

2009

## The Primacy of Consciousness: A Triple Aspect Ontology

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### Recommended Citation

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## ACKNOWLEDGMENTS

I here acknowledge all the people who in some way have contributed to this project with their support, advice and encouragement. First, to my colleagues in TP3 whose company, good humour, and friendship were a joyful reminder that a dose of lunacy at least once a day is equally as important as a staple diet! I extend my thanks to Professor Horst Ruthrof and Dr. Peta Bowden for their belief and for their encouragement to take on this research project. I am especially indebted to Dr. Paul McDonald who during the last twelve months of this project provided insightful comment on each chapter draft. Dr. McDonald's expert philosophical input and critical analysis has helped shape this work. I am thankful for his candor and open-mindedness to embrace the broad range of topics and issues drawn from an equally broad range of disciplines necessary to complete this project. In particular I wish to thank Stuart Hameroff for his insightful reading and practical recommendations at the dissertation stage. To F. David Peat I thank for his expert reading and confirmation of my interpretation of David Bohm's ideas. To Dr. Michael Booth I extend my heartfelt thanks for his support throughout this journey. Dr. Booth's insight and substantive support and practical suggestions lead to a number of research areas and issues covered in this project. I am very thankful for his editing advice and grammatical recommendations and for his friendship. I extend my thanks to Andris Stelbovics, Professor of Physics at Murdoch University, for his expertise, guidance, and especially for taking the time to clarify many of the ideas advanced in Chapter Seven.

I owe a special thanks to my partner Elaine for her tireless support, critical eye, clarity of mind, and pragmatism. To the post-grads of the unofficial Murdoch Cog. Sci. group, I thank all who attended and contributed to the discussion sessions over the last three years of the project. Of those in particular, I acknowledge Grant Wignall and Elizabeth McCardell, two very lucid thinkers to whom I owe a debt of gratitude for their friendship, thought provoking philosophical debates and discussions. Special thanks to Linnie Mahboub for her valuable assistance in producing the computer generated illustrations.

# Introduction

Consciousness – What is it? How does it arise? These are perhaps the two most perplexing questions on the minds of researchers extending across a broad spectrum of disciplinary enquiry. Consider the interested disciplines of cognitive science notably psychology, philosophy, linguistics, quantum mechanics, artificial intelligence and the neurosciences. Cognitive science is the study of intelligence and intelligent systems. Cognitive science attempts to organize and unify views of thought as developed within these distinct disciplines (Sheedy & Chapman, 1995:ix). The concept of consciousness is in one sense readily recognized, putatively held to be that which makes humans different from the rest of the animal kingdom. Consciousness is thought to be what makes us what we are, that enables us to feel and sense things - those attributes of phenomenal experience collectively termed qualia. The concept of qualia derive their meaning from the sensory qualities representative of human phenomenal experience at least on the one hand from non-materialist perspectives, due to this thing called consciousness. The sense of pain, for instance, is a quale thought to be a property of consciousness. Although, on the other hand from a purely reductive materialist perspective, in what sense can the neurochemical activity equally be responsible for producing pain in the body? In other words, how does consciousness arise from a network of interconnected neurons and glial cells of the brain? This sort of question leads one to wonder whether every individual neuron is conscious. If not, what then, is the critical threshold of neurochemical activity for consciousness to arise? No one has a definitive answer or one even close enough to make sense out of the question.

The study of consciousness requires that we understand what feature/s or qualities make consciousness different from cognitive functions of the brain. That is of course if they are different entities requiring two different metaphors to describe them. In that case, perhaps the mind and consciousness indeed are two aspects embodied in a third physical aspect of experience, hence a triple-aspect construal of matter. A pertinent question is to ask just how or in what sense consciousness differs from other cognitive faculties. Cognitive faculties

are those concerned with ‘sense-perception’, ‘reason’, ‘logic’, most specifically with ‘intelligence’, the properties most associated with the mind which is said to be strictly associated with the brain. But, then again, what role does the rest of the body play in the emergence of mind if sensory perception is to be attributed to the mind and or consciousness? In cognitive science the concept of an architecture is indeed quite central to understanding the organization of intelligent action. The fundamental design specifications of an information-processing system are called its architecture. In other words, an architecture is an information-processing mechanism that can operate on data presented in the appropriate form. Therefore an architecture of “cognition attempts to locate the source of intelligence in the properties of the underlying information-processing engine” (Sheedy & Chapman, 1995:xiii).

