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Conceptualising the Structure of the Biophysical Organising Principle: Triple-Aspect-Theory of Being

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Abstract

When examining the human being as a conscious being, we are still to arrive at an understanding of, firstly, the conditions required whereby physical processes give rise to consciousness and secondly, how consciousness is something fundamental to life as an intrinsic part of nature. Humans are complex organisms with myriad interacting systems whereby the convergence of the activities toward the support and development of the whole organism requires a high level of organisation. Though what accounts for the dynamic unity of the human being? From an empirical perspective the question remains unanswered. The aim of this paper is conceptually establish a fundamental biophysical organising principle to account for the unity and organisation of the human being. To this end I draw from David Bohm's interpretation of quantum theory to provide an adapted and adjunct conceptual scheme in the form of a Triple-Aspect-Theory (TAT) of Being as a grounding ontology. David Bohm presented a holistic view of two interwoven orders of existence defined as the Explicate material world and the Implicate (quantum) enfolded world from which the former materialises. Consistent with David Bohm's idea that matter at a fundamental level consists of a kind of protointelligence, the TAT facilitates a perspective based on aspect conditions of the human organism intended to furnish an explanation of the constitutive mechanism (TAT) inherent in the evolving human being. The TAT operates as an organising principle by which evolution inherently proceeds and maintains itself in an interactive relation between the Implicate and Explicate orders. The accumulated effect of natural selection is to produce adaptations, but without an organising principle: 'Consciousness', 'Body-of-Experience' and 'Intellect-Reflective' (the terms for the engaged coexistent aspects of being) it is argued could not occur.

Keywords: Triple-Aspect-Theory, Consciousness, Biophysical Organising Principle

Introduction

This paper continues and builds upon ongoing research and ideas established in a series of earlier works, the most recent titled *Ontology that Matters: Binding relations* (2011). The aim of this paper is to establish the conceptual basis of an organising principle of conscious development employing a process philosophy. Life evidently organises itself and if this were not true we would not be here. So how does it do so? Thomas Aquinas, in further developing Aristotle's matter/form theory, which subsequently became for Aquinas a moderate dualism, claimed that the *form*, or soul, of a living thing is, as for Aristotle, the ultimate 'life principle within the living thing' (Reichmann 1985:238). Similarly, I contend that life does follow an organising principle however one based on three aspects of being whereby consciousness is considered primary and fundamental in nature. This project follows the task set by many recent thinkers in terms of understanding replication, self-organisation and consciousness. [1] I draw from David Bohm's interpretation of quantum theory which encompasses in its scope a new theory about the nature of mind and matter. Bohm presented a holistic view of two interwoven orders of existence defined as the Explicate material world and the Implicate (quantum) enfolded world from which the former materialises.

The focus of this paper is to provide the groundwork and establish by way of inference to best explanation an adapted and adjunct conceptual schema in the form of a Triple-Aspect-Theory (TAT) of Being as a grounding ontology. Consistent with Bohm's idea that matter at a fundamental level consists of a kind of protointelligence, the TAT facilitates a perspective based on aspect conditions of the human organism intended to furnish an explanation of the constitutive mechanism (TAT) inherent in the evolving human being. The relationship between organisms and environment is largely responsive[2] particularly through the interaction of energetic processes whereby Nature's information coheres with protointelligence as mediated in the elements. The TAT, it is argued, operates as an organising principle by which it is further suggested evolution inherently proceeds and maintains itself in an interactive relation between the Implicate and Explicate orders. The accumulated effect of natural selection consists largely as adaptations, but without an organising principle it simply could not occur.

Drawing on Bohm's explanation of the interactive orders of existence an argument is made suggesting that the two orders, the Implicate and Explicate, and by extension, consciousness and cognitive processes, are only partially distinct overlapping in terms of the explicate (or expressed)

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[1] cf. Maturana, H.R. & Varela, F.J. 1980; Kauffman, S. 1986; and Chalmers, D. 1996).

