

“A New Paradigm on the Mind-Brain Problem: A Dualistic Model and Suggestions from Unification Thought”

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I. Introduction: On the Relationship between Religion and Science, and on the World Model

In the Eastern world, the relationship between religion, philosophy, and science has been relatively harmonious and coexistent. In contrast, there has been confrontation between them in the Western world. In European countries where there was absolute authority of Christianity until the Middle Age, religious thoughts had apparently superior position than scientific thoughts in the societies. Words of the Holy Bible were thought to be more important than scientific data, and the thoughts that deviated from the Bible were under taboo. In those days, the existence of God and spiritual beings were undeniable facts, and mentalism that claimed that all material beings were merely the results of the spirit was predominant in the philosophical world.

At the time of the Renaissance, however, repulsion against arbitrary and dogmatic thoughts had occurred. And confrontation began between the scientific approaches that pursued the truth by accumulation of facts and experiments inductively and the religious approaches that claimed the truth based upon dogmas deductively. The religious trial against Galileo Galilei who insisted on the heliocentric system was the historical event that showed the confrontation between science and religion. At the trial, Galileo's opinion based upon the astronomical observation was denied by the geocentric system based upon the Bible words.

After the era of confrontations and conflicts, the situation became totally different. Science-center-ism, fact-center-ism, and material-center-ism overwhelmed the world. Only the theories based upon data and experiments came to be considered as reliable and certain. There came the world of science and matter. Gradually, the division of labor occurred so that science handles matter and religion handles spirit. In our science-centered and material-centered world, religions or spiritual beings have only slight ground for existence.

When we think about true human happiness, we need not only physical joy and satisfaction but also spiritual happiness. For the sake of prosperity and development of humankind, we need both religion and science. It is the most important theme for us to find out how religion and science can coexist in harmony. The Mind-Brain problem has direct connection with the harmony.

The Mind-Brain problem has become a very important and difficult subject in two scientific fields of the 21st century. One is brain science and the other is quantum physics. In brain science, the more the function of the brain is studied, the greater the mystery of the mind becomes. In quantum physics, “the measurement problem” leads quantum physicians to

think about the relationship between mind and material as logical consequence. The “measurement problem” is the inconsistency of the quantum theory when interpreting the standpoint of subjects and objects by observation of elementary particles.

Nowadays, we have entered the era of great paradigm shift since the Renaissance. We might call it the “New Renaissance” era. The Mind-Brain problem has a serious controversy like the confrontation between heliocentric theory and geocentric theory. At the time of turning point, we must give up the old ideas and stereotypes with modest attitude and pure eyes like child to be on the side of the truth.

When we think and study about the Mind-Brain problem, a key question is what paradigm we should use. It is my belief that in Unification Thought there are very important suggestions for such a paradigm. In this paper, I will first review the theories of the Mind-Brain problem by modern scientists. Second, I will describe the standpoint of Unification Thought. Third, I will explain the limits of monistic materialism and present some possible models of dualism, and, finally, I will offer suggestions from Unification Thought which I believe will be helpful for the further studies in the future.

II. Theories of the Mind-Brain Problem

During the past these 20 or 30 years, brain science has developed rapidly. Currently, at microscopic levels, neurons that compose the brain, connections of the neurons, which are called synapse, and chemical transmitter, which transfers signals at the synapse, are being studied in terms of their structure and function. They are also being analyzed in terms of the aspects related to genes. Neuron network systems, which consist of 14 billion neurons, are studied as super-complex system.

At macroscopic levels, the studies of local brain function are rapidly progressing recently. As for the study of local brain function, it started from the analysis of patients who had brain damage because of injury or cerebrovascular disease. It is well known that Penfield stimulated various parts of the brain electrically during operation and studied the experience of the patients at those stimuli. By using functional magnetic resonance imaging (which is called functional MRI), positron emission tomography (which is called PET), and magnetic encephalogram (which is called MEG), we can easily know which part of the brain are activated metabolically or cerebral blood flow increased at certain task. From these techniques, complex and detailed brain local functions or networks have been made clear these days.

Apart from the products of modern science, there are four views to explain the relationship between the mind and the brain, philosophically.

