Electro-magnetic Process of Consciousness: A Buddhist Perspective

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Abstract

The process of mind, brain and consciousness is a subject matter discussed not only in the field of Buddhist Studies but also in Science and Psychology. In Buddhism, especially in *Viddhimagga* of Buddhaghosācariya states that *citta*, *mano* and *viññāṇa* are similar in meaning but indifferent with their characteristics. In science and psychology, Livergood and Norman illustrate the consciousness as that which runs throughout body including brain. Further, they explain the characteristics of brain as almost similar with the mind. The reason is that each neuron produces and transmits electrical impulses. When the characteristics of electrical impulses are concerned with reference to Buddhist teachings, it can be identified as *viññāṇa*. The brain, a like radio receiver, as Rupert Sheldrake suggests, proves that it is the mind which is in accordance with Buddhist teachings is also identified with mind, *mano*. *Citta,* which is not yet discovered by the Scientists but Psychologists, is one of the subject matters that should be further, clarified what they have identified it as consciousness. Even among the Buddhist scholars there is not unanimously accepted difference between *citta, mana* and viññāṇa. Therefore, in relation to the Theravada Buddhist sources, the characteristics of *viññāṇa* as an electro-magnetic process are to be examined with the aim of clarifying how it differs from *mano* and *citta*.

Key Words: *Citta*, Mind, Brain, Consciousness, *Viññāṇa*

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Introduction

In accordance with early Buddhist teachings, the fifth aggregate of the being is *viññāṇakkhandha* (in Pāli) / *vijñānanaskandha* (in Sanskrit). The word given in English to identify this is consciousness. In Buddhism, there are two terms; *citta* and *viññāṇa* that are identified with the same term 'consciousness'. The result is that, since, consciousness has not been further clarified in psychology as it is in Buddhism, its understanding on it appear to be limited in contrast to the latter. Therefore, the the terms; *citta*, *viññāṇa* in Buddhism have to be defined with two different terms in English; mentality (*citta*), consciousness (*viññāṇa*). However, considering the difficulty of finding *citta*, *mano* and *viññāṇa* separately in a naked mind, Ven. Buddhaghosa thero defines them as they are similar in meaning (*viññāṇaṃ cittaṃ manoti atthato ekaṃ*).[1] As a result of that, disagreements have arisen even among the Buddhist scholars. Even though in psychology, consciousness is identified in association with the brain, it cannot be identified purely as *viññāṇa* given in Buddhism. Therefore, in this research, in relation to the literary sources, *viññāṇa* has been identified as an electro-magnetic process running with the blood not only throughout the body but also the brain with the help of heart.

Research Problem

On the one hand, since the controversy on *citta*, *mano* and *viññāṇa* whether they are identical has been among the Buddhist scholars and psychologists, the diversities of the three: *citta*, *mana* and *viññāṇa* were under discussions. On the other hand, the disagreement prevailed among the psychologists and scientists were

also caused not to have formal investigations. With the development of electro-biology, the technologically has been developing with introducing equipment; Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI) that is being used to examine any part of the body. MRI scans can be used to examine almost any part of the body, including: brain and spinal cord, bones and joints, breasts, heart and blood vessels, and internal organs such as the liver, womb etc. Unlike MRI scanning, PET scans show problems at the cellular level. Therefore, it can be used more effectively to detect cancer, heart problems, brain disorders, problems with the central nervous system.

Research Methodology

Depending on the Buddhist literary sources, the diversities among *citta*, *mano* and *viññāṇa* are to be investigated and the data especially the research work done by the scientists, psychologists and biologists are to be applied to prove them.

Discussion

Most of the time, in science, brain is identified as the seat of consciousness. Philosopher Colin McGinn introduces;

> … a property P of the brain in Virtue of which the brain is the basis of Consciousness and a theory T, referring to P, which fully explains the dependence of conscious states on brain states. He adds that if we knew T, then we have a constructive solution to the Mind-Body problem.[2]

Because Colin has paid his attention on P and T which cannot be identified separately from consciousness, we can guess that he has touched the Buddhist idea on *Citta* and Mind. This would be proven with what Colin further explains in relation to the birth and death of an individual showing the characteristics of consciousness which are similar to Buddhist clarification of *viññāṇa*.

> … after consciousness returned to the body and re-established links with the brain. According to our observations the disembodied consciousness possesses visual, auditory and olfactory senses…[3]

The electro-biological equipment; PET and MRI also provide data to prove the Buddhist idea up to some extent.

> … process of receiving data from a stimulus by a sensory organ, transmitting them to the brain, computing and processing the data and passing the processed data to Consciousness, can be reversed by hypnotizing a person.[4]

As the techniques of PET and MRI reveals, the process of receiving data is very much akin to the teachings found in Madhupiṇḍika Sutta. It explains that the perceptual knowledge begins from the eye and object with the arousal of the eye-consciousness and ends with the mental proliferation (*papañceti*).[5]

As a result of identifying that the consciousness has characteristic differences, a Neurobiologist Sir John Eccles views that the scope of consciousness may not remain limited within the confines of the human skull. But, against this view, Dharmawardena suggests;

> Consciousness is therefore a non-material entity capable of independent existence and not a property. Consciousness is not emergent. It can remain localized in the human brain and interact with the brain through the property P of the brain and thereby control the activities of the human body. Whenever the property P collapses consciousness can leave the brain and go into an independent floating existence.[6]

The clarification made by Dharmawardena evidences his familiarity with the explanations given in Buddhism on *viññāṇa*. What quite against with the Buddhist view is that the independent existence of the consciousness. The behavior of the consciousness is however explained by Dharamawardena with the help of an electron of an atom.

