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Guest Editorial

Time for Quantum Consciousness

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ABSTRACT

The consciousness is the basis of our reality and our existence, but the mechanism by which the brain generates thoughts and feelings remains unknown. Most of the explanations depict the brain as a computer, with nerve cells (neurons) and their synaptic connections acting as simple switches. However, the calculation alone cannot explain why we have feelings, awareness and "inner life". Indeed, neurophysiological processes and phenomena of the mind are now among the biggest unanswered questions in science. It is time for quantum consciousness.

Key Words: quantum consciousness, mechanism, mind, computer, thought, feeling, reality.

Introduction

In the Hu's editorial published in 2008 (Hu, 2008a) he refers to a general reflection on the current values of Science and Religion: *"The very revolutions have created a deep gulf between Science and Region as reflected by increased hostilities and seemingly irreconcilable differences between Science and Religion. The very same revolutions have also produced dogmas, arrogance and intolerance of alternative views in Science. On the other hand, the enterprises of Religion seem to lack innovations and are unable to cope with or adapt to the new environments".* Now is the time to make real progress in Science and Religion. It is a call to free knowledge, an appeal to the humanity to move towards the "Knowledge Society".

In a subsequent editorial Hu (2010b) extend his reflections to the status of research on consciousness: *"…because our state of consciousness is the catalyst for the transformation of humanity at the dawn of 2012 and the missing link on the pass to truth."* He wrote: *"…in mainstream sciences the study and even the mentioning of mind or consciousness are till taboo and indeed the physicists' version of a theory of everything does not include consciousness. However, physicists encountered consciousness more than eighty years ever since quantum mechanics was born (Rosenblum, 2006). Instead of embracing such encounters and exploring the mystery of consciousness, the majority of physicists have been avoiding the consciousness issue like a plague".*

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Fortunately, not all the physicists feel the same way, on the contrary there are radical idea, such as those of Manousakis, which derives the foundations of quantum mechanics from consciousness. (Manousakis, 2006). This approach is not new you consider that Planck (1931) had also concluded: *"I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness".* Hu also has formulated his theory of consciousness (Hu, 2004).

The consciousness is the basis of our reality and our existence, but the mechanism by which the brain generates thoughts and feelings remains unknown. Most of the explanations depicts the brain as a computer, with nerve cells (neurons) and their synaptic connections acting as simple switches. However, the calculation alone cannot explain why we have feelings, awareness and "inner life". There are many quantum theories based on the common premise that "quantum mechanics" can help us to understand the mind (particularly consciousness) that the "classical mechanics" cannot provide (Vannini, 2008; Smith, 2009) by those theories emerge possible formal descriptions of the most basic mental manifestations, namely, the subjective experience of the process of perception (Manousakis, 2009).

Neurophysiological processes and phenomena of the mind are now among the biggest unanswered questions in science and Tarlaci, editor of the NeuroQuantology Journal wrote a recent testimony to the importance of quantum physics in the field of cognitive neuroscience (Tarlaci, 2010).

A Radical View of Quantum Consciousness

Quantum physics and cognitive-behavioral and Eastern philosophies are recognizing that the reality of space-time that we perceive is only a possible processing of our ordinary consciousness. Just think of how it looks different the space-time and therefore the perception of our reality under the influence of drugs able to alter the state of ordinary consciousness. To understand this view of the universe has been introduced a fundamental element long-overlooked: "*The Information*". The content of information is the basis of this and all other possible universes. An immense information would be compressed to a scale infinitely smaller than the size of subatomic particles, in what is called "*non-local quantum field*", self-organization of quantum information would be able to generate self-awareness and even space-time itself. The basic unit of this quantum information is called Qubit. According to this theory, consciousness is not a phenomenon exclusive to humans, but belonging to each particle in this universe. More or less complex aggregates of particles would characterized by streams of consciousness (quantum information), different in their nature and on different time scales. This allows to attribute to any organism living or not such as the materials (including the planets, stars and galaxies) a content of consciousness, though very different in nature from each other. For each entity the perception of physical reality will be different as well as communication.

According to classical physics, communication is possible, effectively, only among beings who share the same state of consciousness. According to quantum physics, through the phenomenon of entanglement, the communication can occur instantaneously between particles very far from each others in a non-local fashion whereas, according to the classical view, this it should be possible only between living entities at a distance compatible with the times of the signal transmission. Applying this new vision of reality, the anthropocentric concept of man would be demolished and a fundamental concept of Eastern philosophy would be introduced: all is one and anything cannot be isolated from the rest of the universe.