- ① Mentalism, which says that what really exists is God or the cosmic spirit, that the human mind is a part of it, and that material beings are merely secondary.
- ② Materialism, which says that what really exists is material brain only and that the mind is a product or a function of the brain.
- ③ Dualism, which says that the mind and the brain are different beings and that they can be separated.

- ④ Monism, which says that the mind and the brain are one and cannot be separated.

Among those views, materialism is supported by most modern scientists. But, it is also true that some of the scientists have other views. Next, I would like to introduce the theories of scientists and philosophers.

(1) Descartes

Descartes

It can be said that R. Descartes (1596-1650) was the one who originally started the Mind-Brain problem in modern science. In order to explore the mind, Descartes tried to use a scientific method as he did to explore matter. In other words, he dealt with the existence of the mind as an obviously observable fact, not as an issue of revealed doctrine. He said that spirit is a substance which has no material element and whose essence is thought. He also said that matter is a substance, which has no spiritual element and whose essence is extension only. In other words, his position was that of dualism, which separates the mind and the body by saying that the mind is the mind and that the brain is the brain. He thought that the pineal gland inside the brain was the point of contact between the mind and the body.

(2) Ivan Pavlov

Pavlov an

Ivan Pavlov (1849-1936) of Russia took interest only in the external manifestation of the brain function excluding the internal mental function. He conducted a research of digestion in dogs and discovered conditioned reflexes. Using materialistic terms, he speculated the process of excitement and restraint taking place inside the brain of a dog. As a result, he concluded that all behaviors are the mixture of conditioned reflexes, thus expelling consciousness. He thought that science should be based on objective measurable matter and materialistic world-view. It is psychology of behaviorism that followed the tradition of Pavlov.

(3) Reductionists

Gerald M. Edelman, a representative neuroscientist of reductionist materialism in modern age, explains the mind in a materialist way by reducing the mind to the brain. He insists that the mind is derived from interaction of the neurons. Furthermore, he stands in the position of Darwinism as indicated by his remark such as "The patterns of nervous system response depend on the individual history of each system, because it is only through interactions with the world that appropriate response patterns are selected." And, he strongly denied the existence of any mental being transcending the brain by saying, "We have no programmer, no homunculus in the head." Homunculus is the idea that in the brain there are dwarfs who deal with information. Materialists talk about this idea in order to deny the existence of mental beings by saying that, if homunculus is hypothesized, it leads to the necessity of the existence of homunculus which deals with information which homunculus has received.

Francis Crick, who, together with James Watson, discovered the molecular structure of DNA, also made his reductionist materialist position clear by saying, "In the past the mind was regarded as something separate from the brain but interacting with it in some way. But most neuroscientists now believe that all aspects of the mind, including its most puzzling attribute, consciousness or awareness, are likely to be explainable in a more materialistic way as the behavior of large sects of interacting neurons."

(4) Monism by Sperry

Roger Sperry was opposed to both materialism and reductionism. According to Sperry, consciousness is something that transcends the totality of physical phenomena of the brain and affects the function of the brain. However, he denied the possibility that consciousness exists apart from the process of the brain. In other words, he did not recognize the existence of souls. He said as follows:

“In calling myself a mentalist, I hold subjective mental phenomena to be primary, casually potent realities as they are experienced subjectively, different from, more than, and not reducible to their physiochemical elements. At the same time, I define this position and the brain-mind theory on which it is based as monistic and see it as a major deterrent to dualism.”

Sperry is in an ambiguous midway position. On one hand his position has been used to support the arguments of dualism; on the other hand his position has been used to support the materialist philosophy that the mind and the brain are identical. Sperry's position is called “Monism by a mentalist.”

(5) Penfield

Wilder Penfield (1891-1976), who was a world authority of brain surgery, had a strong monistic belief when he was young that the study of the brain would clarify all the mysteries of the world of human spirit. He painted on a garden stone in his home an illustration of the brain with a chart saying, “*Nous* is the brain.” *Nous* means the mind or the spirit.

However, no matter how hard he studied, he could not find in the brain the answer to the question of self-consciousness. As a result, in his later days, he came to stand in the position of dualism, discarding the position of monism, and came to think that the brain was not the pivot of consciousness. And, he allegedly added a big question mark above the equation mark between *nous* and the brain.