The sense of feeling, of bodily sensation *per se*, derives its epistemic sense for some thinkers, especially those that ascribe conscious qualities as situated beyond the material substrate of the brain, ‘out there’, and ‘external’ to us that we somehow tap into. This is of course a snap shot retrospective view of the many philosophical arguments that have historically emerged between idealists and materialists. In a very crude sense the idealist conceive of the Universe as being all mind and the materialists conceive mind as merely emerging from the material substrate of the brain.

Historically the concept, and in particular, the study of consciousness, at least since the time of Descartes, has been approached through various methodologies and from differing worldviews. Such views form the basis of typically monistic, dualistic and triadic conceptions of Nature and its phenomena. Still, the Aristotelian substance based ontology that has dominated orthodox approaches to the study of mind and/or consciousness nonetheless leaves a discernible residue of organically viable structures and concepts veiled by a superficial theoretical scheme. In recent times many diverse thinkers such as Heidegger, Whitehead and Bohm have questioned the very foundational concepts attributed to Aristotle as perhaps inadvertently, ‘concealing’ a realm of living, inert properties of Nature. Properties that were indeed manifest to the pre-Socratic thinkers. In particular, thinkers such as Heraclitus and Empedocles

both of whom conveyed an idea of an underlying richness from which elementary life goes all the way down. Extrapolating upon what these thinkers conceived forms one of the central themes of this dissertation. This central theme at its core embodies a holistic view of Nature and provides a two-fold way in which to understand it. Firstly, by identifying its properties in the diffuse elements based on an inherent triadic mechanism as the universal principle by which to explain what Nature is and to understand how it works. Secondly, these inherent properties encapsulate the method from which to approach our study of consciousness.

In undertaking the study of mind and/or consciousness, it is useful to consider the less controversial question of how we study a complex system such as the human body. We assume that the species is characterized by a certain biological endowment. That is, the embryo develops as its genetic program unfolds, mostly under the triggering and controlled effect of the external environment. The organism does not learn how to grow limbs or reach puberty. Rather, the general course of development through to maturation is genetically determined, though the realization of the genetic plan depends largely on external factors. The result is a system of interacting organs – the respiratory system, nervous system, digestive system, visual system, etc. – each with its structure and functions, interacting largely in predetermined ways. The idea of determination lends itself to the concept of an ordering mind or intelligence. Put rather crudely evolutionary biologists call the ordering of Nature, Natural Selection; physicists call it Laws of Nature, theologians call it God. It stands to reason that if intelligent life could have emerged biologically from seemingly inorganic material then, for one, our understanding of inorganic material and intelligence is insufficient. And two, intelligence may well be a property of Nature capable of various degrees of manifestation other than the cerebrally embodied familiar form, capable of differing morphologies.

The concept of mind is expressed metaphorically. Bruno Snell in *The Discovery of the Mind* (1982) draws attention to the fact that it is through the usage of metaphor that we can 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 concepts concerning cerebral faculties are themselves each difficult to define. Largely, this is because they refer to self-referential systems, the very epistemic acquisitional tools enabling humans to understand the world and its phenomena. It is little wonder that the question concerning their substrate remains at issue. The metaphors used to describe these faculties are ‘reason’, ‘will’, ‘intellect’, etc. as well as ‘sensory perception’, connoting the embodied gateway to the external world. Philosophers since Descartes, have historically used the term ‘consciousness’ as the subject of analysis to cover several areas of intellectual concern, for instance, *epistemology*, *intentionality*, *introspection* and *phenomenal experience* (Lormand 1998:581). The terms ‘mind’ and ‘consciousness’ when employed across disciplinary forms of intellectual enquiry have come to mean different things to different researchers, theorists and technicians alike. My concern is to unravel the conflated terms ‘mind’ and ‘consciousness’ and to situate each concept according to the domain of physical activity each emerges from and should be consequently employed to describe.

To do this requires an analysis of the cognitive faculties and what is putatively held to be conscious experience. First we must address the notion of what is to be defined and examine the tools at our disposal and the methodologies from which these tools are employed. In the scheme of things to be addressed it is crucial to our analysis that the most significant linguistic device – metaphor, be evaluated and set skeletally to frame and connect our concepts. My task is then to review the concepts we are dealing with and present a synoptic view without rewriting the history of how we have arrived at the understanding we have of them. This will entail a retrospective analysis of how the concepts of mind and consciousness emerged over time and some of the sorts of criticisms and experimental evidence that have shaped the senses we have of them. This will allow us to review the problems associated with developing a concrete theory of consciousness. One salient point throughout the analysis is that strictly unitary or binary theories help to explain phenomena; however they are not complete in themselves.

