot differentiate Hepatitis A from Hepatitis B for both the causes the treatment is the same. The treatment is a one day treatment. We were astonished to hear from almost 675 villagers (who had undergone the treatment once) in and around a radius of 15kms at different age groups (9 years to 82 years) that the success rate of cure from hepatitis by this method of herbal treatment was 100%.

The Herb

Though the practitioners do not reveal the name of the herb to the patients, it is a well-known herbal plant that sprouts in the rainy season near water ponds. Now they are plucking and collecting the plants in the rainy seasons and dry them and make it in the powder form so that the herbal medicine can be used throughout the years. We came to know that some of the relatives of these families practice this type of traditional medicine in their own places of settlement in other states of India.

The Bioethical Lessons

The cures for the patient are coming from the action of the herbs on the biological system or due to the divine power possessed by the practitioner or due to both remains a mystery and it is a scientific challenge that has to be researched in the laboratories. The medicine is obtained at affordable cost, the treatment time is less and moreover the practitioner-patient relationship is rightly bonded and this bonding of faith in the

practitioner is high in this type of treatment. Even in Tamil Nadu there are so many like Atchampathu where traditional medicines are practical not for business but for the 'beneficence' of the patients.

Orthopedics Cure Poosaripatti

There is a village named Poosaropatti which is about 80 km west of Madurai city in India. This has been practiced since 1750 AD. The traditional practice for all types of bone fractures adhering to the principles of bioethics is one of the numerous examples of Indian Traditional Medicine. The patient who suffered a bone injury is brought to the traditional practitioner. Both the patient and the practitioner sit on the floor. The practitioner sees the nature of the fracture and does some physiotherapy to put the bones in the right position (without the aid of the x-ray). The patient is bound over with a bandage in the afflicted part of the body. After 24 hours from the time of putting the bandage locally made oil has to be applied for another 20 to 30 days. If the patient is an aged person special oil is applied. The cure for the bones is almost achieved within 42 days depending on the nature of the fracture. The maximum fees charged do not exceed US\$ 25 in any case.

The bioethical lesson that has to be learnt from these traditional practitioners is:

1. The treatment is economical (doing good to all irrespective of wealth)
2. The patients are not treated after sunset because, they say that if the patient is treated after sunset he/she cannot bear the pain as some pain killing injections have to be administered immediately for which there are no provisions in this village or in the nearby villages. They do not put injections to the patient. This is practice of high ethical standards.
3. The practitioners maintain an impartial relationship with the patients (Justice).

Conclusions

The sad news about this type of treatment done in Atchampathu is that almost all the practitioners are affected by some kind of bodily ailments especially skin diseases. These practitioners sacrifice their lives for the betterment and harmonious living of patients affected by hepatitis. It is our ardent desire to take up this work exhaustively and find the scientific reason behind the skin diseases of these practitioners, which is an ethical concern of us who live here in the Atchampathu village. We would like to conclude that as we envisage the field of diseases and medicines, if western practitioners can take the good from the traditional practitioners, human beings pertaining to the lower strata of the

developing countries will not be at loss with infections diseases and it is never late for us to turn back and move forward.

Acknowledgment

The tireless work of Mr. S. Kethirapalu of Atchampathu village is highly appreciated for his narration of the history of the village and taking us to different parts of the village. We appreciate Mr. Mani who is a traditional practitioner for bone fractures of the Poosaripatti village for narrating the history of the practice.

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What is Medical? Reflections from clinical viewpoint and experience

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To discuss on "what is medical?" is almost the same as to discuss "what is medicine?". Medicine is a product of human society and civilization, and always changing – usually developing but sometime degenerating and retrogressing.

Medicine relates very closely to natural factors such as climate, biosphere and human factors such as economy, politics, religion, philosophy, ethics and so on.

The aim of medicine is usually said to be: (a) to improve the health of people; (b) to achieve prevention of preventable diseases; (c) to detect and treat diseases in curable stages; (d) to turn incurable diseases into curable ones; (e) to minimize unnatural and unwanted injuries and deaths of people.

However, there are many other definitions of what is medicine. Someone says "medicine should cover whole fields of health and disease, not only of humans, but also of animals and plants, furthermore of water, air, earth and space. On the other hand, among health care specialists medicine means very often "internal (non-surgical) diagnostic and therapeutic methods" or "modern scientific pharmacies".

I am neither a bioethicist nor a philosopher but a clinician, more exactly a surgeon, radiologist, and

a pathologist. During WWII, I was a medical student in Sendai, Tohoku University School of medicine. After WWII, I trained mainly in Department of Obstetrics and Gynecology, Tohoku University School of Medicine, and thereafter, I worked as a teacher and a practitioner in Hirosaki University and her related hospitals around 40 years. This paper is based on my own experience.

“Medicine” and “Health Care”

Today, the term “health care” is more common, and is used more widely in Japan than “medicine” not only in the public language but also among physicians.

The Three Sectors of Health Care

In a wider sense, health care can be classified into three sectors. They are the popular sector, the folk sector and the professional sector. Since the 1870s in Japan, the professional sector of health care was done under the strong influence of Germany and U.S.

In the popular and folk sectors health care remains up-to date very widely. They are Shintoistic practices of rinsing the mouth, washing fingers and hands, sprinkling by the use of salt and/or salt water, purification of whole body in the baths, in running streams or river, or under a waterfall.

Probably the most important hygienic habit among Japanese people is to take off their shoes when they come back to their homes, and when they visit shrines, Buddhism temples, Japanese restaurants and so on. One of the reasons why we Japanese succeeded to realize the longest life expectancy is this habit.

3. Specialization of Postwar Medicine

When I was a medical student, in Tohoku University School of Medicine, only 22 professors taught us. They were specialized in anatomy, histology, physiology, biochemistry, pathology, bacteriology, hygiene, pharmacology, medical jurisprudence (law medicine), internal medicine, surgery, obstetrics and gynecology, pediatrics, ophthalmology, otorhinolaryngology, dermatology, venereal diseases, and psychiatry. On the other hand, departments of X-ray and radiology, and of orthopedics, and Institutes for Tuberculosis and Leprosy, and Institute for Space Medicine were founded in 1942. But after WWII, specialization progressed greatly, and today in Tohoku University Hospital more than 60 professors are working and teaching.

More exactly, after WWII, under the strong influence of American medicine, more than 30 specialties were newly founded. They are: Clinical Diagnostic Center, Surgical Operation Center,

Perinatal and Peripartum Center, Radiological Center, Rehabilitation Center, Intensive Care Unit, Departments (hereafter “D”) of Anesthesia, D. of Thorax Surgery, D. of Brain Surgery, D. of Cardio-Vascular Surgery, D. of Reproductive Medicine, D. of Nuclear Medicine, D. of Molecular Biology, D. of Cellular Biology, D. of Nuclear Biology, D. of Cellular Pharmacology, D. of Geriatrics, and D. of Perinatology.

4. Health Care policy and Medical Education in Japan

Since the Meiji Restoration (in 1868), the Japanese Government took a policy of De-Asiatification and Euro-Americanization (脱亜入欧). And health care was controlled by the Domestic Ministry (内務省) while education of doctors, midwives and nurses were organized under the direction of Ministry of Education (Culture and Science 文部省). Up-to 1937, we had no Ministry of Health and Welfare (厚生省).

To obtain a license of a doctor, we must study in and graduate from a medical university or college, and from premedical course in high school where Ministry of Education authorized.

The old Domestic Ministry consisted of eight departments. They were departments of national security police, local administration and economy, construction of roads, bridges, harbors and so on, issues relating to shrines and religious, geographical studies, finance, and public health and hygiene. For a long time, the main subjects dealt with by Department of Public Health and Hygiene of Domestic Ministry was prevention and control of infectious diseases such as cholera, pest, measles, diphtheria, typhus abdominals, leprosy, tuberculosis and so on, lowering of *Kakke* (脚気) patients and infant and maternal mortality, and the elevation of national nutrition level.

In 1937, however, under the strong influence of Nazis in Germany and at the request of the Army who hoped to have more healthy youngsters, the Ministry of Health (and Welfare) was founded. Needless to say, the Ministry of Health (and Welfare) was placed under the strong control of Japanese Army. From July of 1941 to July of 1944, the seat of Minister of Health (and Welfare) Ministry was occupied by Army General.

After WWII, the Ministry of Health (and Welfare) metamorphosed into today's style of a Central Government Office for the health and welfare of whole Japanese people from the time of being an embryo/fetus to senile/older high-agers, along a line of Post-war Constitution, especially of Article 25.

5. The bright and dark side of Modern High-Tech Medicine

Modern medical technology such as X-rays, magnetic resonance imaging (MRI), computed axial tomography (CAT) scans, and advanced fiberoptic techniques has radically not only altered our sense on the human body and clinical practice, but also changed the doctor-patient relationship and health-care economy.

Modern high-tech medical technology has had major social and economic costs for those who use it. It is increasingly expensive to buy, to operate, to maintain and repair. It needs specially trained technicians, maintenance workers, repairers and supervisors, as well as a constant supply of electricity and a reliable source of spare parts.

On the other hand, diagnostic technologies has also led to the creation of a new tier of 'patients'. These are the products of (diagnostic) technology such as strips of ECG paper, X-ray plates or printouts of blood tests. Sometimes they are the focus of more medical attention than the patients themselves. For some health professionals these 'paper patients' are as interesting - or even more interesting - than the patients themselves. Abnormalities can now be detected by these machines at the cellular, subcellular, biochemical or even molecular level, even when patients have no clinical (or abnormal) symptoms at all.

Indeed now, high-tech medical machines are playing role of physicians very often. Doctor-patient relationship is now revolutionarily changing. A new Doctor - Expensive High Tec - Patient triangle relationship should be established. Needless to say, how to maximize the number of enjoyable people is the most difficult problem.

6. The "Crisis" in Today's Medicine

Here I would like to introduce an outline of excellent description of Prof. Cecil G. Helman's *"Culture, Health and Illness"* (2007, page 104-5).

Today many believe that modern (Western) biomedicine is in crisis despite its many successes in preventing and treating disease, alleviating suffering, and increasing life expectancy. In recent years a growing public dissatisfaction has been reflected in increasing complaints against doctors, and litigation, media campaigns against the medical profession, and the increased popularity of non-medical and alternative healers.

There are several reasons for this. Modern medicine has largely eradicated the major killer infectious diseases in most Western countries and prolonged life-expectancy increased. However, as a result, more people are now living long enough

to suffer from the chronic diseases such as diabetes, hypertension, cancer, arthritis, neuromuscular disturbing, mental disorder and so on. Now we are living in an era of "revenge of the chronic".

At the same time, the costs of medical care are growing because of the escalating costs of hospitals, modern high-technology, drugs, medical bureaucracies, staff salaries, training, litigation and malpractice insurance. In most societies these rising costs exaggerate the effect of the unequal distribution of health resources in the population, dividing them even further into those that can afford full medical care and those that cannot.