In his book “The Mystery of the Mind,” he said, “The brain is a computer; the mind is a programmer.” Just as a computer becomes useful when it is given a program and maneuvered by somebody outside itself, “it is the mind that gives instruction of all the programs for the brain.” According to Penfield, the mind and the brain are connected but separate beings. He thought that in searching for the question of “what is the mind?” one could not help accepting the existence of the mental energy and the existence of souls.

(6) Eccles

John C. Eccles (1903-97), who received the Nobel Prize for medicine in 1963, insisted that the mind and the brain are different beings, and advocated the position of dualism. He said,

“We are a combination of two things or entities: our brains on the one hand; and our conscious selves on the other. The self is central to the totality of our conscious experiences as persons through our whole waking life.”

At the end of his life long fight against materialism, he challenged materialism in his

last book, "How the Self Controls Its Brain." He wrote,

"A most important programme for this book is to challenge and negate materialism and to reinstate the spiritual self as the controller of the brain."

Eccles did research on how the mind and the brain interact, and insisted that "mental phenomena occur to act in the quantum probability field to alter the probability of emission of vesicles from presynaptic vesicular grids." Presynapse refers to the ending part of neuro fibers, which make up synapses.

(7) Penrose

Roger Penrose, a mathematical physicist, tries to explain the human mind by using the knowledge of the quantum theory and cosmology. He says, "The unity of a single mind can arise in this description only if there is some form of quantum coherence extending across an appreciable part of the entire brain." In other words, he explains how the spirit comes from the matter by means of the quantum theory. And he maintains that microtubules within neurons are where consciousness is produced. "Microtubules seem to be a good candidate for the structures within which this large-scale quantum coherent activity might take place."

Microtubules are small tubes made up with protein. According to him, electrons and photons can run inside the tubes. If there is the field of photons inside these microtubules, there is the possibility for non-local quantum effects to occur. This quantum effect produces the human consciousness. Penrose thinks that the human mind can be explained only by some law of physics which has not been discovered yet but which can unite the quantum dynamics and the theory of relativity.

Not only Penrose, but also several quantum physicists refer about the relationship between material and consciousness, like David Bohm, Henry Margenau, Henry Stapp, and Friedrich Beck.

(8) Umezawa / Yasue / Jibu

A Japanese scientist, Umezawa, interpreted the quantum physics that fitted only for microcosmic world to fit for macrocosmic world using quantum theory of the field. And with that theory, he explained the brain function and made up the theory called "Quantum Brain Dynamics". Yasue and Jibu developed the Umezawa's theory. They think that the interaction between electric dipolar field of water and microtubules produce memories and human consciousness. Due to the interaction, microtubules emit the ultra short pulse light, that is super radiant light, and such quantum optical network is the basis of the mind.

(9) Bohm

David Bohm, a British theoretical physicist, explored into the world of consciousness although he was a physicist, and developed a unique view of the universe, which was called holographic theory. He thought that the visible universe is the emergence of the implicated order. And he also said that if we pursue matter more and more deeper, we might eventually reach the stream where mind and matter fuse. Furthermore, Bohm says of the ultimate actuality which is neither mind nor body but rather a being of a higher dimension, and which is their common ground and which is of a nature beyond. His model is called "Holographic Universe Model."

(10) Modern science and mentalism

There exist a few but some modern scientists who advocate mentalism. A Japanese theoretical physicist, Teruaki Nakagomi, advocates “mentalist physics” or “quantum monadology” to solve the measurement problem of quantum physics. He has made up a physical model mathematically on the ground of Leibniz's monad theory, which claims the world is composed of plural monads that reflect the universe. And by that theory, he unites quantum dynamics and the theory of relativity.

Abner Shimony, an honorary professor at Boston University and quantum physicist, insists that it is difficult to explain the human spiritual life by the materialistic worldview, and he proposes to interpret the mentalistic philosophy of Whitehead in a modernistic way.

III. Viewpoint of Unification Thought about the Mind-Brain Problem

Viewpoint of Unification Thought is called “Oneness with dual characteristics.” It claims oneness as for the causal world and dualism as for the resultant world. The Primal Cause, God, has dual characters, which consist of mind and matter, but His two characters are completely harmonized and united. In contrast, in our resultant world mind and matter are two different beings and exist separately. But both mind and matter are originally emerged from common dualistic cause, so mind has character like energy and energy has character like mind. We already know, through the Einstein's theory, that matter is equal to energy. That is the reason why mind can control its body or why energy is only expressed by multiples of Plank's constant.