[2] Typically described in terms of feed-forward/feedback systems and even DNA operates through circular feedback.

aspects of consciousness. A deficiency exists with the current metaphors describing human form (i.e. body and mind) and it is argued a broader perspective is achieved by employing the integrative and holistic terms of the TAT. At a very fundamental level 'consciousness' is regarded as amorphous and indistinguishable in the quantum vacuum.[1] When enacted dynamically consciousness has the capacity to transform into the more expressed aspects as witnessed in living organisms with specific reference to human experience and form here conceptually defined in terms of the TAT. The preliminary structural outline: Primary Consciousness - three orders (levels) of manifestation; Primary Body-of-Experience - the experiencing body having its own three discernible yet interwoven aspects; and Primary Intellect-Reflective - cognitive processes with a minimum of three crucial interwoven first-order capacities: 'memory', 'perception', and 'intelligence'. From these fundamental capacities arguably emerge the other recognizable cognitive faculties: reasoning, understanding, and imagination, etc. The term 'primary' is employed to indicate an overarching concept of engaged process for each of the three constitutive interwoven aspects of the Triple-Aspect-Theory.

Consciousness as it is formed in the TAT is taken primarily as an activity, for though we use the singular term for this natural kind of phenomenon, consciousness indeed displays distinct aspects e.g. particular (qualia) and universal (Nature). Putatively qualia stand as the identifying features of consciousness and the general approach to examining consciousness is to assume, based on a reductive analysis, it arises from some substratum whether neurological or architectural, etc.; and this approach, as recent history (e.g. identity theories) has shown, arguably is impoverished. Consciousness as a phenomenon manifests with at least three orders (or levels) of actualisation. In brief, the manner and uniqueness of my sensory conscious experiences, my qualia, are conditional upon my Body-of-Experience - inclusive of my physical experiencing body coupled with the body of my life-long accumulated phenomenally embodied experiences wherein I am engaged in life - and inclusive of my Intellect-Reflective constitution of engagement. This paper's argument supports the concept that consciousness has a neutral and universal aspect. This analysis has both metaphysical and epistemological implications.

A Process Philosophy

Philosophy has a long history of thinkers that fall under the classification of process philosophy dating back to Heraclitus. There are

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[1] cf. Sartre, J.P. in *Being and Nothingness,* (1943) provides a phenomenological perspective of consciousness as nothingness – indeed a kind of no-thing-ness (amorphous though active) from which freedom spontaneously emerges. Similarly see also Heidegger's "moment-of-vision" in *Being and Time* (1962).

several ways to understand 'process philosophy' and to encapsulate its central idea, the 'philosophy of process' resonates most strongly with the work of Alfred North Whitehead. Nicholas Rescher (2002) summarises its basic propositions:

> (1) That time and change are among the principal categories of metaphysical understanding; (2) That process is a principal category of ontological description; (3) That process is more fundamental, or … not less fundamental than things for the purposes of ontological theory; (4) That several if not all of the major elements of the ontological repertoire (God, nature-as-a whole, persons, material substances) are best understood in process linked terms; and (5) That contingency, emergence, novelty, and creativity are among the fundamental categories of metaphysical understanding (2002:5).

In order to examine and make sense of reality these summary propositions of process philosophy articulate a uniform methodological framework even if not a complete theory. The kind of process philosophy conceptually engaged and partially developed in this paper suggests there are at least four further integral concepts required to provide the necessary explanatory power sought as a practical philosophical model/system; that of 'conservation', 'extraction', 'transformation' and of 'binding-relations' - all essential for making sense of the composition of reality[1].

Bohm's Implicate and Explicate Orders

David Bohm's account of the Implicate and Explicate Orders parallels the quantum world and classical world of physics, respectively. Bohm's theory suggests that the whole Universe and everything in it enfolds or implicates everything else, which he likens to a giant flowing hologram or 'holomovement'. Underlying the apparently chaotic realm of physical appearances - the explicate world - there is a *within*, an inner or hidden implicate order. Important to note that the Implicate Order or quantum vacuum (*within*) exists all around us at every point in space and that means at every point of inhabited space occupied by phenomena, like you and me, there is a *within* or quantum vacuum. Imagine stretching your arm out away from your body into the enveloping space around you. At every spatial point along your arm co-exits the quantum vacuum in real space-time though *within* each point.