> Electron which is a quantum entity can remain localized inside an atom by quantum mechanical interaction with the electromagnetic field around the atomic nucleus, which itself is quantum in nature, so long as the energy of the atom's quantum state it occupies matches the energy possessed by the electron. Whenever the energy of the electron does not match, it has to shift to another matching state or

> leave the atom and start floating as a free electron. In this case the property that localizes the electron inside the atom, the nature of the electron and the relevant atomic model are well known. All these are quantum in nature.[7]

When the clarification made by Dharmawardena is carefully considered, it is evident that he has identified the consciousness as two; *smurti* and *vijñāna*.

> The *'Vijñāna'* meaning of Consciousness refers to the non-material entity which is capable of independent existence and interacts with the brain through the property P. … The *'Smruti'* meaning of Consciousness refers to a state created by the interaction of the above entity with properly functioning brain and sense organs. It is what a person loses when he/she is anesthetized or receives a hard blow on the head.[8]

With no objection, the term *'vijñāna'* in Sanskrit can interchangeably be used with *viññāṇa* in Pali because the characteristics of *vijñāna,* as it is identified by Dharamawardhena are similar to the Buddhist notion of *viññāṇa*. If this *vijñāna* would be identified as the Consciousness which is operating throughout the body and brain (mind), there is no boundary between Buddhist teachings on *viññāṇa* and scientific teachings on Consciousness.

The data coming from the senses go to the brain with the help of *viññāṇa*. When the data are received by the brain via hippocampus, the perception begins. The process is explained in Madhupiṇḍika Sutta, as *tiṇṇāṃ saṅgati phasso*.[9] Receiving the data in the brain, it simultaneously begins to process *vedanāti, sañjānāti, vitakketi, papañceti*.[10]

The brain is the primary center for the regulation and control of bodily activities receiving and interpreting sensory impulses transmitting information and instructions to the muscles and bodily organs (Skorusa). Even though, such a long process is not mentioned in science up to date, the process of the brain is given with the help of electro-biological equipment. Kari Deisseroth revealing how the neurons process with the data says that the transfer of information between neurons becomes optimal when their activity is synchronized.[11]

According to the theory of causality, the *saṅkhāra* produces *viññāṇa*. The *saṅkhārās* are volitional activities generally known as *karma*.[12] Here, *saṅkhāra*-s can be identified as the neurons. Because these neurons produce electrical impulses, they can be identified as *viññāṇa*. Then there is no objection with Buddhist teachings on *'saṅkhāra paccayā viññāṇaṃ*'.

> The brain is an electrically powered and electricity-generating organ. Composed of an estimated one hundred billion neurons, each neuron produces and transmits electrical impulses which travel from the cell body down long fibers called axons until they reach a junction, or synapse, with another neuron. At the junction point the electrical impulses fire chemical messengers, called neurotransmitters, across the synaptic gap to receptors on the next cell. Having received the message, that neuron then generates its own electrical impulse and sends it to other neurons to which it is connected. Each neuron can be connected to thousands of other neurons, each simultaneously sending and receiving impulses to and from thousands of other neurons … so one neuron can electrically alter millions of other neurons.[13]

Livergood has examined how the consciousness operates in the brain. This is the consciousness which can be identified as the *viññāṇa*. The place where the mind can be separated is the hippocampus which is the transfer of information from short-term to long-term memory.

When this consciousness operates with the eye, it runs through the optic nerve. In Buddhism, this consciousness is identified as *cakkhu-viññāṇa*. This consciousness only operates when an object is contacted. *sota-viññāṇa, ghāna-viññāṇa, jivhā-viññāṇa, kāya-viññāṇa* and *mono-viññāṇa* operate through the auditory nerve, olfactory nerve, taste nerve, body nerves and mind nerves respectively. Therefore, the senses; eye, ear, nose, tongue, body and mind are operated by the *viññāṇa*. In modern science, as a development of electro-biology, it has been identified as an electrical power.

When the mind and mind-consciousness, *mano* and *mano-viññāṇa* operate, the *citta* operates, just like when the power comes to the bulb, the light is produced. As this

is a quantum in nature, it is difficult to identify them separately. However, in modern science with the development of quantum physics, the characteristics of consciousness have been studied satisfactorily.