The relationship between inner world and outer world is correspondence but not cause and effect, because they are the two aspects existing even at the primal cause. So they are irreducible each other.

This viewpoint is totally similar to David Bohm's “Holographic Universe Model”, and as for the Mind-Brain problem it is dualism such as Eccles or Penfield's opinion. In other words, Unification Thought is consistent with modern science and provides systematic visions to modern science.

IV. Limits of Materialistic Monism on the Mind-Brain Problem

Consciously or subconsciously, materialistic monism was the background worldview of modern science. In fact, in those fields which science dealt with, most cases were explained by the materialistic theories and they have brought great prosperity to our societies. But materialistic paradigms are challenged through the Mind-Brain problem seriously and revealing its limits. There are such controversial points as follows:

(1) Binding problem and problem of consciousness

For example, let us consider how visual information is processed in our brain. Visual information is processed through the 1st visual field (V1) to the 5th visual field (V5). Forms are recognized at V1, colors V4, motions V5. Each specific quality of the object is

processed at different parts of the visual field. After these processes, information is projected to temporal association area and parietal association area where object recognition and space orientation are processed respectively. This information processed at different parts of the brain must be integrated finally for the sake of one consistent image of the object. The question about integration of information in brain is called “binding problem.”

Descartes thought that mind exists at pineal body of brain, and it meant the locality of consciousness. This idea is called the “Descartes’ theater model.” This model claims that all the information related to the formation of consciousness gathers at one place within the brain, namely, the theater. On the other hand, there is non-localization theory which emphasizes that consciousness is expressed in a scattered way in the brain. Until now, the center where all the information related with consciousness gathers has not been found. Then, how are the information integrated in our brain? Singer and Crick think that synchronization of neuronal activation will play a part in integration of information.

I think, however, that this theory is unreasonable. Because the activated regions in the brain change each moment totally, so the synchronization of such neuronal activation would be like tightrope walking all the time and the consciousness brought by this synchronization would not have unity, clearness or durability as we always experience. The binding problem tells us the non-locality of consciousness.

(2) Qualia

Our living sensual world is consisted of various sense of quality like quality sense of red color; cool feelings of water, or sweet taste of sugar. These unique qualities of sense are called “Qualia.” Recent years, the issue of qualia has become one of the most difficult problems related with the Mind-Brain problem. Because qualia like a red color sense quality has clearness and uniqueness, which we can’t describe by number, amount, or symbols we used traditionally to describe the laws of material beings. Of course qualia are the phenomena correspondent with the action potentials of neuronal membranes, but it is far from sufficient to explain everything.

Famous neurologist Ramachandran mentions about the mystery of qualia in his writings. “How can the flux of ions and electrical currents in little specks of jelly... the neurons in my brain...generate the whole subjective world of sensations like red, warmth, cold or pain? By what magic is matter transmuted into the invisible textiles of feelings and sensations?”

To say the conundrum in a word, what is the mechanism of transforming outer material phenomena into expressions of the inner multifarious world? There are only slight correspondent relationship but not the relation of cause and effect.

To begin with, simple question about materialism is that it is against what we feel in our daily lives. We always recognize matter as visible things of the outer world and it is easy to joint the recognition with others. Matter is static, passive and having no voluntary act to others. On the contrary, mind is invisible and we always feel it inside. We can’t joint the feeling inside directly and we can only guess each other’s inner world indirectly comparing with feeling of ones own. Mind has dynamic, active and voluntary character. In other words, matter and mind are totally different existence of different dimension.

(3) Intentionality/Activeness/Creativity/Free will

Intentionality is a fundamental character of our mind. It means that the mind is always giving attention to something. Mind gives attention sometimes to the concrete object of outer world and sometimes to the inner ideas or thought self-examinately. Intentionality was originally used by scholastics in the Middle Age. Brentano, Austrian philosopher and psychologist in the 19th century, mentioned that intentionality is a special feature that distinguishes human spirit from matter, and it can't be reductioned to any material process. In a sense, how intentionality comes out from the neuronal activities of brain is a harder problem than qualia.

