

Quantum Consciousness: A Scientific Theological Perspective of Sant Mat (Religion of Saints : Radhasoami Faith)

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Abstract

Human Cognitive consciousness, in some difficult to define sense is holistic in character. This gives hope that it can finally be explained in 'quantum' terms. Classical mechanics, on the other hand, does not naturally accommodate and adequately explain the dynamics of cognitive consciousness. Cognitive consciousness appears to exhibit "quantum" like qualities. However, this realization can come only when we look at the sub-atomic scale of cognitive consciousness where all regular solid structures disappear or dissolve into waves or waves of probabilities. The way we perceive the reality around cognitive consciousness as of now is basically an illusion or 'perceived reality'. A number of theories propounded in this regard aim to subscribe to the idea of "quantum neurophysics" explaining how the classical world of consciousness can originate from quantum processes inside the human mind/brain. Moreover, by introducing consciousness, one obtains a philosophically elegant resolution of the paradox of quantum measurement which says that 'probabilistic occurrences in the quantum world can be replaced by definite occurrences when they enter consciousnesses.

In the area of theological (Science of religion) research, following the architect and biomechanics of human brain, one needs to acknowledge the dynamic possibility of exciting, inducing or setting kinetic quantum conscious neurons through the performance of concentration meditation practices, prescribed as 'SURAT-SHABDA' yoga in the religion of saints (more precisely in Sant Mat: Radhasoami Faith) for

the awakening of a fairly dormant conscious-spiritual dynamics inside a human mind/brain and transforming it into an enlightened quantum brain.

Quantum consciousness can be understood as a Neuro-Spiritual phenomenon which is inseparably associated and in communion with the dynamic Genetic-physical existence of a human being. The present paper postulates a dynamic hypothesis and scientific exploration of quantum consciousness, it's neural-genetic correlate and the prospect of quantum computation apart from proposing a thrilling prospect of genetic engineering in order to evolve a perfectly compatibility human physical system in communion with the 'quantum conscious spiritual system'.

Keywords: Quantum Consciousness, Neural-Genome Correlate, Quantum Computation

Introduction

Human Cognitive consciousness, in some difficult to define sense is systemic and holistic in character. This gives hope that it can somewhat be explained in 'quantum' terms, as the classical mechanics, on the other hand, does not naturally accommodate and adequately explain the dynamics of cognitive consciousness. 'Quantum Consciousness' is one of those multidisciplinary areas of integrative systemic research where we borrow the principles of quantum physics and quantum mechanics to find answers for some of the most intriguing questions pertaining to cognitive consciousness. Most of the nineteenth century science was founded upon a "Newtonian Absolute Physics" which provided a description of the world as interplay of forces obeying immutable laws and following a predetermined trajectorial pattern. This was considered as the "billiard ball" view of the world. This comfortably solid and deterministic world view of the materialists has however been undermined by the new physics, and in particular through quantum science. Discovering the properties of sub-atomic matter, an element of probability had to be introduced into the physicists' calculations, and each sub-atomic event was characterized in itself inherently

unpredictable and uncertain - one could only ascribe a probability to the outcome. In the Quantum picture of the world, each individual event cannot be determined exactly, but has to be described by a 'wave' of probability. Thus the simple billiard ball model collapses at the sub-atomic level [1].

The famous equation of Quantum theory embodying Heisenberg's Uncertainty Principle is:

Planck's constant = (uncertainty in energy) x
(uncertainty in position)

I. Science of Quantum Consciousness and Neural Design

Seen from a distant macro perspective, we may have the impression about the pre-structured cognitive consciousness expressed in an exact and precise predictable way, but, in fact, cognitive consciousness does also exhibit, albeit at the quantum scale level, "quantum" like qualities. The way we perceive the reality around consciousness as of now is basically an illusion or 'perceived reality' and according to the quantum explanation, even the formation of so called deterministic consciousness structures can not be achieved through a linear deterministic route.

A growing number of investigators believe that the first step toward a science of consciousness is to discover the neural correlates of consciousness. Indeed, Neuro-Genetic scientists have gone so far as to proclaim that we need to discover the neural correlates of consciousnesses. In this way, Cognitive neuroscience can be found to be a branch of the scientific study of biological mechanism underlying cognition, with a specific focus on the neural substrates of mental processes and their behavioral manifestations. It addresses the questions of how psychological and cognitive functions are produced by the neural circuitry [2]. One of the strongest proponents of a theory of consciousness founded on Quantum

Theory, Sir Roger Penrose, a leading British physicist (in association with his American associate Stuart Hameroff) opined that consciousness must be a quantum phenomenon because neurons are too big to account for consciousness. According to him, inside neurons there is a "cytoskeleton" (also known as Corticons as primitive substance than neurons), the structure that holds cells together, whose "microtubules" (hollow protein cylinders 25-nanometers in diameter, Figure 1) control the function of synapses [3].