Doctors in Western medical system are under going major changes in their traditional roles and in what is expected of them. Like other health professionals, doctors are now expected to be competent in a wide variety of roles. These include those of manager, education, computer specialist, bureaucrat, government (or medical insurance company) employer, technologist, writer, financial expert, businessman, judge, ethical expert, advocate for patients, family, friend and confident, as well as healer.

Often they are expected to behave as secular 'priest', in their own 'temples of medical science', even when they have no pastoral training to do so.

7. Roles of Health Care Professionals, Especially of Doctors

Health care professionals, especially doctors, are now expected to be competent in a variety of roles. These include those of being a manager of health care facilities or of hospitals, educator of medicine, excellent biomedical scientist / technician, computer specialist, biomedical ethicist, health-care bureaucrat, health insurance system specialist, health-financial specialist, and a protector of human rights, especially of patient's rights.

In many countries, furthermore, many doctors believe that "protection of environment, avoidance of terrorism, and abolition of mass-destructive ABC-weapons" are all their professional obligations.

Proposal of the Nous Self Concept as a worldview for the symbiotic integration of modern science

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1. Overview

In this paper, I try to explain in detail from a philosophical perspective the design of the Nous-Self concept.³ The most important viewpoint that is lacking in science is the linkage between the whole and part as well as the position and standpoint of each scientific domain as a whole. I attempt to show a linkage between the whole and part as well as position of each scientific domain in the whole with the Nous-Self Concept. This means symbiotic integration of worldview in various scientific domains with the Nous-Self Concept as a universal policy that can contribute to attainment of the Millennium Developmental Goals (MDGs) for construction of a sustainable society.

Symbiotic integration of science and philosophy with a comprehensive exploration needs collaborative work of a lot of diverse people rather than one genius for construction of sustainable society. Because, progress by collaboration of international diverse people rather than progress of only one genius can contribute to concrete construction of sustainable society. Though I will later write more scientific detailed evidence about the Nous-Self concept, I only propose the Nous-Self concept that becomes a foundation of a new worldview as a scientific and ethical direction for MDGs by arrangement of scientific concepts to edit various modern scientific domains with philosophy.

In short, I suggest the Nous-Self concept for contribution to universal policy concerning construction of sustainable society. The Nous-Self concept aims at one of fundamental frameworks for creation of new ethical standards. This is because the Nous-Self System is formed by systemic physiology as an organism. At the same time, the Nous-Self Process is formed by a process of interaction between consciousness and the social system.

In this paper, Nous shows the notion that links to the universe. Nous also shows infinite and self-rule by continuous motion of itself. At the same time, Nous shows the intelligence of living universe as noetic.

Self shows the notion that links to individual from the universe. Information shows the notion that links to transformation of form between Self and Nous for emergence and evolution between individual and universe. If the individual self with spatial structure has an open system as organism, individual self becomes a partial system of universe as whole system. If an individual self with spatial structure has nesting hierarchy as the being, individual self becomes the universe as itself. This means macrocosm and microcosm that cosmos exists outside and inside Self. Self with nesting hierarchy as the being has a boundless open system as the organism. Nous-Self concerns the form of organism as a notion.

The form of organism as a notion derives from metaphysics of Aristotle. Lancelot Law Whyte (1995) indicated that the form as a notion has the meaning of shape, configuration, structure, pattern, organization and system of relationships. Whyte (1995) indicated the need of natural philosophy for integration of spatial form in multiple process in physics, biology, psychology and art.

In the case of molecular biology, scientists consider that DNA base sequence operates and controls the form of organism. What operates and control the form of DNA base sequence throughout body?

In the case of biophysics, biophysicists considers frequency, wavelength, phase of wave and field as well as DNA base sequence operates and controls the form of organism. What operates and control the form of wave sequences?

In the case of sociology, sociologists consider that social system operates and controls form concerning organization of individual as organism. What operates and control the form of social system?

In the case of psychology, psychologists consider that cognitive system or the relationship between individual and others like another individual, society, transpersonal etc operate and control the form of individuality. What operates and control the form of individuality throughout consciousness?

The above concerns the holon structure of form concerning self-organization and self-sustainment. A confused state of modern science and technology as well as philosophy for underlying solution of ethical problem derives from lack of comprehensive direction to elucidation of mechanisms for linkage of each level concerning each holarchy like the above.

³ This paper also links to my contributions to report of Working Group 2 (Ethical worldviews of nature) and WG3 (visions and hopes of the nature) in Ethics and Climate Change in Asia and the Pacific (ECCAP) project in UNESCO Bangkok.

In other words, the one of the most important scientific enigma is a mechanism for linkage of each level concerning each holarchy like the above. In short, how does a level of holon link to other holons?

Thus enigmas go back to ancient Greek philosophy. For example, in the case of Aristotle, the key notion for solution of thus enigma is motion for organization of organism. Meanwhile, in the case of Plato, the key notion for solution of such an enigma is Idea as information for process of organism. In the case of cosmological perspective by Aristotle, while organism gradually repeated self-organization for generation of form in individual organism, all occasions in self-organization created a systemic process as wholeness in the limited space and time. In the case of self-organization by the organism, Aristotle emphasized the functional world rather than the geometrical world*. In other words, Aristotle had a scientific perspective as a functional system of organism.

The difference between functional world and geometrical world links to the difference between life as the being and the living creatures as the becoming. The life as the being links to the operation concerning motion. The living creatures as the becoming link to function concerning autocatalysis. The autocatalytic cycle becomes a system for adjustment of entropy for the becoming. The living creatures balance the decrease or increase of entropy concerning irreversibility i.e. adjustment between non-equilibrium and equilibrium needs the creation of autocatalytic cycles. This autocatalytic cycle creates function in the system. Multilayer functions as Energeia by autocatalytic cycle accelerate the self-organization as Enthelecheia. The process of differentiation of functions and differentiation of functions for self-sustainment creates spatial structures. This means that the one of the most difficult scientific enigma is elucidation of mechanism concerning emergence of autocatalyst.

By biological discovery and physical discovery, scientists of advanced system theory attempt to elucidate scientific enigma like the above by integration of notions between motion and information. In the case of physics, a Russian scientist, Ilya Prigogine (1980) who was familiar with ancient Greek philosophy including Aristotle and Plato, aimed to integrate the functional world and the geometrical world. In other words, he aimed to integrate between functional systems as organism and information theory with entropy as the dissipative structure theory that showed direction of advanced system theory. About the functional perspective of Aristotle, Prigogine

(1980, p.4) indicated as below: *"We see the progressive organization of a biological space in which every event proceeds at a moment and in a region that make it possible for the process to be coordinated as a whole. This space is functional, not geometrical. The standard geometrical space, the Euclidean space, is invariant with respect to translations or rotation. This is not so in the biological space. In this space the events are processes localized in space and time and not merely trajectories."* In short this suggests a dissipative structural theory as potential order and measure about irreversibility as well as systemic linkage in each holons of organic holon.

Ervin Laszlo (2004) suggested Akashic Field theory for integration of various scientific domains and thought as well as comprehensive direction for elucidation of mechanism for linkage of each level concerning each holarchy. Meanwhile, though Laszlo (2004) showed a process of linkage between individual and universe in his theory as well as comprehensive direction for solution of scientific enigma, he didn't show the process and system of organism concerning Self. Self becomes core of every occasion and phenomenon. Every occasion and phenomenon derives from the Self as organism.

Therefore, in this paper as a proposal of Nous Self concept, I aim my proposal of the fundamental vision of Nous-Self Concept by arrangement of notion of process, system and information in order to complement the Akashic field of Ervin Laszlo.

2. The self and care

The care concept by Takao Takahashi (2008) is an example of a holistic approach with cosmological inclination can be adapted to various scientific domains and social systems in order to aim at a concrete solution of ethical problems for future generations. Thus I aim to create a concept like Takahashi with a holistic integrative approach as a naturalist with cosmological inclination as contribution of philosopher to diverse society and people as well as nature.

The Nous-Self System is needed for research and development of medicine that are based the attribution of human-beings including systemic physiology of human-beings. Most ethical problems in material civilization derive from lack of perspective of systemic physiology as an organism in modern western science.

In the Nous-Self System, all occasions as continuance of moment affects systemic physiology. The self is center of all occasion. Therefore, I defined **self** as: *"The self is the synthesis that is created by momentary and continuous interactive relationship between*

society and individual organism that nature and cosmos enfolds."

Depending on the definition of self, I have designed a lot of diagrams, only some of these are included in this paper. My intention for construction of sustainable society is creation of a social system where human beings can harmonize with nature, diversified society and pluralist culture.

At this time, the core concept of the segmented scientific and philosophical domains is the self-concept. Then, systems theory is effective as a methodology for editing achievement by modern science and modern society. Because, at this time, only both self-concept and system theory are cross-sectional ideas in society, science and philosophy. By utilizing systems theory, for suggestion of new self-concept that can be utilized as actual universal policy, creation of self concept concerning systemic system as organisms is my goal. Because human beings are multicellular organisms that live in society on the Earth that is enfolds by the Universe. This means need of concepts of all systems including social system, natural system, cognitive system, etc. While utilizing the concept of all systems for elucidation of an organism, elucidation of systemic physiology in Nous-Self concept as an organism can link to the important direction of science and philosophy for actual contribution to construction of sustainable society.

Ervin Laszlo (1987) suggested Grand Evolutionary Synthesis as a direction of science and philosophy that can suggest actual construction of sustainable society by interaction between philosophy and science like my suggestion. He considered science that had a scientific system. Therefore, he indicated the need and idea of elucidation of scientific system for direction of social evolution.

As universal policy for construction of sustainable society, elucidation of systemic physiology as an organism is needed. For elucidation of systemic physiology, achievements of the segmented scientific domains is needed. Therefore for editing scientific components, I suggest a framework of Nous-Self concept by Nous-Self System and Nous-Self Process with achievements of system theory.

3. Nous-Self Process

The fundamental ethical problem derives from attribution of human-beings. For comprehensive explanation of the relationships between the fundamental ethical problems and attribution of human-beings, I had designed the following diagram while I consider the consistency of two diagrams and the flow about transformation of information concerning mechanism of formation of

occasion. Figure 1 illustrates the Nous-Self Process. Figure 2 illustrates the Nous-Self System.

I have already explained the theoretical background about the foundation of Nous-Self Process as process of self in my paper (Uejima, 2008). Individual self as atman with microcosm is the integration of various social holons including process as part in whole which has subordinate and integrative function to the upper holon as social humans. Human beings each have a social holon.