Activeness which distinguishes mind from matter, creativity which is the ability of solving problems by combining things totally in a new way, and free will which is the basis of human dignity...they are also big unknown mysteries of neuroscience.

(4) Viewpoint of evolutionary theory

The monistic materialism claims that mind is only an accompanying phenomenon of material process of the brain, and it doesn't play any active role in the process. Speaking extremely, it means that it doesn't change anything if mind exists or not. American philosopher, David Chalmers assumes the existence of zombie which looks completely like human on the surface and talks like human and acts like human but doesn't have internal mind which feels the outer world. From the standpoint of monism, human beings are same as zombies. On the other hand, from the standpoint of dualism, mind plays an active role. So it does change if mind exists or not. Materialism can't explain why the mind has come into existence and has developed through the process of evolution. If existence of mind doesn't play an important role and it doesn't change human lives, it should have disappeared in the process of natural selection.

V. Dualism that Is Consistent with Scientific Facts and Some Suggestions from Unification Thought

It is true that in the field of modern brain science there are few scientists who support the theory of dualism. But it does not mean that the dualism is not true. Because there are serious problems for monistic materialism to solve, and no lucid explanation. On the other hand, from the standpoint of dualism these problems could be solved as follows and could give reasonable explanations.

First, about the binding problem or the problem of consciousness. It could be explained that the consciousness center which integrates the various information from various cognitive functions exists as spirit that is independent from matter. So, no matter how hard we may look around, we cannot find such a center in the brain.

Second, the problem of qualia. We could solve this problem by adopting the idea of Unification Thought, which indicates the human being is a microcosmos and an encapsulation of all things. There are images or ideas of all things within human mind a priori, which called the "prototypes," and prototypes include qualias of all things. This idea has similarity to a hologram. In hologram, a part of hologram includes whole information of the hologram.

Third, the problems of intentionality/activeness/creativity/free will. These problems are explained naturally by dualism. Mind controls its brain like a master. It is not that the interaction of neurons creates mind, but the activation of mind results in the interactions of neurons and gives influences on his body. This is the reason why activeness of mind are independent from the brain, and the direction in which mind directs its attention is the direction of intentionality. There is also the same mechanism of creativity or free will. They are results of the mind function which can act under it's own rules.

Fourth, the viewpoint of evolutionary theory. Because the mind played an active and important role in the process of evolution, it survived and developed in spite of the process of natural selection.

If we stand by the side of dualism, we must discuss how it would be consistent with scientific facts and make up the possible models. As I mentioned already in the review of the theories, there is an idea that indicates that the interactions between mind and brain are made by means of mechanism of quantum physics. It is because in the world of quantum physics there are non-determinativeness and non-local interactions that the laws of classical physics do not recognize. It has the similarity to the features of the world of mind.

Furthermore, Eccles mentioned that such quantum mechanism functions through giving influence on probability of the emission of neural transmitters from presynaptic vesicles.

Penrose has suggested that there might be quantum interactions like superconductivity in the microtubules.

Quantum brain dynamics by Umezawa, Jibu, and Yasue, using quantum theory of the field, pays attention to the interaction between the electric dipolar field of inner and outer celler water and microtubules. Inside of neurons, there are optical and quantum networks of microtubules, and outside of neurons, there are interferent waves of collective movement of electric dipolar fields of inter-cellular water. And these are the physical entities of mind, they insist. Furthermore, microtubules exist not only in neurons but also in other cells of the whole body. So, the mind exists not only in the brain but also in the whole body. But, brain quantum reactions occur more easily in the brain than in other parts of the body because they are shutted off by cranial bones from outer electromagnetic fields. And functions of mind are stronger in the brain.

Although Penrose or Umezawa use quantum theory to explain, their ideas are on the basis of materialistic worldview. I would like to emphasize that, even if someone made up physical models by using quantum theories, he could not answer the question of how outer material world transforms into inner spiritual world, or how matter could have activeness or creativity like mind. So, I think that quantum mechanisms are only an interface of mind and brain interactions.

Finally, I would like to mention about the suggestions from Unification Thought for future studies of Mind-Brain problem. The first point is that inner world and outer world have only correspondent relationship and they could not be reduced to one of them. And, the second point is that mind has an aspect of energy and that energy has an aspect of mind. I

think these are very important viewpoints that lead us to productive researches.

Thank you very much for your attention.