What consciousness stands for will form the basis of this research as a principal thesis demonstrating that it bears little resemblance to the sensory-like expressions and description of it as provided by qualia terms. Consciousness, it is argued, is much more like a source upon which all the matter of the Universe has drawn upon for its actualization. Consciousness does not emerge or more specifically supervene upon an existent material substrate of the Universe. Rather, the material Universe supervenes on consciousness from which it actualizes. Supporting this view entails an analysis of our most current models that inform and provide an understanding of matter. Some important aspects regarding the history of research conducted into consciousness studies (formally the mind/body problem), is here synthesized from a broad range of disciplinary inquiry and interpreted to this logical conclusion. This leads to the development and introduction of a modified holistic metaphysical worldview formed, in part, with a triadic based schema in which consciousness is posited as the first of three universal conditions. The triadic conditions form a descriptive universal principle of Nature within an attendant process-philosophy. The modified metaphysical worldview emerges from the development and incorporation of several conceptual models, the first of which is termed the Triangulate-Three Principle, which suggests that consciousness and matter are mutually inclusive concepts.

The advent of quantum theory brought with it certain ideas concerning the very fabric of the Universe that requires a radical shift in the way we think about how Nature is constructed. Other seemingly disparate metaphors point to what physicists' call the 'fundamentals' of Nature such as 'charge', 'mass', 'energy', etc., which are indeed equally important to our overall analysis. The penultimate concept and most important metaphor, to which the phenomenon it denotes requires a proper understanding if we are to advance on establishing a theory of consciousness, is 'energy'. One of the underlying assumptions of this project suggests that these two concepts, 'energy' and 'consciousness' are inextricably intertwined. The modified holistic worldview suggests that every spacetime point of consciousness is connected to every other spacetime point in the Universe via two overlapping orders of existence, that is, a primary order

(potential) and a secondary order (actual). This model is an adaptation drawn from David Bohm's Implicate order and Explicate order. Indeed the worldview presented here owes much to Bohm's insight and interpretation of quantum theory and what emerges is largely the result of an attempt to provide possible explanatory inroads to some outstanding questions Bohm had sought to answer. The adapted orders are here termed the Expression order which consists of the actualized Universe as the secondary order of existence. The primary order is termed the Impression order and remains a constant source of neutrality perhaps conveyed in the Leibnizian sense of *potentiality*<sup>1</sup>, indeed, completeness and time-independent. In developing the concept of the Expression order a new conceptual apparatus is posited from the combination of four relative concepts regarding the physical geometry of the Universe and in part to contextualize the concept of energy. The four-relativized concepts are Space-Time-Event-Motion (STEM) the terms whose acronym forms a new concept with dual aspects. Firstly, STEM encapsulates the physical processes as Expressed in Nature and secondly, it retains its intransitive verb form which by definition has no object yet refers to processes such that points or leads to and from observed events. The idea of non-locality ushered in a need to evolve our way of thinking away from the strictly linear conception of causality (cause/effect) to a nonlinear open view to accommodate a broader range of possibilities.

Incoherent as this may seem it simply parallels a vast array of mystical sages' profundities referring to some ineffable nature underlying the Universe. Yet, it is conceivable to present a model and argument that makes the ineffable conceptually and demonstrably tangible as brought to light by quantum experiments confirming the quantum vacuum. My concluding chapters will in effect be a synthesis of the information and findings presented in the preceding chapters that will form the modified holistic worldview based on the Triangulate-Three Principle and the integrated concepts within an attendant

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<sup>1</sup> Spinoza interpreted God as the infinite actuality whereas Leibniz held that God must also consist of *infinite potentiality* for any "rational soul its substance must consist of its potentiality as much as its actuality" (Carr, 1960:39). For Leibniz the reality of a living being is *force or potentiality*.

process-philosophy. Thus conceptually linking the classical and quantum worlds together and recasting the ideas of consciousness, energy, and Nature.

In Chapter One I directly draw from the compositional breakdown offered by Julian Jaynes (1976) regarding the linguistic device, metaphor. It has been made evidently clear in recent times that reductive methodologies suffer insurmountable problems in some areas of investigation. In particular, regarding its usefulness as a methodological tool used in the study of consciousness. When reductionism, however, as will be demonstrated is employed as a theoretical apparatus oriented within a holistic framework dealing with system processes rather system parts a new understanding emerges. After having set our tools in order my task is to delve into the past and review certain significant works within the literature of philosophy of mind and explore recent findings concerning the development of the concept of consciousness. Modern day notions of consciousness directly, however infamously, link to Descartes. What has become known as the Legend of Cartesian Dualism, 'a myth about a myth' as Baker and Morris (1996) call it in their work of critical acclaim rewrites the history of poor and errant interpretations of Descartes work. Descartes work cast doubts on the Anglo American interpretations and consequently the history of concepts attributed to Descartes.