- 1) Economic holon: economic material value that links to reward and benefit.
- 2) Political holon: belief that links to control of someone by acquirement of power.
- 3) Educational holon: educational morals that links to relativity.
- 4) Diversity holon: there is relief by belonging that links to stabilization and dependence of mind.
- 5) Bio organization holon: Body awareness in body with spatial space as organisms concerning psychophysical operation
- 6) Earth holon: collective unconsciousness, soul and nature as cooperative by organic network
- 7) Universe holon: Spirit, Oneness, Emptiness, Nothingness, Something Great as creation by universe

From 1-4 compose social holons, while 5-7 compose the Organic holon. Meanwhile, there is a boundary zone in the process between social holon and organic holon. The boundary zone shows the limitation of cognitive system with system of perception in species. In addition, a boundless zone in process means the initial boundary conditions of boundary from boundary to infinity. The initial boundary conditions of the Universe are that it has no boundary. This boundless zone also means not only philosophical differences between metaphysical concepts and empirical concept but also the biggest scientific enigma for elucidation of scientific mechanism for formation to substance from wave for formation concerning emergence and evolution^{*1}.

Furthermore, I add the following explanation about holons that human-being can recognize as occasion by cognitive phase transition of information^{*} with "Nous-Self Process" that I had designed as matrix.

- (1) Physical transition of information concerns formation of social holon.
- (2) Molecule transition of information concerns formation of holon of bio- organization and holon of earth in organic holon.
- (3) Causal and subtle transition of information concerns formation of holon of universe.

When we observe ethical problems of medical ethics and bioethics as well as environmental ethics with Nous -Self Process, we

can understand the gap between the social holon of the above boundary zone and organic holon of the below of boundary zone (Figure 1). In short, though the organic systemic system that emerges in life concerns organic holons, a social system focuses on social holons. Though ethical problems concerning medical ethics and bioethics as well as environmental ethics derives from disharmony between organic holon and social holon, as far as social system keeps on focusing on developments of social holon, humans cannot solve fundamental ethical problem.

By the way, Gregory Bateson (1979) showed that information is any difference that makes a difference. In other words, our perception can recognize only information as difference. In the case of our perception concerning affordance as remarks of J.J. Gibson (1979), we can recognize information as difference that various perceptions as the observer configure in a dynamic process of communication between the environment as objective others and subjective self with spatial structure. Thus perspectives show viewpoints as observers. We can recognize each object by relative comparison of object as differentiation.

In short, our cognition needs to classify objects in nature with the essence of wholeness by differentiation. The classification with thus cognition becomes the viewpoint of the observer. Our cognition has the limitation of perception as species. It is important that we always awake our cognition about classification of occasion including nature. Therefore, about classification by our cognition as viewpoint of observer, each color in Nous-Self Process (Figure 1) shows the object that we recognize and classify.

If we lose perception or transform perception, what can we recognize in occasion including nature? One of answers to this question folds in our recognition with condition of coma as remarked by Arnold Mindel (1989).

4. Nous-Self System

4.1. Philosophical ideals

Philosophy emerges from culture, religion, mythology and lifestyle in a diversified society. Philosophy is folded in society. Therefore, philosophy affects the mindset of human-beings. As a result, philosophy affects behavior of human-beings. Philosophy affects the meta cognition of people. After Takao Takahashi (2001) investigated the influence of philosophy to students in high school, he discovered some concept of modern western philosophy affected the value of Japanese youth regardless of awareness. Thus influence of modern western philosophy to youth shows the possibility that affects to meta cognition of scientists. Therefore, suggestion of direction of

philosophy as well as science is the most important.

The suggestion of a new worldview for direction of science and the intention of construction of sustainable society is the most important role of philosophy. This also is the most important purpose of ethics.

(1) The distinction between modern western philosophy and eastern philosophy

At first, a simple distinction between modern western philosophy and eastern philosophy is in Table 1.

Table 1: The difference of concepts between modern western philosophy and eastern philosophy

Modern western philosophy	Eastern philosophy
➤ Dualism	➤ Monism
➤ Reductionism	➤ Holism
➤ Rationalism	➤ Intuitionism
➤ Materialism	➤ Organismic
➤ Humanism	➤ Cosmology
➤ Analytical	➤ Holistic
➤ Individuality	➤ Community
➤ Happy as individual	➤ Harmony as whole
➤ System	➤ Process

The origin of modern western philosophy as well as modern science was Ancient Greek philosophy. Ancient Greek philosophy had both characteristics of Table 1. Meanwhile, the origin of Eastern philosophy is Indian philosophy. Of course, religion, mythology, culture and lifestyle of diversified society affected the philosophy of each nation. Therefore, derivation of two mainstreams became religion, mythology and culture of each nation. However, characteristics of philosophies in diversified minorities of Mongoloids are close to eastern philosophy. From an anthropological viewpoint, traditional philosophy in the world had an organic perspective as the characteristics of eastern philosophy. In short, organic perspective of eastern philosophy leaves behind the archetype of human-beings. Khroutski (2007) indicates that distinction between modern western philosophy and eastern philosophy has distinctions between rational and realistic.

Secondly, Table 2 shows achievement and detriment of material civilization. Material civilization that I use adapts to sensate culture by Pitirim A. Sorokin (1941). He indicated that the first generation of sensate philosophy was Descartes, Lockes, Kants, Humes or Comtes. The second generation was scientific philosophy and ideational or idealistic system by potential Kants and Humes of philosophy. The linkage between modern philosophers since Descartes and modern

scientists since Newton affects development and problem of modern material civilization in Table 2.

The detriment by modern material civilization concerns the lack of concepts of eastern philosophy that Modern western philosophy lost or downplayed. Meanwhile, achievement by modern material civilization is based on contribution to modern western philosophy. This means the limits of modern western philosophy, material civilization and modern social systems.

The distinction between modern western philosophy and eastern philosophy means the possibility that relationship between modern western philosophy and eastern philosophy becomes gestalt in social cultural system. This means that the relationship between modern western philosophy and eastern philosophy becomes relationship between yin and yang.

4.2. Transcendence of material civilization by symbiotic integration of modern western philosophy and eastern philosophy

The symbiotic integration of western philosophy and eastern philosophy can contribute to transcendence of material civilization. This is the most important task in modern philosophy. In spite of Preference Utilitarian, Singer (1993) indicated need of cosmological perspective for transcendence of self as social animals in ethical perspective. However, his cosmological perspective is similar with cosmological perspective in pure reason of Kant. In short, Singer as well as Kant focuses on process of consciousness for solution of ethical problem.

Pitirim Alexandrovich Sorokin (1965, p.842) indicated prognosis of the shape of integral sociology to come as future direction of sociology and he suggested a supersystem for transcendence of sensate culture.

At first, for symbiotic integration between accomplishments of modern western philosophy and eastern philosophy, I utilize the mind-set of yin and yang in Tao. Chinese traditional philosophy like theory of yin and yang and the five elements thought yin and yang as worldview. Yin and yang is close to thought of gestalt in cognitive process of western thought. Though gestalt concerns cognitive principle for influence of dualism, Yin and yang as holistic and cosmological approach means fundamental principle that constructs human, society and nature that is enfolded by cosmos. Yin and Yang emphasize balance as whole that means holistic harmony. In this paper, I emphasize balance as whole between modern western philosophy and eastern philosophy for suggestion of new mind-set for science and policy.

Secondly, for symbiotic integration of modern western philosophy and eastern philosophy as

well as ancient Greek philosophy and philosophies of diverse minorities, I attempt creation of new self concept. Self also is a core scientific concept. Therefore, creation of new self concept can link to not only symbiotic integration of diverse philosophy but also various scientific domains. Indian philosophy like Advaita philosophy of Sankara elucidates all occasion in process of Self with universal approach including integrative, holistic and cosmological perspective. Eastern philosophy considers self as process in nature and cosmos as evolution for creation including light and shadow like Shiva or Tao or Nothingness as Mu or Wu or Bhava. Meanwhile, "Know of thyself" was philosophical theme by sophists including Socrates.

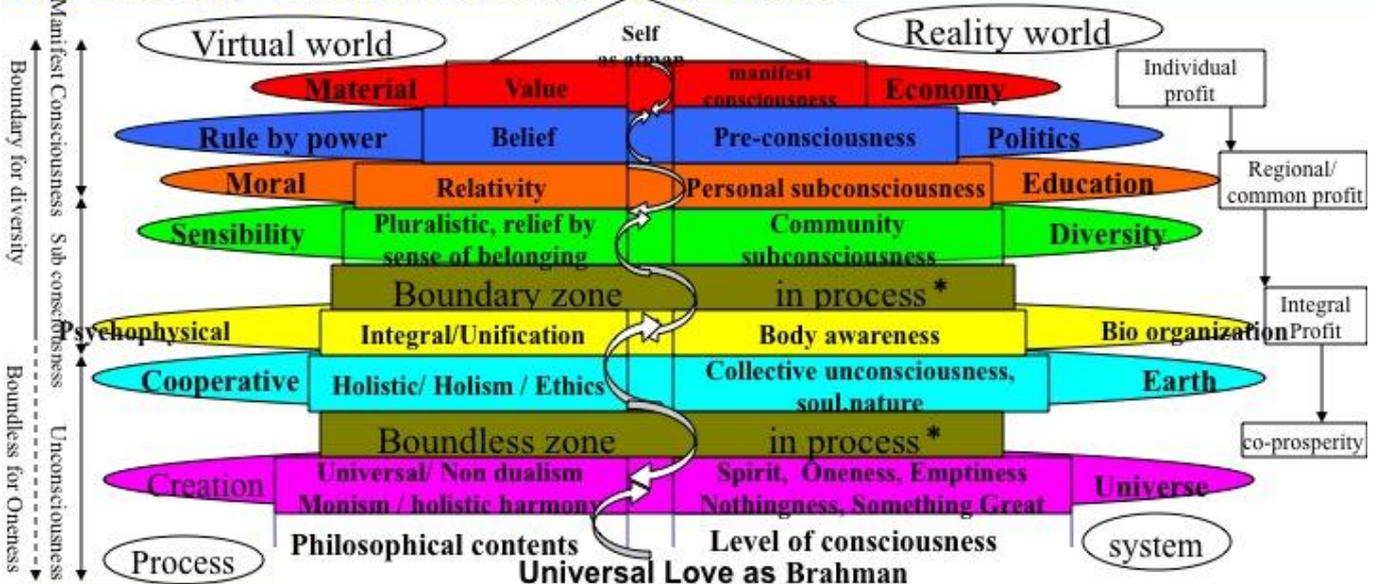
Thirdly, I use a genealogical chart of system theory. The origin of system theory was Aristotle. While system theory affects philosophy, system theory contributes logical direction and symbiotic integration of science. At the present, a core idea of system theory is an open system. However, in spite of suggestion about open system, classical system theory elucidates classical open system with boundary. This logic is inconsistent. The inconsistent idea of classical system theory is derived from reductionism of modern western philosophy. If scientists of system theory explore logical open system, they need to consider interaction between universe and individual self as well as social system, natural system and cognitive system. Thus inconsistent idea is the potential task in modern science. Because, this potential task is derived from a lack of mindset of metaphysics or cosmology. For solution of this problem, Laszlo (1980) founded system philosophy.