Bohm believed that total order is contained within this holomovement, in some implicit sense; analogously to a hologram film cut into pieces each retaining the original object. From Bohm's perspective, order, is contained in each region of space and time. Meaning that total order is contained within this holomovement (form) in such a manner that

[1] see Naimo 2011

"…under typical conditions of ordinary experience, there is a great deal of relative independence of things" (Bohm, 1990:273). As Bohm describes there is an 'enfoldment relationship' between the Implicate Order and Explicate Order (between the quantum and classical worlds) which is not passive instead having an 'active aspect' essential to the very nature of how and what each thing is. We are not separated by the quantum vacuum since it forms part of our being and is integral to nature. Each thing is essentially 'interdependently related to the whole', and therefore, to everything else (Bohm, 1990:273).

The implicate order is not static, that is the quantum realm is primarily dynamic in nature, in "a constant process of change and development" to which its most general form is the holomovement (1990:273). Consequently all phenomena arising in the unfolded, explicate order emerge from the holomovement in which "they are enfolded as potentialities and ultimately they fall back into it" (Bohm, 1990:273). The explicate order drawn from the holography perspective is a projection from higher dimensional levels of reality, i.e. from the inner order of the quantum realm to the external or classical order of the macro physical world. Individual entities composing the explicate order are generated and sustained by an ongoing process of 'enfoldment' and 'unfoldment', whereby subatomic particles are said to be constantly dissolving into the implicate order and then 're-crystallizing' providing stability. Bohm explains that the explicate order dominates ordinary experience as well as classical physics, thus it appears to stand by itself. The explicate order cannot be fully understood when abstracted from its ground in the primary reality of the implicate order (i.e. the quantum world) (Bohm, 1990).

Subatomic particles such as electrons Bohm describes as 'highly complex dynamic entities' not just simple, structure-less particles, whereas in the Copenhagen interpretation, the motion of particles is fundamentally ambiguous. Bohm's view is the antithesis of the Copenhagen interpretation. Arguably Bohm developed a more coherent interpretation according to which particles follow a precise path - one which is determined both by conventional physical forces and a more subtle force which he called the *quantum potential*. The quantum potential guides the motion of particles by providing "active information" with respect to the whole environment. The quantum potential pervades all space and provides direct connections between quantum systems linked by 'nonlocality', that is the ability for distant parts of the environment to affect the motion of the particle in a significant way. The word 'in-form' ('active information') is taken literally, i.e. 'to put into' (Bohm, 1990:278). The electron moves under its own energy. The quantum potential puts form into the electron's motion and the form of the electron's motion is related to the form of the wave from which the quantum potential is derived (1990:278).

For Bohm the mind is described as a:

> …constant flow of evanescent thoughts, feelings, desires, and impulses, which flow in and out of each other, and which, in a certain sense, enfold each other (as, for example, we may say that one thought is implicit in another, noting that this word literally means 'enfolded'). Or to put it differently, the general implicate process of ordering is common both to mind and to matter" (Bohm, 1990:273).

In the *The Phenomenon of Man* (1959) Teilhard De Chardin provides insight expressed through a similar triadic relation of processes.

> "Taken at its lowest point, primitive matter is something more than the particulate swarming so marvelously analysed by modern physics. Beneath this mechanical layer we must think of the 'biological' layer that is attenuated to the uttermost, but yet is absolutely necessary to explain the cosmos in succeeding ages. The *within, consciousness*, and then *spontaneity* – are three expressions of the same thing" (Chardin, 1959:62).

In a footnote Chardin qualifies the use of the term consciousness: "Here, and throughout this book, the term 'consciousness' is taken in its widest sense to indicate every kind of psychism, from the most rudimentary forms of interior perception imaginable to the human phenomenon of reflective thought" (Chardin, 1959:62). Chardin describes two energies, that of mind and that of matter as spreading respectively "through the two layers of the world (the *within* and the *without*) have, taken as a whole, much the same demeanour. They are constantly associated and in some way pass into each other. But it seems impossible to establish a simple correspondence between their curves" (1959:69-70). Now consider an apt interpretation of the account typically rendered in Big Bang cosmology. The universe began from a *within* and spread as the consequence of a singularity (big bang) to a *without* producing simultaneously spacetime as the expansion of the universe of matter. Further to this construal there is no doubt a conceptual correlation evident between the ideas of De Chardin's *within* and Bohm's implicate order and De Chardin's *without* and Bohm's explicate order.