The hypothesis propounded by Penrose is also affirmed by the Japanese physicist Kunio Yasue and the American physicist Gordon Globus who claim that brain substrates uphold second-order quantum fields. Their idea is derived from the quantum field theory developed in the 1960s by another Japanese physicist Hiroomi Umezawa and on his concept of "Corticons" as more primitive substance than "neurons". We can call it 'quantum conscious neuron' and hypothesize it to be like a light or photon like entity- a superluminal (photogenic/ photonic) particle having dynamic quantum motions inside the gray-white matter of cerebral cortex. Hence, the above hypotheses primarily aim to subscribe to the idea of "quantum neurophysics explaining how the classical world of consciousness can originate from quantum processes inside the mind/ brain.

Quantum neuro-physicists also believe that the several layers of the brain can host quantum processes, whose quantum properties can effectively explain the dynamics of cognitive consciousness. They conceptualize the human brain as a macroscopic quantum system made up of sub-atomic structures such as microtubules which lie inside the neuron, and which contain quasi-crystalline water molecules that again lend themselves to quantum effects [3].

In the discipline of theology (Science of religion) too, following the architect and biomechanics of human brain, one can easily acknowledge the dynamic possibility of exciting, inducing or setting kinetic these quantum conscious neurons through the performance of concentration meditation practices, prescribed as 'SURAT-SHABDA' yoga in the religion of saints (more precisely in Sant Mat: Radhasoami Faith) for the awakening of a fairly dormant conscious-spiritual

dynamics inside a human mind/brain and transforming it into an enlightened quantum brain [4].

The possibility of such excitation and transformation is firmly founded on the postulate of the quantum neural states (super positioned wave like entities) having their own space-time geometry coined as 'objective reduction'. And, under special circumstances (such as in the case of electrical or concentration-meditation induced excitation), which microtubules of quantum neurons are suitable for, the separation of space-time geometry reaches a point-known as the quantum gravity threshold where the system must choose another state or collapse into other state.

Hence, when a quantum neuron system collapses from, say, a quantum superposition state of low consciousness to a state of high consciousness during the meditation process without any external environmental intervention or assistance, by objective reduction criterion (Figure 2), we sense out an internal intervention of a non-computable element in it causing the self-collapse.

Objective Reduction Postulate of Quantum Consciousness: According to Robert Penrose, Consciousness is an actual physical process, a sequence of quantum state reductions connected by $E=h/t$ to an objective threshold inherent in spacetime geometry. He further stresses that underlying structure of the quantum world embeds Platonic information and precursors of life and consciousness. As we all also know that Einstein had also stated that matter is equivalent to curvature in space-time, which also means not only at large scales, but at infinitesimally tiny scales – the basement level of the universe at the Planck scale... 10^{-33} cm. Penrose observed that quantum superposition – an object in two places/states simultaneously – equated to two space-time curvatures in different directions: a bubble or separation in the fabric of reality. But the separations are unstable, and after a time t (given by $E=h/t$) will spontaneously self-collapse to one curvature or the other (an "objective reduction" – O.R., Figure 3).

Enhancing and reaching to the higher quantum neural potential above the quantum gravity threshold level can be

closely associated to the state of “Trance” or Higher degree Consciousness as referred in the various religious literatures. The state of trance is described as the elimination or the cessation of the functions of the physical media resulting in spirits being endowed with higher powers of senses, foresight and access to a plane which is different from the planes of the three dimensions etc. [5]. This may also be attributed to the quantum spin carrying quantum information and different configurations of quantum spin geometry ultimately leading to varieties of quantum coherent ‘spiritual experiences’. This is probably why quantum consciousness has yet not been measured applying any physical measurement or it is not even conceivably measurable by the quantum computers. Note that in the case of external environmental intervention, as it turns out; the systems in quantum state can perform massively parallel and efficient computing and may collapse to the solution. This is the basis for so-called quantum computing which is currently a very live topic.