Fourth, for transcendence of scientific mindset, symbiotic integration between modern western philosophy and diverse philosophy is needed. For transcendence of scientific mindset, I suggest elucidation of Nous-Self System with systemic physiology. Nous is word of Ancient Greek philosophy. Curd (2007) indicated the meaning of nous that Anaxagoras suggested at the first: "*Nous has control over all things that have soul, both the larger and the smaller.*" This suggests not only a perspective that Anaxagoras took the actions of humans and animals as the model for how nous controls the cosmos, but also a perspective that nous differs from the other ingredients. This is the nous that Aristotle, Plato, Anaxagoras indicated concerns cosmology and metaphysics. Nous-Self System as my suggestion becomes the reinstalling of metaphysical and cosmological concept in scientific concept that modern science rejected for oppression by Church as a remark of Erwin Schrodinger who was

Table 2: Some achievements and problems caused by material civilization concerning modern western philosophy

Achievements with modernization by modern western philosophy, science and technology (Achievement by material civilization)	Detriment with modernization by modern western philosophy, science and technology (Detriment by material civilization)
<ul style="list-style-type: none"> ➤ The development of science and technology ➤ Much knowledge by modern science ➤ Many artificial materials by science and technology ➤ Virtual linkages by information technology ➤ A material rich, convenient and comfortable lifestyle ➤ Rich and convenient lifestyle by using much material and energy ➤ The progress of globalization by development of capitalism ➤ Stabilization of democracy ➤ Expansion of western ideas and civilization with capitalism and democracy by globalization ➤ Spread of centralist and bureaucratism ➤ Human dignity and Human Right ➤ Spread of modern education and English ➤ Spread of western medical care 	<ul style="list-style-type: none"> ➤ Social problem that cannot be controlled by domestic and international law and moral (e.g. use of atomic weapons in war) ➤ Destruction of environment ➤ Discrimination of minorities concerning identify of cultural and ethnic communities ➤ Decline of social responsibility ➤ Growing economic disparity ➤ Collapse of culture and rural community ➤ Lack of linkages and communication to wild nature ➤ Decline of real sense of life and community as a natural creature ➤ Decline of body awareness and functions as natural creature ➤ Decline of spontaneous healing ability as natural creature ➤ Lack of holistic wisdom as like Tao and a sense of ethics

Fig 1: Nous- Self Process with nesting hierarchy as matrix



*1 Boundary zone express instinct of species. Boundary zone shows the limitation of cognitive system with system of perception in species.

*2 Boundless zone in process means the initial boundary conditions of boundary from boundary to infinity. The initial boundary conditions of the Universe are that it has no boundary.

We can observe that partial system has each autonomy order. However, if we observe linkage between partial system and whole system, we can understand systemic linkage that has interdependent order. Arthur, Koestler (1978) indicated that thus orders are fundamental structure of holon

This nesting hierarchy means holachy with holon structure. The each color shows each holon. This diagram shows process concerning emergence of self by philosophical contents as thought. At the same time, This also shows process concerning emergence of self by natural system, psychological system and social system as organism. In sum, This diagram can link process and system for emergence of self of individual self with microcosm as atman from macrocosm as Nous Self.

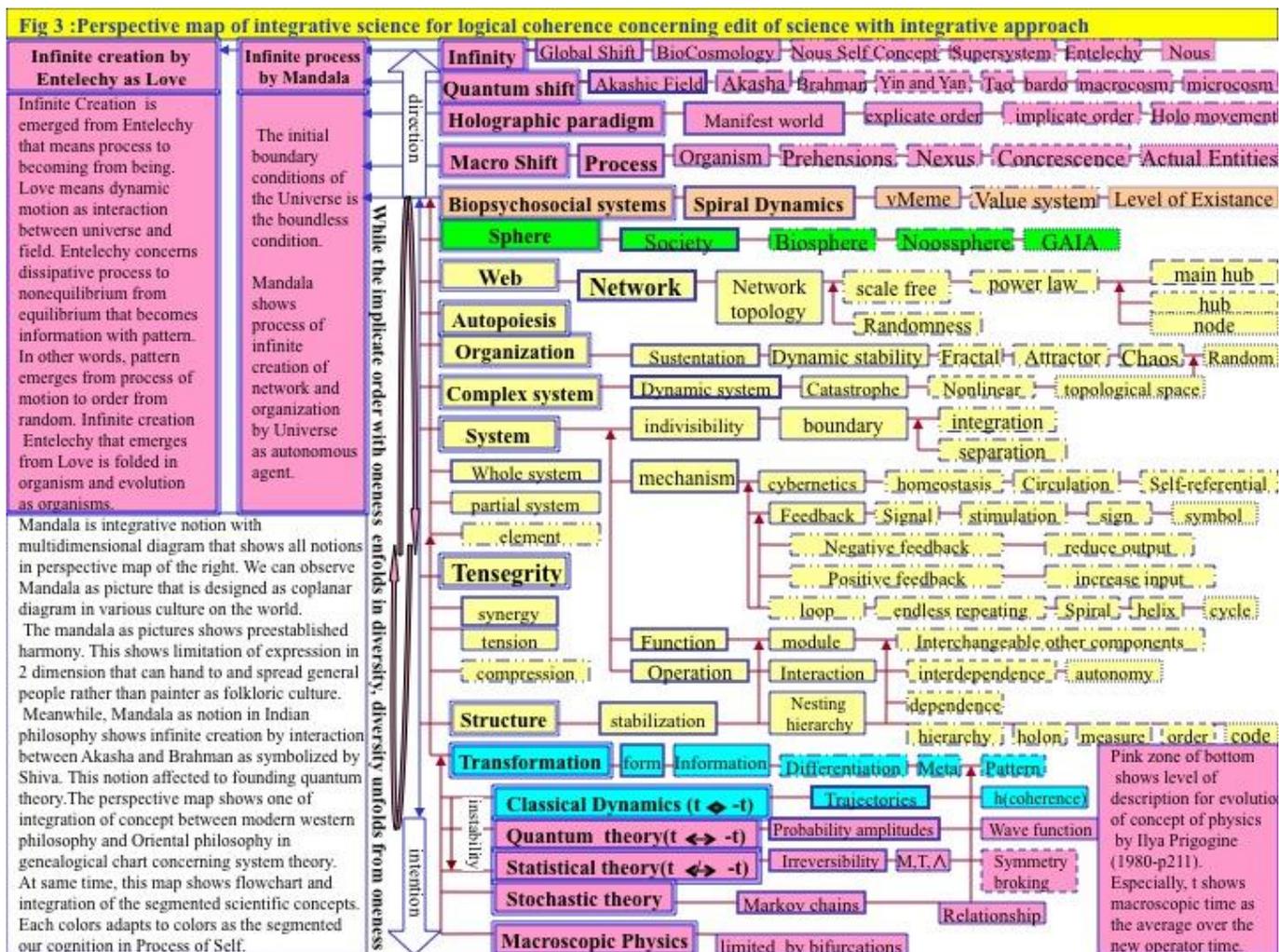
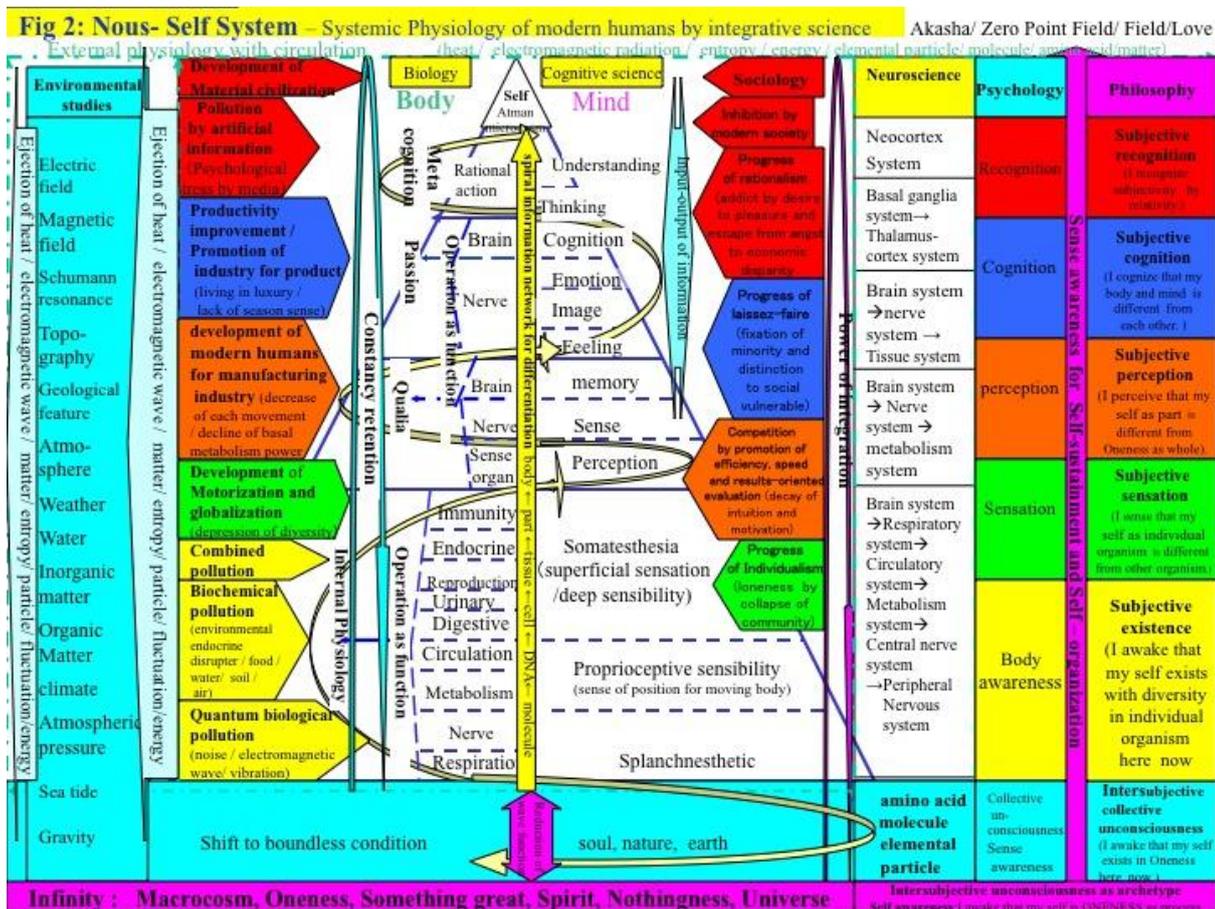
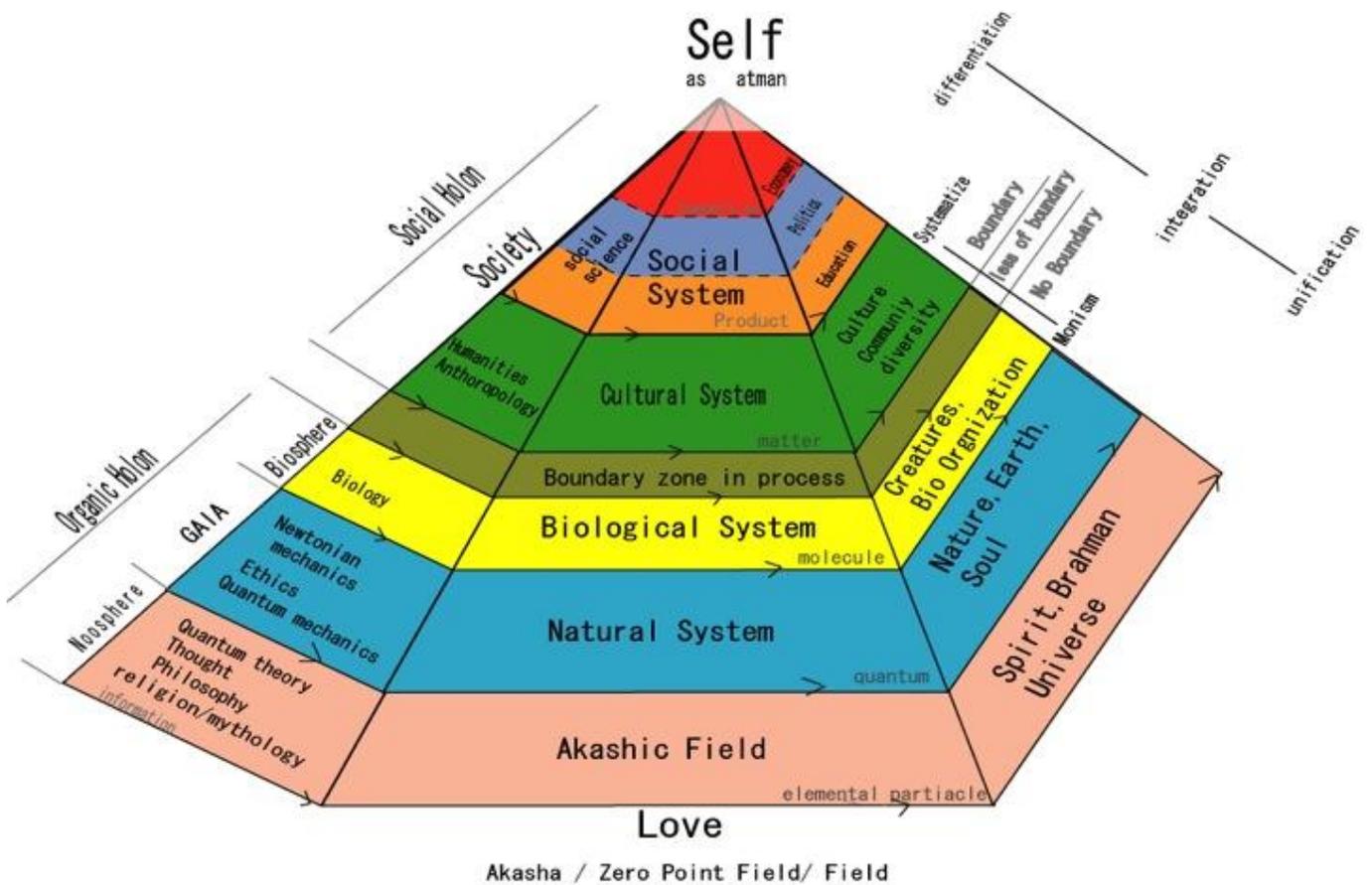