From this elaboration it is evident that a common theme emerges in situating the parameters of investigation between the quantum and classical realms since indeed in reality they coexist. To make the connection and to spell out the Triple-Aspect-Theory and its significance attention turns to one constituent cognitive faculty, memory, as it most certainly plays a pivotal role in conscious life. I am using the term memory in its broadest sense. Memory is an important aspect of personal identity and plays an important role in the acquisition of skills and knowledge. That we remember past experiences and events *not now occurring* indicates that memory differs from perception. Perception nonetheless requires the activity of memory and understanding in order to make sense of what one perceives. The concept of memory however is

quite problematic in that as a term it is assigned to a variety of phenomena and internal processes in that there seems to be more than one type of memory. Fundamentally, however, memory is a reflective process. From a neurological perspective the brain areas implicated are the 'prefrontal cortex' (higher-order areas), 'the hippocampus' (left language; right spatial), the 'extra-pyramidal motor system' and 'cerebellum', the 'amygdala' (processing emotions) and the 'association areas of the neocortex' (Sutton 2010). This construal is by no means exhaustive I dare say since it considers only the neurological perspective of the concept of memory which simply may be incomplete.

Human memory putatively understood is divided into two categories - *functional* and *temporal*. Functional memory is described as *explicit memory* (declarative, includes semantic and episodic aspects) and *implicit memory* (non-declarative includes non-verbal motor skills). Temporal memory has three aspects *working memory* (immediate involvement); *Short-term memory* (important aspect required for learning) and; *Long-term memory* (most resilient over one's life time though can be modified by experience) (Sutton, J. 2010). Memory historically has been characterised as representing the mental or ideational side of our being such that when things come to mind, we recall that remembered, but we reasonably assume that memory has a physical underlying structure. Part of this account rests on the idea that memory is stored, coded such to be retrieved however widely distributed throughout the brain. Though in other ways we can talk about muscle memory, threshold memory, and behavioural memory; an example is one's ability to ride a bike and another to play the piano executing key strokes without watching which keys one is depressing (which also involves *spatial memory*). Add to this the sense that one's abilities are also dispositional, genetically coded, whilst recognising that behaviour is also learned yet without memory, in all its aspects or types, how could we learn, notwithstanding any organism having the capacity to act instinctively?

In addition, it is also important to consider that the concept of mind (putatively, the sum of all cognitive functions) is expressed metaphorically. Bruno Snell in *The Discovery of the Mind* (1982) observes that it is through the usage of metaphor that provides a means to even speak about the mind. We cannot speak about the mind without reference to metaphors which then consequently effect all other expressions we employ to outline the situation (Snell, 1982:vi). Metaphors such as 'mind' and 'consciousness', two very ambiguous concepts, interwoven no less with various cognitive ascribed notions involving cerebral faculties are themselves each difficult to define or indeed to separate into distinct or independent faculties. It is little wonder that the question concerning their substrate remains at issue.

The central thesis of the Triple-Aspect-Theory argues that the conscious human being, its body, replete with its interactive systems, is a sensory responsive, enactive process (senses and responds) embedded in the physical or expressed structure whereby the different integrated