Several quantum scientists wonder about this non-computable element of self-collapse to be something they don't yet know about, something perhaps engrained as ‘God’s particle’ at the Planck scale and Time* from the Big Bang and something quite intrinsic to the creation of the universe. However, scriptures of Sant Mat (In particular, the Radhasoami faith, initiated by His Holiness Param Guru Huzur Swami Ji Maharaj, Agra) authoritatively describe it to be the current force of spirit, the current of life, the current of nectar and light and the current of Sabda (Sound) which is responsible for the elevation of an ordinary cognitive consciousness to a higher degree of quantum consciousness. On the other hand, it also collaborates with the spiritual thesis regarding the hidden potentiality of brain, which is as it were, the reservoir of nerve power, have other important functions to perform which are distinct form the functions of and sustenance of the physical frame [5].

We can thus infer that Quantum conscious neurons can be rendered ‘spiritually active’ by constant concentration training (meditation) towards the desirable optimum collapsing goal of consciousness awakening or absolute consciousness in the trance state of mind. In other word, access to these quantum

consciousness states originates when a self-organizing process (the objective reduction) somehow coupled with neural activity collapses quantum wave functions at Planck-scale geometry. On the above lines of the excitation theory, In 1986 John Eccles, the British neurophysiologist who discovered neurotransmitters, had also speculated that synapses in the cortex respond in a probabilistic manner to neural excitation, a probability that could well be governed by quantum uncertainty given the extremely small size of the synapses "microsite" that emits the neurotransmitter.

[*Planck Scale and Planck Time: Max Planck in 1899 gave two constants: Gravitational constant and Planck constant. Planck scale under Planck constant equals to 10^{-35} meter whereas Planck Time equals to 10^{-44} Seconds. It is pertinent to note here that according to quantum physics, at Planck Scale, all the laws of universe (Electromagnetic, weak and strong nuclear force and gravitational force) come as unison – The grand unified field theory (GUT symmetry) - and can be applied to explain virtually everything that exists in the known universe.

It may also be indicated here that in the process of meditation, repeated or continuous quantum synaptic activation can result in alteration of the physical structure of neural synapse itself and hence, may bring about a permanent and radical change in the human consciousness and spiritual awakening via a neural mechanism of synaptic plasticity. Here, the extensive mutual networking of neural synapses of an activated bunch of quantum neurons and their corresponding synapses can also awaken 'weak neighbour neurons' having dormant or very low synapse not reaching to the quantum consciousness threshold for action potential initiation. It can be facilitated by a simultaneous firing or bursts of action potentials of trained and activated consciousness neurons (through repetitive meditation practices) initiating "awakening impulse" in their cells where quantum neural synapses are weak, dormant or even dead. It can be termed equivalent to the Hebb's biological learning law, according to which the more frequently activated synapses strengthen, while those ones less frequently activated weaken.

As a quantum equivalent of the neural summation process, the "self-collapse" of quantum neural state results in particular "conformational states" that may further regulate neural processes. These conformational states can interact with neighboring states to represent, propagate and process information and each self-collapse corresponds to a discrete quantum conscious event taking place under cortical brain [6]. Sequences of such events then give rise to a "stream" of enhanced quantum consciousness. In nut shell, the quantum neural phenomenon controls the cognitive consciousness operation of the brain through its underlying quantum coherent state which is speculated by neurophysicists and scientists to be arranged systemically in space-time geometry at the fundamental Planck scale and that a self-organizing Planck-scale process results in quantum consciousness in humans or better to say, across the humanity.

II. Quantum Consciousness & Genetic Framework

Genetic Correlate to Quantum Conscious Neurons

In his discussion about the neural underpinnings of consciousness, Francis Crick, co-discoverer of molecular sequence of nucleic acid (DNA) had once said- "You are nothing but a pack of neurons" [7]. Now it is established that neurons are basically the expressions of genes and hence, the building blocks of brain including quantum conscious neurons. Recent advances in the emerging field of imaging genetics have demonstrated a much tighter link between genetic makeup and the functioning of brain and mind. Genes not only control the development of neurons to make up brains, but they also govern neuronal gene expression during our daily lives. It may thus be safely hypothesized that quantum conscious information loaded over the quantum spins as elaborated in the previous section, derives its quantum properties through its genetic encryption or coding pattern. It has also been speculated that "if consciousness is a definite, inheritable characteristic, it must have had survival value for it to evolve. It then follows that consciousness must be en-coded somewhere in our genes [8].