Fig 4: Conceptual schema of science and thought by Nous -Self concept for Symbioses as Integration of science and thought by nesting hierarchy of self



the founder of quantum theory or a remark of Georg Henrik von Wright.

Founders of quantum theory like Erwin Schrodinger, Georg Henril von Wright and David Bohm were affected by Indian philosophy. W.K. Heisenberg who was founder of quantum theory was affected by ancient Greek philosophy. Quantum theory was derived from mindset of Indian philosophy and ancient Greek philosophy. George Henrik von Wright (1981) indicated a direction for explanation of science transcendent that concerns metaphysics. While Sorokin (1965) traced about view concerning consciousness by authority of quantum theory, he prefigured that development of quantum theory affected not only social system but also socio cultural system.

The symbiotic integration between modern western philosophy and oriental philosophy as well as suggestion of Nous-Self concept aims to show direction of science and policy for construction of sustainable society in order to aim to contribute achievement of MDGs.

5. Ethical significance of the Nous-Self System

The hypothesis of Nous-Self System with systemic physiology of human-beings as organisms has mechanisms for external sustentation as external physiology and mechanism for internal sustentation as internal physiology concerning homeostasis in body as spatial structure. Konstantin Viktorovich Sudakov (2008) tried to demonstrate system quanta that meant specific operators in the dynamic activity of the organism's functional systems discovered by P. K. Anokhin with scientific experiments about neurophysiological and neurochemical mechanism.

In our time, material civilization that is based on material consumption including process for supply of product and energy has spread in the world by globalization from westernization. Material civilization gives not only efficient and convenient lifestyle with rich products but also spreads economic disparity. Meanwhile, modern humans keep on losing not only body awareness but also contact to nature and various physical motions by work and

ambulation in modern lifestyle. As the result, modern humans keep on losing physiological function for sustentation of homeostasis concerning spontaneous healing system.

Though science can contribute to development and spread of material civilization, science cannot show fundamental methodology of ethical problem like destruction of community and communions of environmental destruction and chronic disease.

Science emphasizes scientific evidence as a quantity for reproducibility by linkage with technology. As the result, most scientists also research physiology in partial systems with the controlled experimental laboratory and laboratory animals or the simulated model by computer. Scientific evidence concerning physiology that is developed and discovered with the controlled experimental laboratory and laboratory animals or the simulated model by computers becomes fundamental of product and technology including drug and medical technology. The research of evidence as a quantity in a short period concerns the relationship between a partial system and physiology in a controlled experimental laboratory is not more difficult than research of evidence as quantity in relationship between the actual whole system and physiology.

In the latter situation, one of scientific methodologies is epidemiological study. Though epidemiological study generally is designed after emergence of some ethical problems like pollution or environmental assessment for scientific judgment in court or policymaking, due to difficulty in reproducibility as epidemiological studies tend to be considered more weaker than scientific evidence gathered in the controlled experimental laboratory. However the results will be different when they derive from differences between a whole system and a partial system as a topic for investigation or research.

For example, as damage by pollution links to damage of the whole system, epidemiological study or environmental assessment treats the relationship between physiology and whole system as possible. Neil Cherry (2001) wrote an environmental assessment for a lot of people including victims in the world^{*2}.

The bias becomes a problem in epidemiological study and environmental assessment. Especially, the problem of bias concerns cognition of victims about pollution. For example, if victims are familiar with pollution, a victim might claim more serious damage about pollution which is a bias. This shows that science focuses on natural system that is based on quantity as physiology of human-beings by influence of dualism and rationalism. Actually,

human-beings have both natural system and cognitive system as well as a sociocultural system as an organic system. Therefore, response of body by knowledge of pollution and recognition of stress for emergence of social problem like pollution is normal. However, most scientists or physicians downplay bias as a problem of mentality caused by trauma that affects the response of victims.

In short, this shows lack of ethical awareness in scientists or physicians as well as ethical problems in science caused by dualism and reductionism that has the trend of reduction to individual problem in spite of whole social problems. Scientific explanation by quantity about response or narrative of victims is difficult. Because, trauma and narratives of victims contain relationships between the whole system and pollution concerning damage, statistical analysis that is based on deviation by linearly analysis with quantity of partial system in a short period that scientists or physicians utilize in epidemiological study and environmental assessment cannot describe transformation in nonlinearly dynamic process of whole system in long period. The consistency between nonlinear phenomenon and linearly statistical analysis becomes a mathematical task. Instead, there is case that origin of transformation in individual data rather than the analyzed data shows transformation of whole system. Because each individual has wholeness. Furthermore, when scientists select analytical methods, subjective assessment by scientists affects the selection of analytical method and data for analysis. This analytical method and data by scientists becomes an ethical bias rather than bias concerning recognition of victims.

In sum, it is difficult that science controlled by dualism and reductionism deals with problem concerning whole system. After Jahn and Dunne (2001) classified science concerning interaction between mind and matter consciousness as tangible physical module (module T) and coconscious mind module(module C), they indicated the limitations of science concerning materialistic view and need of comprehensive quantitative science.

The proposal of direction for transcendence of the above limitations of science by reductionism and dualism is elucidation of systemic physiology as Nous-Self system. The transcendence of limitation of modern science can contribute to construction of sustainable society. This means targets of integrative science as science of ethics. Systemic physiology as Nous - Self system is useful for epidemiological study or environmental

assessment as well as design of policy for construction of sustainable society.

The actual systemic physiology also closely relates not only to the natural environment but also socio culture.

4.4. Perspective map for suggestion of Nous-Self System (Figure 3)

1) Philosophical significance of perspective map

My purpose of perspective map is close to the following suggestion of Werner Karl Heisenberg (1984) who discovered the Uncertainty principle in quantum theory, who lamented the circumstance that physics was imitated in modern philosophy by boundaries, and he indicated that scientists needed research in the limited domains. Then, while he suffered for contributions to development of atomic bomb in Germany in his youth, he indicated that balance between scientific truth and religious truth needed for integration in self and for ethical solution by development of science and technology.

While George Henrik von Wright (1981) recognized the significance about causal explanation, he indicated attribution of domain by causalist like Wiener is function, purpose (fullness), and organic whole (systems) in biology. Scientific elucidation of the natural system is facilitated by development of biophysics as well as development of molecular biology for development of observation equipment of quantum. Therefore, Nick Lane (2000, p.571) indicated a distinction between physicists and neuroscientists. Lane indicated that quantum physicists tried to elucidate consciousness for failure of providing a physical basis for consciousness by molecular biology.

Karl H. Pribram (1982, p.29-30) who is founder of the holographic model of brain indicated the relationship between mentality and brain about fundamental problem concerning observer of natural science as below:

“(1) Brain, by organizing the input from the physical world, as obtained through the senses, constructs mental properties.

(2) Mental properties are the pervasive organizing principles of the universe, which includes the brain.