systems (i.e. Digestive and Excretory systems; Respiratory and Circulatory systems; Skeletal, Nervous and Endocrine systems; etc.) supervene upon a basic or lower order (level) of intelligence (i.e. protointelligence) as an inherent capacity. Intelligence as a capacity arguably is a necessary condition for having basic instincts for even sensory recognition. Further, that the processes involved in the cognitive (mental/mind) are embodied as such expressing the psychophysical nature of the attendant faculties extending to the higher order capacities. I am using the concept of 'order' in the sense of 'levels' to capture stages of 'intrinsic change' resulting in the manifestation of attendant psychophysical capacities within the human organism (the interdependent systems and layers throughout). The contention is that underlying these two primary aspects is the base medium, which is indeed primary consciousness or first order consciousness. A useful metaphor to think about this idea is a 'coin' having two sides: heads and tails. The two sides project the face of each of the adjoining two sides, both sides however are of the 'one coin' which the two sides project. The two sides project but without the third grounding base which is the coin itself the sides would disappear. The coin metaphor though useful I admit is static and therefore an incomplete descriptor since consciousness (in the analogy: the coin body) is rather dynamic possessing different aspects manifested in its various activities (i.e. 'awareness', 'intuition', 'understanding', 'insight',etc.).

One overarching aspect of the TAT is named Body-of-Experience. Typically the human body is described as a multicellular organism. Cells we observe communicate with each other and the external world through a myriad of receptors located on its membrane. Specific cellular functions are determined by both the expression of these receptors and by the way they organise on the biological membrane in space-time. Significantly, however, little is currently known about this organisational process. To expand on this description through the combined aspects in process, Body-of-Experience captures not only the experiencing capacities that the body manifests through its integrated systems but also it operates as a metaphor whereby it captures much more that is indeed essential if the TAT is to serve as an investigative framework. In more concrete terms the human body is at once an experiencing organism, it lives through experiences, and in a way, life, is the expression, (Bohm's explicate order) of living experience.

The concept of 'experience' is itself a complex notion explained in various ways but my focus here is broadly defined as the activity of living engagement, in Heidegger's sense of 'Being-in-the-world' (*In-der-Welt-sein*) (1962:138-39). Heidegger conceptually extends upon Edmund Husserl's articulation of the unfolding of 'inner time' (i.e. 'protention', 'retention') developing instead an understanding of "human beings as a 'nexus' of lived experience ... he recognises the priority of the 'lived' world [*Lebenswelt*] ... its three temporal dimensions ... *ecstasies,* in which we, as temporal beings, exist all at once" (Ward, 2008:100). "Being is essentially temporal", in that "Being is always understood in

terms of time explained by its temporal structure" (Blattner, 2006:14). As such that the human body experiences is to say that it is engaged in the process of life, that it absorbs or imbibes those experiences of sensory and intellectual engagement in a myriad of ways. For example, describing the more mechanical functions such as eating and drinking - digesting - the body extracts necessary nutrients from what we eat and drink which includes respiration at a cellular level.

Body-of-Experience refers more broadly to the embodiment of the history of those lived experiences (cf. Heidegger's *facticity*) inclusively and as such it is a containment-field, an embodiment of experiences (memories, emotions, behavioural patterns and predisposed conditions, etc.). This description moves us beyond the integument, casing notion of embodiment. Furthermore the concept of Body-of-Experience as an integrated aspect of TAT captures the environmental elements that integrally contribute to the organism's constitution as a total entity. The human being constitutionally necessarily combines the genetic compositional material, the phenotype architecture, and importantly the culturally imbibed influencing material[1].

Building on this account to further develop the coexisting primary aspect, Intellect-Reflective, of the TAT, by way of a working model of the cognitive system drawn from Maturana, H.R. and Varela, F.J. (1980) based on the notion of autopoiesis as a principle of self-organisation. Even as far back as Aristotle, in *The Nicomachean Ethics* Book VI, he first described the 'Intellect', as having at least two fundamental aspects to its process – the 'contemplative' and the 'calculative' (Aristotle, 1980). Similarly Intellect-Reflective is a compound or unifying concept for the mind and its associated faculties. Distinctively, the faculties typically, though arguably errantly, demarcated as cerebral individuated concepts such as 'reason', 'understanding', and 'imagination', are faculties demonstrably overlapping and integrated, that are perhaps best referred to as second-order processes because they are not independent faculties. Conceptually then, the three most fundamental capacities are 'memory', 'perception' and 'intellect' which it must be observed, are also interdependent. Without these fundamental capacities ('memory', 'perception' and 'intellect') the ensuing second-order faculties of *reason*, *understanding* and *imagination* would be rendered devoid of ideational substance. Since what stands for the second-order faculty of *reason* emerges from the activity of engaging the combined capacities of 'memory', 'intellect', and 'perception'. Again what stands for the second-order faculty of *understanding* is the activity of engaging the combined capacities of 'memory', 'perception' and 'intellect'. Furthermore what also stands for second-order faculty of *imagination* is the activity engaging the combined capacities of 'memory', 'intellect' and 'perception'. This composition is conceptual providing the basis for