Genes are also said to be virtually responsible for every step of the neurotransmitter cycle, including the formation, transport, pre-synaptic expression and post-synaptic reception of the transmitter. It further reiterates that, genes thus operate at every level of the neural process. They can indeed be treated like fundamental building blocks for both the structure and the functioning of the brain and set the stage for how neurons and functional groups of neurons act in response to different inputs.

Genetic Dualism of Quantum Consciousness

It has been hypothesized that, every quantum behavior of cognitive consciousness shall have a dual characterization as self-governing super positioned coherent entity grounded on the genetic platform. The consciousness problem is, therefore, made of two parts, one that deals with the quantum expression of cerebral neurons and the other that deals with how/why those expressions originate. This dualism proves that consciousness is an expressed and potentiated feature of human brain which is somehow related to its genetic properties. It also states a tight relationship between the quantum structure of consciousness and its genetic or functional organization in the form of Genome. From these principles, it follows that manifestation of quantum consciousness is due to the genetic and functional organization of the brain. What it also suggested is that quantum consciousness doesn't come simply from the act of putting cerebral neurons together by magic. Although it is a fundamental property of human neurons, its quantum conductivity depends on the proper circumstances to take place or say, genetic constitution to build in the human genome in order to derive the optimum results.

The neuro-genetic thesis of quantum consciousness proposed here can further be validated on the Darwinist theory of human evolution. If we assume that a similar law of evolution is responsible for all living phenomena, from the creation of species to the physiological system, and we admit that mind is one of them, then, a possible scenario of neural-genome interface emerges, which is compatible with our

hypothesis. In nutshell, quantum consciousness engrained in human mind is a mental equivalent of a genetic thread. Similarly, if quantum consciousness comes from a fundamental property of matter or say, human genome, then, we can study why and how, under special excitation circumstances (as described in the earlier section), that very property enables a particular configuration of matter (the cerebral neuron) to exhibit quantum consciousness.

The basic postulate here is, as we know, genes predispose to various ailments and diseases much before their actual and physical manifestation in the life of a human being and this has been proved substantially and authoritatively through the research findings of the human genome projects carried out in number of countries where scientists have succeeded in sequencing the human genome. Following this line, we can also say that cognitive consciousness might also be coded somewhere in the human genome knowing the genetic-neural gateway and transmission mechanism. This theory, however, admits the existence of quantum consciousness as separate from the physical properties of neural matter as we know them, but, at the same time, we also need to accept quantum consciousness arising from a physical genetic property of humans that behaves in a fundamentally different way from the physical genetic properties of other low conscious species. So, in a sense, quantum consciousness is not a "physical" property, but it is still a property derived from its constituting genetic physical matter. It can be reiterated here that although neural wiring in human brain is carried out by processes that are derived from the genome, but the information for this wiring is not entirely contained within the genome itself. Rather, a human brain develops by a progressive sequence of steps each involving interplay between genetic programs and environmental influences as propounded in the Darwin theory of evolution.

Quantum Uncertainty and Genetic Certainty

The famous equation of Quantum theory embodying Heisenberg's Uncertainty Principle emphasizes that in the quantum picture of the world, each individual event cannot be determined exactly, but has to be described by a 'wave' of

probability. However, if we trace the evolutionary placement of neurons in the human brain migrating and developing axon connections from early childhood to maturity in a human being (as discovered by the human genome project, mapping genome sequences all over the world), we have no choice than to draw a conclusion that the Nature is highly deterministic in all instances of specificities including the arrangement of cerebral neurons firing quantum pulses of consciousness. Nonetheless to say that certain genes in the human genome have a unique function in space and time in developing quantum neural consciousness in the brain as hypothesized earlier in the section 'quantum conscious neurons', but that too must also be under the dynamic evolutionary influence of the environmental factors.

Genes are, therefore, fundamental for they constitute the basic neural framework and leading the way we experience quantum consciousness. It is no wonder that the DNA has been reported to emit electromagnetic radiation (photons) in the microwave spectrum (1-4 billion cycles per second derived from the electricity that is flowing through our nervous system and spinal cord) and hence it may also carry a message to the quantum conscious neurons having photon receptors or neurotransmitter receptors through 'electrical synapses' which exist much less in number than chemical synapses in the neural arrangement but are more reliable [9]. This conceivably builds a tunnel of DNA-Photon exchange through Cognitive-Cerebral gateway.