Paradoxically, almost all behavioral and neuroscientists would today subscribe to some form of statement one, while, as noted above, statement two reflects the belief of many of the most influential theoretical physicists. Mathematicians have faced the dilemma more directly: how is it that the operations of their brains so often describe faithfully the basic order of the universe they perceive? “

Thus the distinction between quantum biologists and molecular biologists is distinction of research topic by their mindset concerning their worldview concerning philosophy in scientists¹. Therefore, if symbiotic integration of their research achievement is possible, what scientific perspective can we get? For suggestion of Nous-Self System to scientists from my standpoint as a philosopher, I designed a perspective map (Figure 3) for expression of flow-chart of concept on the base of logical consistency and mind-set concerning scientific idea of scientists concerning system theory with their autobiography as well as the paper of scientists. In the case of logical consistency, each scientific concept shows modules in the scientific system as one of the cultural systems. In short, if we think of science as a scientific system, each scientist becomes an element as well as scientific domain becomes partial system in scientific system. Because science is one of partial system in social cultural system as remarked by Sorokin (1965) and Ervin Laszlo(1987).

One of the important roles of philosophy is holistic arrangement of scientific knowledge and suggestion of scientific direction. Because philosophy becomes one of meta cognition in scientists. Only verbal expression has limitation for handing on and spreading. Therefore, I designed perspective map as methodology for elucidation of Nous-Self System by collaboration of diverse people on the future. For suggestion of the direction of science on the future, nobody can keep on sustentation of logical coherence by collaboration between scientists and philosophers for a long period without a flow-chart concerning definition of each scientific concept by diagram. I had designed perspective map for symbioses as integration of science and philosophy as well as relationship between science and philosophy by cognitive process of human-beings by literature study as philosophical method.

Philosophical concepts are folded in scientific concept. Scientists utilize philosophical ideas and philosophical concepts in order to develop and discover new domains of science. Meanwhile, a lot of scientists that are familiar with philosophy indicated limitation of science. The concept of Autopoiesis that Humberto Maturana and Francisco Varela suggested derive from auto – αὐτό for self- and poiesis – ποίησις for creation or production by Aristotle.

Hence, holistic arrangement of modern scientific concept is possible by investigation of mind-set concerning meta cognition of scientists with word as scientific concept in paper and their

idea in their autobiography. Of course, holistic arrangement of all modern scientific concepts is impossible by myself. Therefore, I focus on some frequently-used concept in genealogical chart of system theory that shows scientific relationship between whole and part segmented scientific domain.

Explanation and construction of framework of Nous-Self System needs achievements of modern system theory and a full scientific explanation of the concept is being published separately.

I designed a Conceptual schema (Figure 4) of science and thought by Nous-Self concept for symbioses as Integration of science and thought by nesting hierarchy of self for integration of science. Each colour in the conceptual schema adapts to each colour of Nous Self process as cognition of human-beings.⁴ I designed the perspective map and Nous-Self System as base of classification of each holon with holon structure of conceptual schema.

The perspective map (Figure 3) is a flow chart of each concept in nesting hierarchy with holon structure of concepts itself by meta cognition and mindset of scientist and philosophers that I read and elucidated. Therefore, the definition of each concept shows the process of concept of right side and lower level. Furthermore, concepts of lower pink color show concepts that are developed by quantum theory in genealogical chart of physics. Concepts of yellow colour show concepts that are developed by system theory in genealogical chart of biology. Concepts in green show concepts that are developed by environmental science in genealogical chart concerning solution of environmental problem. Concepts in orange show concepts that are developed by sociology and psychology like the biosychosocial system by Don Edward Becknd and Clare W. Graves that is frontier of social system in genealogical chart concerning solution of social problem.

Information concepts in blue show concepts that are developed by information theory that develops interdisciplinary domain of mathematics, physics, neuroscience, biology, engineer, cognitive science and social science in spite of background of mathematics and electronic engineer. In other words, information concepts including concepts concerning dissipative structure are bridge concept that can link to mathematics, biology, psychology and physics including Newton mechanics and

Quantum mechanics or natural system, cognitive system, social system.

Concepts of darker pink show philosophy or thought concerning Nous-System theory that describes circulation of flowing of meta cognition of scientists and philosophers between philosophy and quantum theory in perspective map.

5. Discussion

The operational implications of the theory are further explored in another paper. Here we can discuss some of the implications.

At the present, modern science can elucidate process, network, structure and function in partial system or element with statistic or objective and scientific proof in elaborate designed experiment and calculated method. Though demonstration about the mechanism of the whole system that can be integrated into natural system, cognitive system and social system with objective quantity is difficult, I attempt to integrate natural system, cognitive system and social system by Nous-Self system with systemic physiology as hypothesis.

Since systemic physiology of human beings has a dynamic web of networks and multilayered loops that is formed by linkages of complex systems, distinctions between molecule biology and quantum biology mean different observations to gradual transition in process concerning transformation of information. This difference shows the following distinction of perspective about self-concept.

In the case of molecular biology, this considers interaction between the living creature and natural environment. Meanwhile, in the case of quantum biology, this considers interaction between the living creature and external environment including nature and universe as well as Fields. The distinction of both derives from difference in the viewpoint as observers. While perspectives of molecular biology and quantum biology have lack of perspective of interaction between society and living creature, Luhmann (1981) focused on elucidation of mechanism of social system in society without perspective about interaction between society and nature as well as cosmos.

Thus modern western science with reductionism causes new ethical problems about enhancement of human-beings as species concerning spread and development of new technology like nanotechnology. Wolbring (2009) indicated a need for a much broader, holistic analysis of the impacts of science and technology developments as direction of

⁴ Refer to the pdf file of the electronic version of *EJAIB* for colours.

human-beings as species and relationship between human-beings and other species.

Khroutski (2006) emphasizes elucidation about process of interaction between society and nature as well as cosmos for future direction of science and philosophy. Laszlo (2004) aims to integrate accomplishments of molecular biology and quantum biology as well as sociology and physics. The actual occasion in actual reality world emerges from multilayer loops that is formulated by complex and hierarchical linkages in element, partial system and various networks like Nous-Self system (Figure 2). A system with structure that means the integral of the order and measure for formation of organization repeats functional transformation for sustentation of organization.

Conclusion

In this paper, I suggest the Nous-Self concept as a new worldview for construction of a sustainable society. The Nous-Self concept is composed with Nous-Self process and Nous - Self system.

At first as my conclusion, in the case of systemic physiology of Nous-Self system, systemic physiology concerns scientific elucidation of spontaneous healing system and process of coma. The elucidation of spontaneous healing system and process of coma show the direction of medicine for actual construction of sustainable society.

Second, I hope that the scientific philosophical elucidation about mechanism of Nous-Self concept by collaboration of diverse people in the world as well as linkage of diverse people for elucidation begins to show a way like Tao for tangible construction of suitable society. Konstantin S. Khroutski indicated the important intention about harmony between holistic approach and reductionism as below in peer review of this paper: *"We need not transcend reductionism, but need to develop our holistic approach in symbiose with reductionism, taking its useful results as the means for the realization of the goals of Nous-Self System constructions and Nous-Self Process effects."*

The spread and development of symbiotic integration of science and philosophy for harmony as whole can gradually construct actual sustainable society. Finally, I suggest the final ethical target of Nous-Self concept as Love becomes fundamental for self-awareness as new ethical standard with daily ethical practice that diverse individual people gradually create sustainable society in each lifestyle and society. Because Love is folded in life as remarks of Darryl Macer (1998).

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Acknowledgements

Since first design of Nous Self System as diagram and concept 6 years ago for solution of environmental ethical problem and construction of sustainable society, I keep on researching the mechanism of Nous Self System by achievement of modern western science and philosophy in diverse people. Of course, I recognize that I cannot elucidate the precise scientific mechanism of the Nous Self System with comprehensive philosophical perspectives. Therefore, a lot of diverse experts around the world have educated and supported me. I recognize that I cannot suggest the Nous Self System in this paper without collaboration by diverse people.

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Malaria and Sterile Insect Technique (SIT): Pathogenicity, Perceptions, Misconceptions and Practices of Control in a Developing Nation

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1. Introduction

The feeding habit of several insects has been linked to several diseases that plague humankind today. Among these disease vectors is the fatal human malaria infection which is initiated when an infected female Anopheline mosquito –*Anopheles gambiae*, injects sporozoites during a human blood meal. After injection, sporozoites enter the bloodstream and go to the liver, where they invade hepatocytes and develop into exoerythrocytic forms (Coppi et al., 2005). These liver stage parasites mature and are released into the Red Blood Cell (RBC) for erythrocytic stage, a form characterized with symptomatic malaria. Four species of the genus *Plasmodium* are responsible for the human malaria out of which *P. falciparum* stands out as the most lethal compared to *P. vivax*, *P. malariae* and *P. ovale*.

Plasmodium species is a protozoan parasite that infects approximately 500 million people annually, killing more than one million, mainly children and pregnant women in Africa. Evolving drug resistance involving *Plasmodium*

falciparum strains and insecticide resistance of the female *Anopheles* mosquito account for major obstacle against all efforts to eradicate malaria in Sub-Saharan Africa (Osamor, 2009; Le Roch et al., 2003) and several parts of Asia, except Maldives which is malaria free since 1984 (WHO, 2009). Malaria is endemic to more than 100 countries and by far the most costly in terms of human health causing major losses among many African nations including Nigeria. Four of the countries in the South East Asia accounted for 97% of the estimated cases in the region in 2008 (Bangladesh, 10%; India, 55%; Indonesia, 15%; and Myanmar, 17%). Infection in most of these area are due to *P. falciparum*, although the proportion varies by country; transmission is due almost entirely to *P. falciparum* in Myanmar and Timor-Leste but due exclusively to *P. vivax* in the Democratic People's Republic of Korea (WHO, 2009). This article reviews the pathogenicity of infection and the numerous perceptions and misconceptions affecting modern control efforts including SIT for eradicating the disease among developing nations of the world.

2. Malaria Transmission and Pathogenicity

When a parasite-infected mosquito feeds on a human, it injects the parasites called sporozoites from its salivary gland into the subcutaneous layer of the skin and into the bloodstream. These migrate to the liver cell forming a quiet liver stage parasite in the parasitophorous vacuole. The co-receptor on sporozoites that mediates invasion involves, in part, the thrombospondin domains on the circumsporozoite protein (CSP) and on thrombospondin-related adhesive protein (TRAP). These domains bind specifically to heparin on hepatocytes. Inside the hepatocyte, each sporozoite develops into tens of thousands of merozoites (Miller, et al. 2002), which can each invade the red blood cells (RBC) on release from the liver.

Furthermore, the blood stage parasites grow and multiply severally, invading many more RBC and releasing the metabolic products arising from RBC degradation and leading to malaria symptoms. To commence sexual stage development, some merozoites undergo several developmental stages namely ring and trophozoite stages and finally differentiate into gametocytes which are picked up by blood-sucking mosquitoes during a bite on an infected person. Eventually, up to 10% of all red blood cells becomes infected and patients' may begin the manifestation of clinical features of malaria, including fever and chills, anaemia and cerebral malaria which can lead to death in case of

Plasmodium falciparum from female anopheline mosquitoes.