> The behavior of Consciousness is akin to the behavior of an electron in and out of an atom. Electron which is a quantum entity can remain localized inside an atom by quantum mechanical interaction with the electromagnetic field around the atomic nucleus, which itself is quantum in nature, so long as the energy of the atom's quantum state it occupies matches the energy possessed by the electron. Whenever the energy of the electron does not match, it has to shift to another matching state or leave the atom and start floating as a free electron.[14]

The characteristics of *viññāṇa* discussed in Buddhism are somewhat similar to the explanation given above. In Mahāvedalla Sutta, how *viññāṇa* depends on *āyu* and *usma* is given. In the same way as the energy of the electron does not match, it leaves, the *viññāṇa* also leaves.[15]

If we take *citta*, *mano* and *viññāṇa* as similar in meaning, the teachings of the Buddha would be questionable. Because each word delivered by the Buddha has its own meaning. Therefore, it is our duty to define and reinterpret them considering the time and situation, and direct and indirect methods (*nītatthaṃ* and *neyyatthaṃ*).[16] (What about the opinion that some scholars suggesting in certain context they are utilized as *pariyaya* ?)

> Brainwaves underpin almost everything going on in our mind, including memory, attention and even intelligence. As they oscillate at different frequencies, they get classified in bands, such as alpha, theta and gamma. Each are associated with different tasks. Brainwaves allow brain-cells to tune in to the frequency corresponding to their particular task, while ignoring irrelevant signals, similar to how a radio homes in on different waves to pick up radio stations.[17]

Each neuron in the brain produces certain ideas, thoughts, views, mental elements, *cittas*, *cetasikas*, with the help of consciousness (*viññāṇa*). When we have a certain thought, the relevant consciousness operates simultaneously. When the short-term

memories become long-term memories, certain nucleus are produced in neurons. The process is given in Buddhism as mental proliferation (*papañcati*).

Conclusion

Therefore, there is no factual disagreement to reject that the thoughts are produced in the mind. However, what quite ignorant to identify is that the brain produces thoughts. According to the clarifications we have made throughout the paper, they are factual enough to accept that the brain, cerebrum, where the nucleuses are produced could be identified as the mind (*mano*).

Consciousness which operates each and every moment is *viññāṇa*. In Buddhism, *viññāṇa* has the characteristic of identifying, knowing the object as pleasure, un-pleasure and neutral. It does not mean that *viññāṇa* alone can identify an object, but it has that characteristic. It helps to identify the object. When we create an electro-magnet using a coiled iron, electric power does the major task. However, electric power alone can do nothing even though we observe that when the power is, the iron becomes a magnet. Since, this is a quantum in nature; there is a difficulty of identifying these distinctively. That is why, it is important to identify what is stated in Mahavedalla Sutta as that the consciousness identifies the pleasure, un-pleasure and neutral.[18]

The death of a being is occupied when certainty of the *āyu* or *usma*, or both are not supported one another. In other words, consciousness also exists according to the theory of quantum. If *āyu* and *usma* are not supported one another, the consciousness (*viññāṇa*) leaves, "Whenever the energy of the electron does not match, it has to shift to another matching state or leave the atom and start floating as a free electron".[19] The characteristic of free electron is similar to the *gandhabba*, which left the former life expecting a new life. Here, the *gandhabba* is also quantum in nature. It is not only the *viññāṇa*, but also the *kamma*. With the next life, *kamma* operates with the brain, cerebrum. When we live in the world, *kamma* operates with the mind and consciousness becomes the drive force. Because, all

these are quantum in nature, when the *cetana* produces, it causes to produce a certain nuclear in the neuron of the cerebrum. According the mental proliferation (*papañca*) made by the individual, a certain nuclear is produced, and in respect to the nuclear the electron is produced. In this way, the power of mind, thought and consciousness would be changed as high or lower. Accordingly, this process directly and indirectly causes to change the figure, nature, and the characteristics of the individual.

Abbreviations

A.N. - Aṅguttara Nikaya

M.N - Majjhima Nikāya

MRI - Magnetic Resonance Imaging

PET - Positron Emission Tomography

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Endnotes

[1] The Path of Purification, p. 456

The words *viññāṇa* (consciousness), *citta* (mind, consciousness), and *mano* (mind) are one in meaning.

[2] Dharmawardena

[3] Dharmawardhena

[4] Dharmawardhena

[5] M.N. i, 22

c*akkhuñcāuso paṭicca rūpe ca uppajjati cakkhuvuññānaṃ*

[6] Dharmawardhena

[7] Dharmawardhena

[8] Dharmawardhena

[9] M.N. i, 111

[10] M.N. i, 111

[11] Anthene

[12] Silva, 15

[13] Livergood and Norman

[14] Dharmawardhena

[15] M.N. i, 295

telappadīpassa jhāyato acciṃ paṭicca ābhā paññāyati, ābhaṃ paṭicca acci paññāyati; ime kho āvuso, āyuṃ paṭicca usmaṃ paṭicca tiṭṭhati, usmā āyuṃ paṭicca tiṭṭhati. āyu usma ca viññāṇaṃ

[16] A.N. i, 60

[17] Anthene

[18] M.N. i, 292

Vijānāti vijānātī'ti kho, āvuso, tasmā viññāṇanti vuccati. Kiñca vijānāti? Sukhantipi vijānāti, dukkhantipi vijānāti, adukkhamasukhantipi vijānāti

[19] Dharmawardhena