Going by the same premise of Microcosm-Macrocosm theory elaborated in the faith of saints, it is suggested that the human physical body possess those genotype-phenotype patterns of DNA, which can emit a radiation of higher order, building an inseparable communion with the consciousness photons (neurons), thus, evolving into a quantum conscious Neuron-Genome gateway.

Illusion or Perceived Reality?

It would be prudent to bring back here the issue of perceived reality or impressions about the pre-structured and deterministic cognitive consciousness versus quantum consciousness. The fact is when we measure a quantity in a

quantum state, we unconsciously apply subjective reduction, which means that though the system itself is not in any specific state, rather it is in a quantum position of possible states (wave form), but at the point of observation, the observation causes the quantum state to reduce or 'collapse' to a specific state giving an impression or illusion of its static manifestation. The American physicist Henry Stapp also holds that the Quantum Theory does not talk about matter, it talks about our perceiving matter. Stapp, here, rediscovers George Berkeley's idealism - "we only know our perceptions (observations)" [10].

III. Computation of Quantum Consciousness

The Brain as Measuring Device

In 1989, the British psychiatrist, Ian Marshall suggested that consciousness in human brain may arise from the excitation of a sort of condensate (such as Bose-Einstein or Froelich-style condensate) and, whenever the condensate is excited by an electrical field, conscious experience occurs. In his opinion, the brain would maintain dynamical coherence thanks to an underlying quantum coherent state which is precisely due to the properties of such a condensate. Scientifically measuring, the best neuro-physiological correlate of consciousness (NCC) comes from EEG (Electroencephalography. Figure 4), voltage fluctuations recorded from scalp or brain surface. EEG is divided into frequency bands: Delta (< 4 Hz), Theta (4 to 8 Hz), Alpha (8 to 12 Hz), Beta (13 to 30 Hz), Gamma (> 30 Hz) and Coherence in gamma synchrony among different brain regions may be described as the most appropriate correlate of physically measurable quantum consciousness.

According to John Dunne, Emory University, "... consciousness itself is only momentary... a sequence of moments..causing each other...each moment of consciousness only lasts for a very short period of time. A very advanced meditator... is able to detect the transition from moment to moment... They are..1/64th of the snap of a finger". Buddhist writings are also known to quantify the frequency of conscious moments. The Saarvastivaadins describe 6,480,000 moments

in 24 hours (one moment per 13.3 seconds = 75 Hz), and Chinese Buddhists as 50 'thoughts' per second (50 Hz). Note that Gamma synchrony EEG is 30 to 90 Hz.

At the quantum level, it is hypothesized that the computation of quantum consciousness is possible through the protein qubits orchestrated by synapses inside the microtubular arrangement of neural circuitry (Figure 5).

Hence, the brain is, in effect, treated as a Heisenberg-type quantum measuring device, according to which, the mental life of each human being is representable as a sub-sequence of the full sequence of Heisenberg events. The neural wave function enfolds superposed possibilities, and then consciousness chooses one classical branch and annihilates the others [10]. However, some even propose that there is no consciousness with a random core like above. Instead, consciousness is cybernetic. Scientists maintain that the evolution of the quantum wave function of neural circuitry is not random, but optimized under a principle of "least neural action". In this way, the random effects of quantum consciousness can be replaced by a "cybernetic" quantum consciousness operating as a free-willing agent. This also gels well with the earlier idea, giving rise to a remarkable and dynamic possibility of existence of genetically engrained quantum neural phenomenon in the human brain. Under the cybernetic approach, consciousness participates in an interaction [11]. According to this, consciousness is a quantum eruption offering possibilities to the match with sensory input and thus with reality. Therefore, mental states are not randomly chosen in mental acts but conserve real symmetry and evolve under optimal control (i.e., minimization of the neural action). We can thus infer that 'Cybernetic consciousness' here is fully consistent with the physical principles of quantum field theory and the spiritual thesis of God's grand design.

Whichever ways; by introducing consciousness, we can conclusively recognize that brain substrates uphold second-order quantum fields, and so should not be treated as ordinary physical measuring devices. One definitely obtains a philosophically elegant resolution of the paradox of quantum measurement which says that 'probabilistic occurrences in the

quantum world are replaced by definite occurrences when they enter consciousnesses. This implies that Schrodinger's cat (a quite infamous paradox of 'half dead-half alive cat' propounded by Schrodinger to explain quantum uncertainty) becomes definitely dead or definitely alive when a conscious being sees it. [12]. In other words, coherent super-positions, the multifaceted quantum waves, exist in the transcendent order until consciousness brings them to the world of appearance with the act of observation and, in the process, consciousness chooses one facet out of two, or many, that are permitted by the mathematics of quantum mechanics. Hence, consciousness is not about doing something to objects via observing, but consists of choosing among the alternative possibilities that the wave function presents and recognizing the result of choice.