On each mosquito bite of an infected human, it takes up blood containing gametocytes, which develops into male and female reproductive cells (gametes) in the mosquitoes gut, and fusion occurs to form a zygote. The zygote in turn develops into the ookinete, which crosses the wall of the gut and forms a sporozoite-filled oocyst. When the oocyst bursts, the sporozoites move to the mosquito’s salivary glands, and the process begins again (Wirth, 2002).

2.1 Red Blood Cell (RBC) Invasion

In respect to RBC invasion, Miller et al. (2002) noted that what remains completely unknown is which merozoite surface molecules recognize the RBC surface and then signal the start of the invasion process. The parasite induces a vacuole derived from the RBC’s plasma membrane and enters the vacuole. Three organelles on the invasive (apical) end of the parasite (rhoptries, micronemes and dense granules) define the phylum Apicomplexa. Receptors that mediate invasion of RBCs by merozoites and invasion of liver by sporozoites are found in micronemes, on the cell surface, and in rhoptries. Identifying the signalling pathways that release organelle contents on contact with a host RBC is a critical issue in parasite biology. Invasion events include

releasing essential molecules from apical organelles and initiating the actin–myosin moving junction that brings the parasite inside the vacuole that forms in the RBC.

Although other parasite proteins on the merozoite surface and in apical organelles have been proposed as receptors, there is no direct evidence so far. Because invasion is such a complex series of events from RBC binding, to apical reorientation, to entry, it seems likely that several proteins are required for efficient invasion. For example, evidence has suggested that RBC invasion requires the cleavage of a surface protein on the RBC by an unknown parasite serine protease. Thus, the molecular and cellular events surrounding each step in invasion still remain to be elucidated. Understanding these pathways will give insight into parasite virulence and will facilitate rational vaccine design against merozoite invasion. A single parasite protein, *P. falciparum* erythrocyte membrane protein 1 (PfEMP1), which is expressed at the infected erythrocyte surface connects parasite binding to all the various receptors. PfEMP1 is encoded by the large and diverse var gene family that is involved in clonal antigenic variation and has a central role in *P. falciparum* pathogenesis. Adherence protects the parasite from destruction, as non-adherent mature parasitized RBCs are cleared rapidly in the spleen.

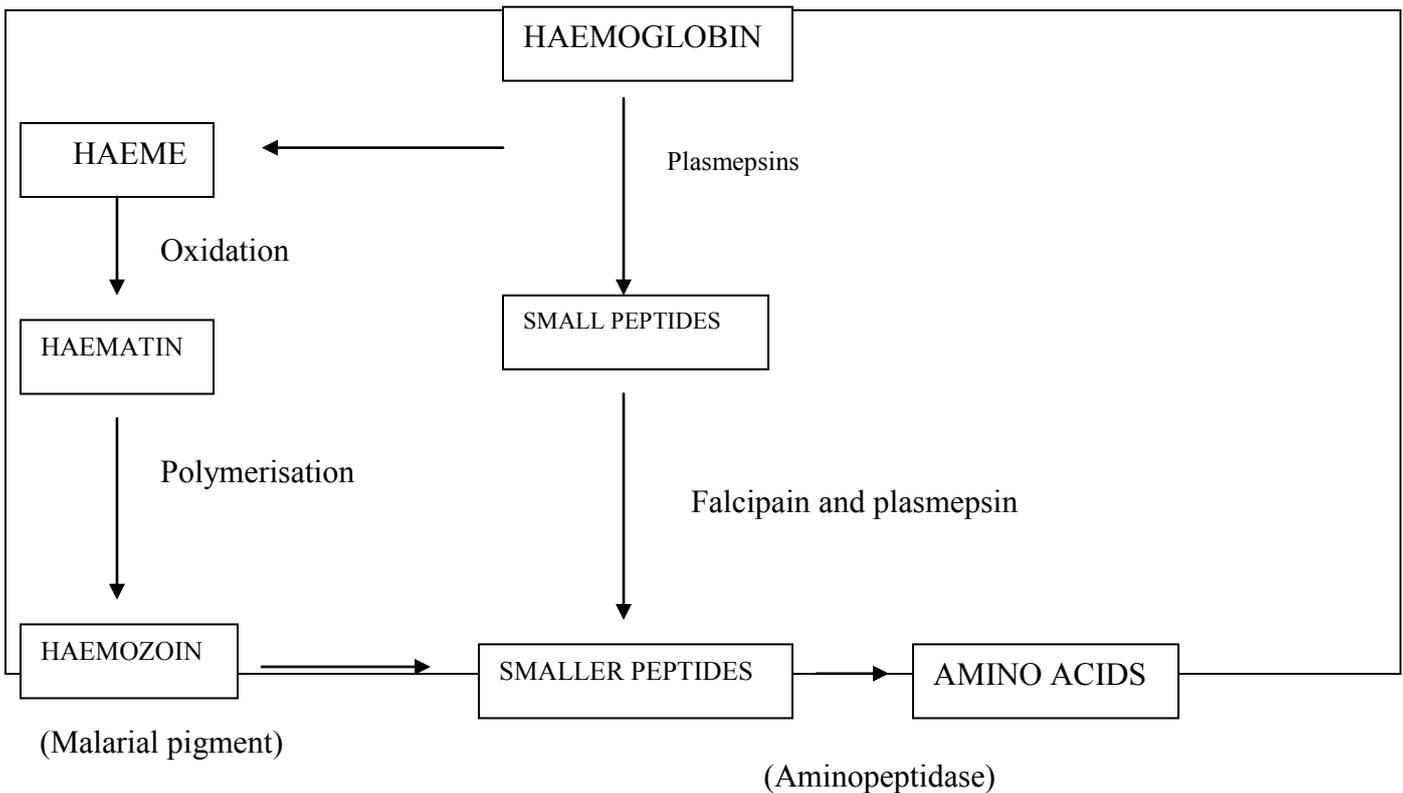


Figure 1: Plasmepsins from *Plasmodium falciparum* Degrades Haemoglobin in RBC. (Adapted from <http://wisdom.eu-egee.fr/malaria/plasmepsins.pdf>)

2.2 RBC (Haemoglobin) Degradation

The ability of the blood protein haemoglobin to carry oxygen depends on an iron-containing haeme group, which is made separately in the cell and then binds tightly to a crevice on the globulin protein surface in red blood cells (RBC or erythrocytes). Haemoglobin is degraded by a series of proteases in the digestive food vacuole. The sequential process is represented in Figure 1.

Plasmeprin I and II attack the haemoglobin breaking it down to haeme and small peptides. The haeme is converted to haematin by oxidation and further polymerises to haemozoin which causes the high fever. Eventually, smaller peptides result and metabolise into amino acid.

Two homologous plasmepsins I and II are responsible for the initial attack on the hemoglobin Alpha chain between the residues Phe 33 and Leu 34, in the hinge region. This region is highly conserved and responsible for the stability of the haemoglobin tetramer. Upon cleavage, haeme (ferrous +2) is released which is toxic to the parasite and is further oxidized to haematin (ferric +3), also toxic to the parasite. Finally, the haematin is polymerized to haemozoin, the malarial pigment. Both plasmepsin I and II are capable of causing an initial cleavage in the hemoglobin, and the plasmepsins are also capable of several other cleavages after the initial attack.

3. What Is Anopheline Malaria Vector Sterile Insect Technique (SIT)?

In integrated control of malaria vectors, the technique introduces genetic sterility in anopheline females of the target population in the field following their mating with released sterile males. Sterility is caused by dominant lethal mutations in the sperm of the released males resulting from radiation. A dominant lethal mutation is one that leads to the death of the developing zygote, in this case the embryo, irrespective of the genetic contribution of the other gamete. A sterile male has therefore to mate and transfer viable sperm and also accessory fluid of the appropriate quality and quantity to ensure appropriate female behaviour (Robinson et al., 2009). This process results in population reduction or elimination via embryo lethality caused by dominant lethal mutations induced in sperm of the released males. Using sterile males to control mosquito vector populations can only be effective as part of an Area Wide – Integrated Pest Management (AW-IPM) programme. The area-wide concept entails the targeting of the total mosquito population within a defined area. The success in area-wide implementation in the field can only be achieved

if close attention is paid to political, socio-economic and environmental sensitivities and an efficient management organization (El Sayed et al., (2009). Several ethical, legal and social issues are associated with the approach Sterile Insect Techniques (SIT) need to be seriously considered and handled with care.

4 Ethical and Social Issues in Sterile Insect Technique (SIT)

4.1 Ethics and Biosafety Aspects of Handling Mosquito Irradiation

Several biosafety aspects of handling mosquitoes and the irradiation process must be considered. To prevent the escape of reared mosquitoes, appropriate quarantine containment and precautions will be put in place, as described in the Arthropod Containment Guidelines, Arthropod Containment Level 2 (The American Committee of Medical Entomology, 2003). The specified gamma radiation dose (70 Gy) currently requires one minute exposure. Included with the samples are dosimetry films to help confirm that the proper radiation dose was received by the mosquitoes. Malaria cases, and the abundance and genotype of released males, will be monitored indirectly by trapping females and assessing their fertility status. Population genetics, GIS/GPS, mass-rearing, and mosquito biology and behaviour. Group training is being carried out during experts' missions for researchers and health personnel of the malaria control programme (El Sayed et al., 2009).

4.2 Social issues surrounding Sterile Insect Technique (SIT)

In SIT, non-target species are not affected because it is species-specific, and this preserves as much as possible the natural ecosystem. The eradication of female anopheline is not expected to affect the food chain significantly against the need of the inhabitants since the death of malaria causing species of mosquitoes is utmost desirable for attainment of good health. In addition, alternative prey exists to replace the role anopheline in the food chain. It was clearly demonstrated that the abundance of a non-target anopheline species in the Lake Apastapeque releases in El Salvador, *Anopheles pseudopunctipennis* was not affected by the application of the SIT against the target species *Anopheles albimanus* (Lofgren et al., 1974).

Community leaders, public health workers and representatives of various organizations working on health-related issues in the area have

identified a great need for training and access to up-to-date information and technical support (Krishnamurthy et al., 1962). El Sayed et al., (2009) reviewed SIT in Sudan and noted that there is need to established how much local people understood about the existing malaria problem, assess their socio-economic background and create awareness for the ongoing anopheline SIT project while sensitizing community members for active participation.

4.3 Current SIT Efforts in Sub-Saharan Africa

In spite of several SIT trials carried out on mosquitoes (Benedict and Robinson, 2003), the malaria vector is being targeted on an area-wide basis using the SIT in sub-Saharan Africa for the first time in Northern Sudan. The Sudan Government has requested support from the International Atomic Energy Agency (IAEA) and the Islamic Development Bank (IDB) for the application of the SIT in Northern State to help eliminate the population of *An. arabiensis* from this region. This region fulfils certain criteria that make it suitable for an Area Wide-Integrated Pest Management (AW-IPM) programme incorporating the release of sterile males (Malcolm et al., 2009).