[1] Material in the multiple senses of consumables: food and beverage and the environment relative to one's compositional Space-Time-Event-Motion (STEM) material and 'place' (cf. Heidegger's *Historicity*) that one develops within which sensibly includes the environmental conditions.

advancing the primary co-conditions required to establish the appropriate grounding for the biophysical organising principle.

Having now outlined this aspect of the TAT - Intellect-Reflective – our attention shifts to examining the somewhat commensurate concept of autopoiesis which is said to gravitate around a matrix of concepts of 'unity', 'organisation' and 'structure'. The most salient cognitive operation as observers, according to Maturana and Varela is the operation of 'distinction'. The assumption that a living system can be accounted for by enumerating its properties they say is flawed because it can only be understood as a *unity*. The authors' explanation suggests that what we encounter in the world is autonomous entities of immense diversity endowed with a capacity to reproduce. How do we qualify what is living and is common to all living systems? If not the idea of a vital force, or Aquinas' soul, then, we should be looking for an organising principle arguably along the lines of the TAT.

Maturana and Varela's approach, however, it should be noted is entirely mechanistic and human beings are construed as closed dynamic cognitive systems. Though cognitive systems have in the past been characterised as closed systems, Steven Rose (1997) among many thinkers rightly argues this view is incorrect and that living organisms are indeed open systems that share a reciprocal relationship with the environment. Rose argues that physiological mechanisms are situated within the homeostatic metaphor such that the 'internal environment' of multicellular organisms describes their tendency to function to regulate this environment in terms of temperature, acidity, ionic composition, etc. This tendency is functionally described as one where the organism works to a fixed point analogous to how a central heating system's thermostat regulates the temperature in a room. Organisms, like ecosystems, as Rose describes, throughout their developmental *Lifelines* are indeed subject to change so the set points of the homeostatic model are not themselves constant. Organisms, on this account, are active players in their own fate and to understand 'lifelines' Rose believes requires a new metaphor to replace homeostasis with a much richer concept he calls *Homeodynamics* (Rose, 1997:17). A unity in this sense consistently forms part of the interactive environment and never just an abstraction. Rose observes that evolution indicates that the internal environment of living organisms develops symmetrically with the external environment.

Regarding the human species then as self-organising systems presupposes that there is an intrinsic organising principle that underlies the development of the organism. Consider the Autonomic Nervous System (ANS) which functions without conscious, voluntary control. The ANS has two main divisions: the sympathetic and the parasympathetic. Upon receiving information about the body's internal and external environment the autonomic nervous system "responds by stimulating body processes, usually through the sympathetic division, or inhibiting them, usually through the parasympathetic division" noting the two subdivisions can function in opposite activities (Low, P. 2006). The ANS influences the activity of most tissues and organ systems in the body. As

such, the ANS makes a significant contribution to homeodynamics. Our awareness however is characterised as a conscious aspect, yet the unconscious aspect of the ANS is a vital aspect of the body's animated ongoing life sustaining process. The unconscious arguably is still an aspect of conscious activity, pointing to a second order of manifestation. It is unconscious in that it is not in the order of consciousness awareness though conscious through the attunement of regulatory functioning. As such conscious awareness, it is argued, is indeed a third order of manifestation. This third order of conscious awareness, though not exclusively as earlier suggested due to overlapping cerebral processes, manifests concurrently in the overarching aspects I refer to as Intellect-Reflective and Primary Consciousness within Body-of-Experience. In other words a self-organising system self-organises under the influence of an inherent organising principle i.e. TAT.