This conscious 'selection' is a continuous process happening inside human brain, which also has a measurable physical channel of manifestation. Collaborating to this quantum manifestation of human brain, it has long been known that the global electrical activity of the brain is characterized by distinct oscillatory components at different frequencies and that they correlate well with such large functional states as wakefulness and sleep and during the period corresponding to REM sleep (in which a subject, if awakened, reports having been dreaming), 40-Hz oscillation similar in distribution phase and amplitude to that observed during wakefulness is observed [13].

Thus, it proves that quantum consciousness has some direct physical effect and one may then hypothesize that the entropy reduction of arrays of possible states by human consciousness is correlated with those changes the states of conscious systems which correspond to conscious acts. This further connects to the assertion of the present research that consciousness is a process which is part of the dynamics of certain physical systems under 'an intelligent design and supreme guidance' expressing itself physically through neural-genome gateway.

Therefore, the uncertainty surrounding quantum consciousness exhibits our own conscious choice that we make

and the nature replies only what we ask from it. It doesn't at all mean we have a degree of control over Nature or its quantum manifestations. We should also never forget the prime fact that all mind/brain properties and the hidden potentials at microcosmic level are subordinate to the 'spirit force' which supplies to them all the needed energy and intelligence and bliss to realize whatever is contained within or manifested outside as its physical organization. In fact there is no contradiction theory so far as we are able to understand the gradation and potential difference existing between the super quantum 'spirit entity' and that of human mind and their internal communion and relations.

Future Research: Designing and Developing Quantum Conscious Genome -

Based on the above discourses, altering the DNA genome to create a perfect compatibility of a human physical system with that of the quantum conscious spiritual system might prove to be another very exciting field of scientific and theological exploration. The basic claim here is that a genetic pool of a given population potentially contains the solution, to a given adaptive problem i.e. evolution of Spiritually Conscious SUPERMAN (an idea propounded in the religious literature of Sant Mat). This solution might not be "active" because the genetic combination on which it relies is split between several subjects. Only the association of different enlightened genomes can lead to the solution. No subject has such a genome, but, God willing and only 'God willing', during reproduction, crossover or even through sudden mutations, new genetic combination occurs and, finally, a subject can inherit a "Super gene" from 'super' parents. Through this process of recombining genes, organisms can produce offspring with new combinations of maternal and paternal traits that may contribute to or enhance survival-fitness. So, towards this end, we may propose to possibly design a genetic map for our 'Quantum Conscious Genome' carrying genetic map of a quantum conscious - SUPERMAN possessing a very high grade of Physical, Intellectual, Emotional and Consciousness Quotient.

Conclusion:

It can be inferred from the above account that all the individual entities in the universe, matter or non-matter, are in constant systemic interaction with each other in a multifaceted coherent manner under the supervision of the supreme 'spirit force' by exhibiting the quantum properties at the microcosmic and macrocosmic levels. Their properties are however manifested under space-time geometry and unaffected by whatever is the space time separation between them. In the same manner, Quantum consciousness can be understood as a Neuro-Spiritual phenomenon which is inseparably associated and in communion with the dynamic Genetic-physical existence of a human being.

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Caption for Figures

Figure 1 - Microtubular Neural Structure

Figure 2 - Objective Reduction Self-Collapse propounded
by Penrose-Hameroff

Figure 3 - Sequence of Preconscious-Conscious Events

Figure 4 - Electroencephalogram Measurement

Figure 5 - Quantum computations in microtubules
orchestrated by synapses- Orch OR