Equipment needed to implement use of the collection of GIS data has been installed and is functioning well. For example, four automated weather stations have been installed, and two field stations have been established at the site by the Ministry of Science and Technology. In Khartoum, two insectaries have been established where populations of *An. arabiensis* from the field site have been colonized. Laboratory experiments on these colonies have been started. The insectaries also act as a source of mosquitoes for the colonies at the FAO/IAEA Agriculture and Biotechnology Laboratories in Seibersdorf, Austria (El Sayed et al., 2009)

5. General Socio-Behavioural Habits, Perception and Misconceptions Of Malaria

Behavioural changes that impact mosquito breeding, such as the removal of pools kept for watering animals, and bush clearing were methods that community members practiced to reduce the population of mosquito. Failure of these practices often accelerate the population increase of disease causing vectors. In spite of the fact that flood pools are the main mosquito breeding sites, man-made breeding sites represent the majority of sites throughout the year. These are mainly pools created for brick manufacturing near the river banks, and are constructed to retain water indefinitely. Irrigation

practices are also one of the main sources of breeding sites, although most breeding may occur in riverside pools.

Socio-behavioural aspects associated with malaria affect the control and prevention of the disease. Malaria occurrence and transmission are also affected by key behavior and perceptions of the people towards it. Differences in beliefs, perceptions, and attitudes of the rural Filipinos associated with ignorance has been shown to hamper prevention and control measures. Several rural Filipinos attribute the cause of malaria to some naturalistic and personalistic folk concepts. Such folk concept attach naturalistic situations like heat, cold, winds to be the cause of malaria including. On the contrary, personalistic causes include the participation of human, non-human, or supernatural agents in the development of malaria. Some Filipinos were found to believe that drinking contaminated water causes malaria. Some people do not believe that the major cause of malaria are the mosquito bites rather their misconception is that malaria is caused by drinking water contaminated with mosquito eggs.

5.1 Socio-Economic and Political Migratory Risks Factors

Honrado and Fungladda (1994) in his work reviewed studies in Thailand and in the Philippines with migratory risks contributory to malaria incidence. They noted that a sizable proportion of these movements are economically motivated, which could either be legal or illegal, e.g., gem mining in Thailand; gold panning both in Philippines and Thailand; labour migration for sugar cane plantation, hunting and poaching, etc. (Sornmani et al., 1983; Singhanetra-Renard, 1986). However, some are politically driven, e.g., the illegal movement across the Thai-Myanmar or Cambodia borders (Singhanetra-Renard et al., 1986) the movement of security forces into endemic areas in Indonesia and Malaysia (Arasu, 1992; Oemijati, 1992) and the intensive transmigration scheme of the government in Indonesia (Arasu, 1992)

In Africa, much political instability, militancy and war exacerbated failed malaria control strategies. Malaria infection can kill soldiers in war situation if medication is not nearby.

5.2 Certain Customs and Beliefs on DDT House Spraying

Moreover, lack of knowledge or disbelief in the benefits of DDT house spraying, lack of

health education efforts regarding the purpose of spraying operations, misconduct or failure of spraymen to establish a good rapport with the community as well as defects in the management and supervision of spraying operations have all been implicated as reasons for a relatively poor community compliance. The negative aesthetic effects (e.g. causing the walls to become dirty or the roof to rust) and certain customs and beliefs of some communities, particularly in Malaysia have also been pointed out to be reasons for refusal (Honrado and Fungladda (1994); Hongvivatana et al., 1982)

5.3 Behavioural Apathy to the Importance of Bed Nets

The Roll Back Malaria (RBM) campaign in all malaria endemic communities in the world has greatly exploited enlightenment programmes towards the importance of mosquito net categorized into Insecticide Treated Net (ITN) and Long Lasting Insecticidal Net (LLIN). AED Netmark, a US company engaged in private-public partnership for sustainable malaria prevention is responsible for liaising with various governments agency especially in provision of affordable and free mosquito net in Sub-Saharan Africa. NetMark has a representation in Nigeria, Ghana, Senegal, Mali, Ethiopia, Uganda, Zambia (<http://www.netmarkafrica.org/Countries/>).

Among the proposed users of the bed nets, our observation with the immediate community and various countries at large shows that net owners do not use them owing to some behavioural attitudes. Reasons adduced is that they are unable to sleep under the net because they grew up without living within mosquito nets since they were born and nothing has killed them. Others adduced night sweating arising from the reduced aeration occasioned by the bed net as their reason for non-use of the mosquito net. In Kenya and most African countries, most people sleep under a net throughout the year, while a few only used a net when mosquitoes are abundant. The actual usage of various methods might be decided by the household head and depend on the socio-economic status of the household (Opiyo et al., 2007).

5.4 Behavioural Attitudes Predisposed to Drug Resistance

In many communities in developing nations, health care centres are never approached until the complication stage of infection arises. This is usually the case after several failed attempts of self-medication with no sign of improvement. This is compounded by taking subtherapeutic

doses or failure to take prescribed full course of therapy especially when there are signs of recovery at the onset of the early dosages. Most drugs sold over-the-counter as treatment for malaria in the village markets contained only one or two tablets of antimalarial drugs such as, chloroquine, quinine, primaquine, mefloquine and sulfadoxine/pyrimethamine. Some countries are not yet fully ready to forget Chloroquine as first line treatment for malaria due to expensive nature of Artemisinin Combination Therapy (ACT) which cost as high as about 1000 naira in Nigeria.

Has nonregulated use of antimalaria drugs on the Thai-Cambodian border promoted the recent loss of mefloquine sensitivity to *Plasmodium falciparum* parasites? Plasai and Spielman (1996) attempted to investigate the problem and noted that local nonregulated healers prescribed orally administered concoctions containing chloroquine, quinine, tetracycline or primaquine for gem miners suffering mild illness. Because gem miners appear not to have had informed access to mefloquine before 1990, Plasai and Spielman (1996) concluded that the loss of antimalaria efficacy of this drug on the Thai-Cambodian border during the late 1980s was independent of its nonregulated use. However, it is pertinent to note that WHO (2009) reported that artemisinin monotherapy in South East Asia has been responsible for resistance and advocated for its removal from the market and the highlighted the need to use Artemisinin Combination Therapy (ACT).

6. Conclusion

Most urban and rural communities in developing nations of the world have been neglected over the years by their political leaders for unfulfilled promises. The case of Nigeria, the efforts have been bedeviled by corruption, political and leadership problems and lack of faith in the proposal of government. Government approach with tangible implementation of unfulfilled promises, like provision of uninterrupted power and water supply, improvement in health care and presentation of gifts in form of free medical check-up and free drugs to citizenry will change the heart of the people and help in convincing them to accept malaria programs as their own and not another government gimmick. This will go a long way to help win rural communities cooperation to imbibe new malaria strategies like SIT, and other ways to eradicate the disease.

Among the population identified to be at greatest risk, since behavioural risk seems to be

more difficult to change at shortest possible time, evolution of new malaria control schemes and strategies need to be tailored to accommodate effective control method necessary for modification of most behavioural risk. Aggressive and efficient health education control programme is also inevitable in this regard.

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and ASSOCIATE MEMBERSHIP IN EUBIOS ETHICS INSTITUTE 2010

I wish to pay my annual membership fees of Asian Bioethics Association (ABA), and receive the 2010 issues of *Eubios Journal of Asian and International Bioethics (EJAIB)* (The Official Journal).

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I wish to register as a member of Asian Bioethics Association, but am not in the position to pay a fee. I understand that I should be satisfied with Internet access to *Eubios Journal of Asian and International Bioethics (EJAIB)* <<http://eubios.info/EJAIB.htm>>.

I wish to apply to become an associate member of Eubios Ethics Institute for the year 2009. This includes the 2010 issues of *EJAIB*, and a 10% discount on book and CD sales at this time. It is no additional charge for members of Asian Bioethics Association. For other persons the price is:

Regular Price: US\$40 Euro 35 UK£20 NZ\$50 A\$50 C\$50 ¥4000 Overseas price NZ\$70

Exchange subscription with journal, newsletter, etc. (Name _____)

I agree / do not agree to my name being listed on the Eubios www site for the: ABA and/or Genetics and Bioethics Network (circle one or both) (send also tel/fax/Email):

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The Eleventh Asian Bioethics Conference (ABC11)

Singapore, 31 July -2 August 2010

Mundalization, Bioethics and Policy

Organised by the Asian Bioethics Association, the Centre for Biomedical Ethics of the National University of Singapore (NUS), and UNESCO.

This is also the Fifth UNESCO Asia-Pacific School of Ethics Roundtable

Explanation

The 31st July sessions of ABC11 will be held in conjunction with the 10th World Congress of Bioethics (WCB), and abstracts for presentation on that day should also be submitted to the WCB secretariat [abstracts@bioethics-singapore.org], with a copy to the ABC11 secretariat. Submitted abstracts if accepted will be in concurrent sessions. Registration fee either included with WCB registration, or SGD150 for one day for IAB member.

The plenary sessions of ABC11 will be on 1st and 2nd August at the Clinical Research Centre Auditorium, Block MD 11, Level 1, starting at 8:30am on the 1st. Registration fee for these two days is USD70 for ABA members (100USD for non-members). Payable at time of registration in USD, Singapore dollars equivalent, or by Visa/Mastercard.

Submissions & inquiries to ABC11 secretariat, Email: rushsap@unescoibkk.org

Call for papers: Research findings, discussion papers, and other contributions dealing with the above theme are welcomed. Papers are invited on, but not limited to, the following sessions:

- **Brain Research and Neuroethics in Asia** (Date 1 August)
- **Globalization and Mundalization in Asian Bioethics**
- **Trials of UNESCO Core Curriculum in Bioethics Education** (Date 2 August)
- **Ethics and Climate Change** (Date 2 August)
- **Ethical issues in Practice of and research in Traditional and Complementary Asian Medicine**
- **Migration of Health Care Professionals**
- **Emerging issues in Asian Bioethics**
- **Cultural diversity and Globalization**
- **Disaster Ethics**

The preliminary program will be available on www.eubios.info/ABA.htm shortly. Please renew ABA memberships to take advantage of the ABA membership discounted rate.

The conference will also make judgments for the best student presentations.

The updated information will be placed on the website: www.eubios.info/ABA.htm

Other links: For WCB Call for Abstracts: <http://www.bioethics-singapore.org/wcb2010/Abstracts/>

For WCB Travel Grant Applications: <http://www.bioethics-singapore.org/wcb2010/TravelGrants/>

For IAB Membership: <http://bioethics-international.org/iab-2.0/index.php?show=memdetails>

For ABA Membership: www.eubios.info/ABA.htm