Ordinarily construed, all species of living organisms have at least two forms of intelligence operating through reciprocal existence. That is, firstly, to recognise and make use for its own maintenance from the environment i.e. consumables, and secondly, in the act of perception identifies difference (very crucial for development, recognition of 'others'). In the case of humans that we are social creatures, reminding ourselves of Wittgenstein's 'no private language' idea, we extend intellectually beyond the animal kingdom. Organisms that cannot reciprocate with their environment will perish rapidly. Organisms that perish revert to that upon which they are dependent (i.e. the environment). Underlying the process there is a level of reciprocal intelligence and this is the primary level of consciousness.

Concluding remarks, life identifies life - consciousness recognises consciousness. Consciousness at this level is primary - it is more than an emergent property of a single entity. Primary consciousness I am claiming parallels Bohm's quantum potential that acts to put form into the system; the form is itself the Body-of-Experience and the directive capacity of the system is its Intellect-Reflective in combination a triple-aspect constitution. Consciousness, therefore, cannot be particular and so there must be a universal aspect that is perhaps neutral and only becomes particularised when in engaged or activated form emerging from the Implicate Order. Consciousness in this sense underlies the evolutionary activity of the extended Universe as I hope the argument advanced demonstrates. Reiterating that for Bohm the quantum potential acts to put 'form' into the motion of particles like electrons and the form of its motion is related to the form of the wave, equally valid for biological systems like human beings.

References

- Aristotle. (1980) *The Nicomachean Ethics*, (trans. Ross, D. Revised by Ackrill, J.L. and Urmson, J.O.) Oxford World Classics, Oxford University Press, New York.
- Blattner, W. (2006) *Heidegger's Being and Time,* Continuum International Group, New York.
- Bohm, D. (1990) *A new theory of the relationship of mind and matter*, Philosophical Psychology, 3, (2): 271-286
- Bohm, D. & Peat, D.F. (1989) *Science, Order & Creativity, Routledge*, London
- Chalmers, D.J. (1996) *The Conscious Mind: In search of a fundamental theory*, Oxford University Press, New York.
- De Chardin, T. (1959) *The Phenomenon of Man*, William Collins Sons & Co. Ltd, Glasgow.
- Gribbin, J. (1998) *Q is for Quantum: particle physics from A to Z*, Weidenfeld & Nicolson, London.
- Heidegger, M. (1962) *Being and Time*, Harper Collins Publishers, New York.
- Kauffman, S. (1986) *The Origins of Order: Self-Organisation and Selection in Evolution*, Oxford University Press, USA.
- Low, P. (2006) *The Merck Manual Online Medical Library*, Available @ http://www.merckmanuals.com/home/sec06/ch098666/ch098666a.html
- Maturana, H.R. & Varela, F.J. (1980) *Autopoiesis and Cognition: The realization of the living*, D. Reidal Publishing Company, Holland.
- Naimo, J. (2011) 'Ontology that Matters: Binding relations' in *An Anthology of Philosophical Studies, Vol. V*, the proceedings for the 5th International Philosophy Conference in Athens.
- Reichmann, J.B (*S.J.)* (1985) *Philosophy of the Human Person*, Loyola Press, Chicago.
- Rescher, N. (2002) Process Philosophy in *Stanford Encyclopedia of Philosophy,* Available Online @ http://plato.stanford.edu/entries/process-philosophy/ Accessed February 16, 2011
- Rose, S. (1997) *Lifelines: Biology, freedom, determinism*, Penguin Books, London
- Sartre, J.P. (1943) *Being and Nothingness: An essay on phenomenological ontology*, (trans. Barnes, H.E.) Philosophical Library, New York.
- Snell, B. (1982) *The Discovery of the Mind: In Greek Philosophy and Literature*, Dover Publications, Inc. New York.
- Sutton, J. (2010) 'Memory', in *Stanford Encyclopedia of Philosophy*, Available Online @ http://plato.stanford.edu/entries/memory/ Accessed January 4, 2010
- Varela, F., Thompson, E.T., and Rosch, E. (1993) *The Embodied*

Mind: Cognitive science and human experience, MIT Press, Massachusetts

- Ward, K. (2008) *Augenblick: The Concept of the 'Decisive Moment' in the 19th- and 20th- Century Western Philosophy*, Ashgate, England.