Quantum Biology

Dr. Stephen Hawking says: "*Humans have existed as a species for less than a million years and we are, as far as we know, the only species on Earth that has even the vaguest notion of physics. We only discovered the atom and learned to unleash its power within the last century. Our understanding of quantum mechanics is rudimentary, at best, yet we are on the verge of developing practical quantum computers that promise virtually unlimited computational power*". While many physicists are trying to get a quantum computer capable of operating at low temperature, other researchers have shown that bacteria and algae are capable of performing quantum computations at normal temperatures for the life from billions of years. First came the news that the birds can see magnetic fields, thanks to quantum effects (Kominis, 2008), it now appears that the pigments used to seize the light in photosynthesis, are able to perform quantum computations (Collini, 2010). The evidence comes from a study on how light energy travels through the molecules involved in photosynthesis. The work was released in February with the announcement in Nature journal that these unique molecules in a seaweed can take advantage of quantum processes at room temperature to transfer the energy without loss. Physicists had excluded this possibility because the heat destroys an effect called quantum coherence. The implication is, as Hameroff and Penrose (Hameroff, 1996, 2010) have told from 15 years, that we may have in our neurons some functioning quantum computers inside the so called "Schrödinger Proteins".

Gregory Engel had shown the same principle in 2007 at the University of California, Berkeley, even if at a temperature of -196°C. His team had developed a complex of batterioclorofilla sulphurous green bacteria discovering that the pigment molecules were linked together in a quantum network. His experiment showed that the quantum superposition allows the energy to explore all possible routes and then choosing the most efficient (Engel, 2007). Engel and his group in Chicago have just repeated the experiment at 4°C and found a quantum coherence of about 300 femtoseconds. (Panitchayangkoon, 2010)

Quantum Paradigms of Psychopathology

A new window into the nature of mental illness may have opened with the recent publication of an on-line symposium entitled "*Quantum Paradigms of Psychopathology*" (QPP), which appeared in March of this year as a special issue of the NeuroQuantology Journal. QPP's novel approach seeks a grounding of psychiatric disease in the counter-intuitive but physically foundational phenomena of the quantum micro-world within the brain. The relevance of physics on that small scale to sentient processes in the normal brain has been an ongoing subject of study since the closing decades of the last century. Pioneers like the physicists Hiroomi Umezawa (Ricciardi, 1967) and Kunio Yasue (Jibu, 1995), mathematicians like Roger Penrose and biomedical investigators like Stuart Hameroff (1996), Gordon Globus (2009) and Gustav Bernroider (2005) have plumbed the depths of subatomic structure and its macroscopic amplifications in search of substrates for quantum computation and other capabilities that may match attributes of the human psyche better than models advocated by conventional cognitive neuroscience. One especially powerful set of insights into the quantum brain has been contributed by Giuseppe Vitiello, his influential book, *My Double Unveiled* (Vitiello, 2001) has helped to weld the disparate disciplines of quantum field theory, thermodynamics, and neurophysiology into a so-called "*dissipative quantum theory*" of the conscious brain. The crux of his perspective is the hidden, virtual existence of a shadow brain operating in a time-reversed mode to stabilize the quantum coherence of neural memory structures. The March 2010 on-line QPP symposium is the culmination of a related project that began in June 2008. At that time Donald Mender conducted an informal poll of participants in Quantum Mind, a series of conferences exploring the ideas introduced by Hameroff, Yasue, Vitiello, and others. Mender asked whether there exists among researchers any interest in the prospect of applying insights from Quantum Mind to aberrant processes underlying schizophrenia, bipolar illness, and other forms of psychopathology. The answer was a robust "yes". Nine fertile texts appeared in the resulting symposium. In his lead target article, Globus (2010) propounded a highly original concept of schizophrenia linked to the "tuning" of quantum vibrations suffusing the brain. Woolf and Tuszynski, offered credible links between psychopathology and quantum-computational dysfunction within the skeletal proteins giving shape to brain cells (Woolf, 2010). Pylkkänen related the physical substrates of mental illness to quantum "pilot waves" and analyzes in detail the significance of Bohm's ontology for quantum paradigms of psychopathology. (Pylkkänen, 2010). Mender himself proposed ways of comprehending the neurophysiology of disordered thinking and emotion in terms of quantum analogies to the freezing and melting of ordinary matter employing the language of quantum phase transitions and the quantum epistemology of Von Neumann, Wigner, and Stapp (Mender, 2010a; Stapp, 2004). Five commentators on these four target papers each introduced additional fresh quantum perspectives on the biophysical origins of psychopathology. A further commentary by Mender on this important monograph number of Neuroquantology has been recently published (Mender, 2010b). Plans are under way for expansion of QPP's act ivies both on line and at live symposia. Pregnolato's recent assumption of the QPP Chair affords contributors yet another forum for internet-based discourse through his Quantumbionet web site. Face-to-face conferences will likely occur

in years to come either through umbrella networks or as free standing meetings. The next few decades promise progress in this new area of scientific exploration.

Schizophrenia

Schizophrenia is a severe psychiatric disorder expression of serious harm to the person's mind which is characterized by an alteration of perception and examination of "reality". Hallucinations, delusions, disorganized thought, and various cognitive impairments have been described in this 'disconnection syndrome', but similar principles are likely to apply to depression and ADHD (attention deficit hyperactivity disorder). All these diseases are associated with impaired co-ordination of neural population activity, which manifests as abnormal EEG (electroencephalogram) and LFP (local field potential) (Jones, 2010).