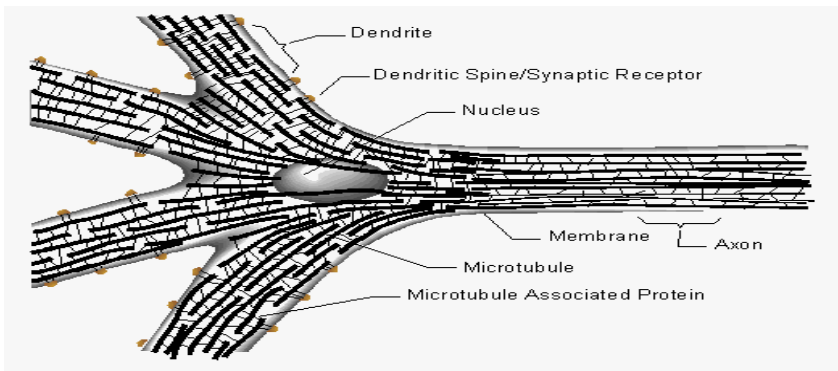
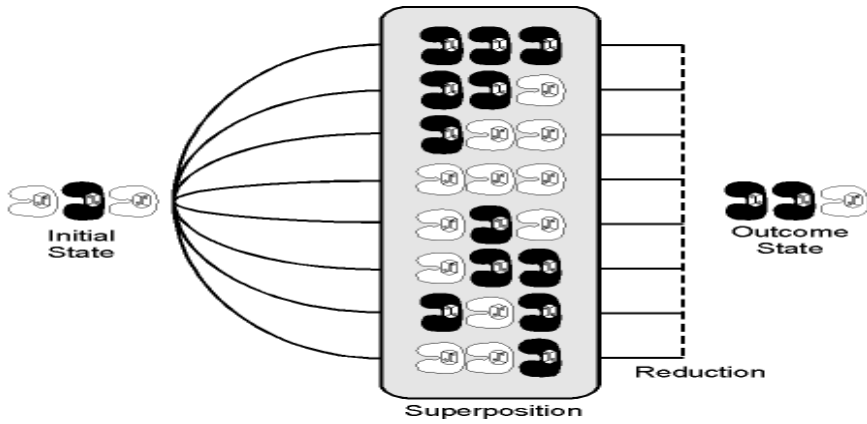


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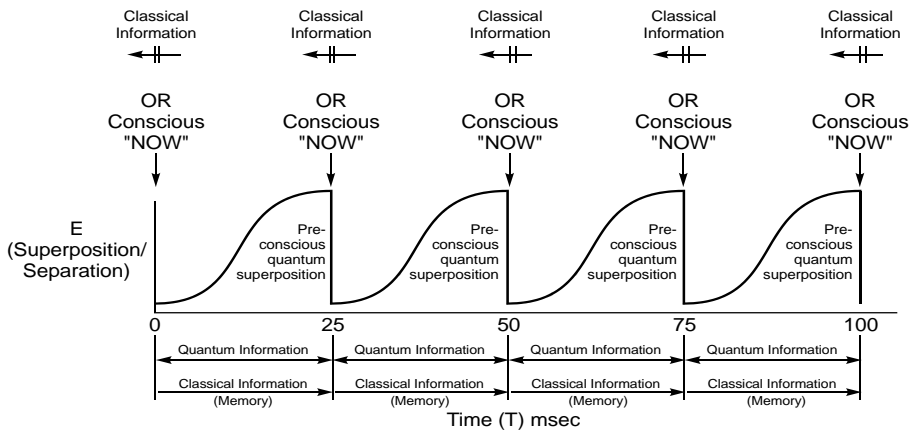
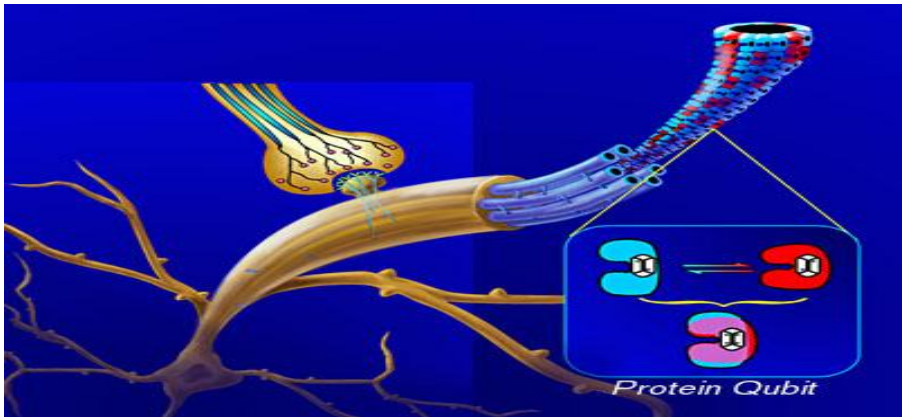


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