The symptoms of acute schizophrenia are by their nature the aberrations of conscious experience (Pert, 2007). As reported in a recent Ciba Foundation Symposium (Bock, 2007) current theories on the mechanisms that underlie schizophrenic manifestations differ in their relation to four levels of description: the neuroanatomical, neurochemical, cognitive, and the symptoms. However, what emerges is the current lack of a basic theory of shared links between the occurrence of conscious events and neural bases of the brain, the problem formulated by David Chalmers, known as "The hard problem" (Chalmers, 1995). This problem makes difficult if not impossible to think of theories that touch the foundation and the causes of these symptoms. The research of Paola Zizzi and Massimo Pregnolato, wants to demonstrate how the "quantum theory" and the "basic logic" can provide useful insight in this problem and how they could help us get closer to the construction of such theories.

Major Depression

Among the articles published in the March issue of Neuroquantology the paper of Tonello and Cocchi (2010) open new question among the possible connection between the biological structure of the cells and the quantum consciousness. Gas-chromatography analysis on blood samples of over 200 people including depressed (with clinical psychiatric diagnosis) and healthy allowed to determine the levels of specific fatty acids in the platelets membrane. The data were then processed by an artificial neural network, the Kohonen Self Organizing Map (SOM) yielding a classification of subjects with major depression versus the normal. According to the fatty acids triplet identified by the SOM, there are evidences that the identification on the map, states for saturation or instauration of the platelet membrane and instantly qualify the subject status in “normal” or “depressed”. This research is still ongoing to correlate the biochemical basis of depression and the Quantum Cytoskeleton Nanowire Network (QCNN) as suggested by the Penrose and Hameroff quantum consciousness model, or the membrane viscosity itself as suggested by the Hu’s model. The measurement of gamma synchrony, coupled with quantitative analyses of the platelet fatty acid triplet and supplemented by the SOM, may serve as a new test for determining quantum correlations with aberrations characteristic of psychiatric illness (Cocchi, 2010).

Biovitalistic's Renewal of Knowledge

On the 24th of September 2010, the President of the Italian Republic awarded Prof. Massimo Pregnolato with "Giorgio Napolitano Medal" which he shared with Prof. Paolo Manzelli for activities in Quantumbionet/Egocreanet and their connections with the international project "*Florentine Renaissance for a new Measurement of Humanity*" (FRNMH). As Manzelli says: the birth of modern science began with Galileo Galilei and gave impetus to ideas of "mechanics" in nature that have proliferated during the industrial era on the basis of the "quantitative measurements" of science. This mechanistic conception coincides with the idea of the definitive overcoming of "Vitalism-Renaissance". Today Egocreanet/ON-NS&A collaborators summarize that this "mechanical" approach offers a partial and narrow view of "Life Sciences" because induce new scientific and cultural barriers overly influenced by concepts that were useful for the production of industrial machines, now in obvious crisis also for the progressive "entropic destruction" of the ecosystem. Therefore, the "mechanical" concept does not take into account the complexity of "Life Sciences" and also forbid the inescapable aspects of modern Bio-Vital renaissance, who shared and addressed appropriately trans-disciplinary art and science culture, as become indispensable today to focus very important aspects of contemporary life, such as the defence of the quality of foods, biodiversity in nature and more, which together preclude to the development of Knowledge Based Bio-Economy (KBBE European Strategy). On the renewal trans-disciplinary 's art and science, we landed in an innovative formulation of science coined by Alberto Olivero as "Bio-Vitalism" (Pregnolato, 2010). The innovative aspects of social, economic and cultural meeting of the current proposal, that is included in the FRNMH Project, are intended to implement an open discussion on the topic: "*Life Science 2010: The Bio-vitalism in Renaissance Science & Art*". As a matter of facts this new meeting tends to explore strategies and opportunities for development of life sciences in the era of Knowledge Based Bio-Economy, associated with the actual implementation of the Green and Blue-Economy-Economy of the sea (Manzelli, 2010).

Robert Pope attempts to establish a Social Cradle to promote the FRNMH Project are generating matters of international interest (Pope, 2010).

In essence, we realized that it is time to overcome the reductionist logic and expressions of mechanical science that dominated the industrial age that have widened the gap between nature and culture, creating obvious dangers for the survival of life and biodiversity of our planet. This strategic goal and to take forward the development of a cognitive innovation so that new ideas and design to participate can lead to a profound revision of the horizons of creative development, individual social and economic development. The challenge for the regeneration of learning in terms of "Bio-vitalism" can be achieved by structuring a series of forms of participatory learning in the classroom or online, initially aimed to the aggregation of individuals, associations, publishers and entrepreneurs interested in develop new knowledge and to create conceptual models for the science and art of the XXI century.

Currently those who want to join the idea proposed by Pregnolato, may proceed through a continuous involvement in network (use of Facebook and other online tools) directed to propose a series of blogs interconnected to build 2.0 e-learning modules based on trans-disciplinary bio-vitalism. These are the reasons to say that it is time for quantum consciousness to take off in the scientific world and beyond.

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