The purpose of dealing with Descartes is not so much one of vindication from the Legacy for dualist approaches for most part whether attributed to Descartes or others nonetheless form a divisive conception of a unified Universe. An obvious consequence is one where analysts are invariably constrained by compartmentalized worldviews ultimately hindering advances upon the study of consciousness. That does not mean that dualist approaches cannot shed light on an otherwise intractable problem. On the contrary, the importance of thinkers like Descartes and later Kant rests on their dichotomized worldviews, if only implicitly recasting the Platonic realm of Ideas in new light relative to their own respective intellectual schemes. Remolding ideas of the past to reflect an evolved understanding as realized and continually extended by evolving technologies and methods of exploration indeed reflects the advance of human intelligence. Extrapolating from what is implicitly, and modifying what is

explicitly stated in the works of Descartes and Kant forms a great part of the subject material found in the literature of philosophy of mind. Part of the process of analyzing the concepts of mind and consciousness, will involve a brief excursion into the paths of exploration to review how the concepts post-Descartes have been treated. This specifically entails focusing on a select few prominent theorists whose own work led to the establishment of schools of thought; hence, briefly reviewing their strengths and weaknesses which consequently ushered in the rise of competing schools of thought. One critical obstruction in the path of any physicalist account into the nature of the mind and body problem refers to Thomas Nagel's 'what it is like to be' argument. The argument is most damaging to reductive accounts of mentality because of an exclusive impersonal standpoint which inevitably fail to explain the irreducible subjective character of consciousness.

Continuing this analysis Chapter Two explores the central arguments of twentieth century theorists commencing with Frank Jackson's (1982) 'Knowledge argument' amplifying Nagel's argument by affirming doubts raised against physicalists accounts of the mind and body problem. According to Jackson, no amount of physical information will fully include an explanation concerning certain bodily sensation like pain and certain perceptual experiences. This is followed by physicalists rebuttals to Nagel and Jackson namely Janet Levin and Laurence Nemirow. Levin argues that both Jackson's and Nagel's arguments are flawed because they depend on equivocation. Nemirow explores three philosophical errors both protagonists he suggests commit based on conflating different types of knowledge, in particular treating 'ability' as propositional knowledge.

This leads into two opposing views of the debate concerning the merit of folk psychology; one quite damning drawn from Paul Churchland (1981), the other drawn from its strongest advocate Jerry Fodor (1986). Folk psychology can be described as a putative network of principles that constitute a commonsense theory believed to underlie explanations of human behaviour. Mental states such as 'belief', 'intention' and 'desire' are assigned a central role in this theory. Churchland, a self-declared eliminativist who has most lucidly made criticism

against the theory believes propositional attitudes will be made redundant by completed neuroscience. Churchland claims that knowledge of other minds does not necessarily depend upon knowledge of one's own mind and raises doubts about the subjectivity of the *intentionality of mental states*. The systematic core of folk psychology amounts to "propositional attitudes" in which the intentionality of mental states, Churchland argues is not such a mysterious thing but rests on a structural feature of its concepts. Jerry Fodor endeavours to reinstate the importance of propositional attitudes and commonsense psychological theory. Fodor takes the defensive stance and argues that our language and ability to communicate and to make predictions concerning the behaviour of others as "intentional systems" would otherwise be impossible.

In light of this debate an important consideration brings into account Kripke's essentialist objections to physicalism and the now established criteria for an adequate account of the nature of 'being' as drawn from Richard Boyd (1980). Although, as will be demonstrated Boyd's defense falls short of overcoming Kripke's objections. Colin McGinn (1977) however, cogently develops an argument that appears to overcome Kripke's objection in reply to the Kripkean criteria. McGinn's argument demonstrates that token-token identity theory survives Kripke's necessity identity conditions. To conclude the chapter an assessment and summary indicates that physicalist approaches are indeed incomplete. Arguments for and against physicalism are in many ways reducible to semantical problems concerning identity criteria. An important salient point concerns the basic distinction between 'information about knowledge' and 'knowledge' in the experiential or holistic sense of the word. In consideration of an alternative approach, namely dualism the idea that the mind can somehow inhabit an extended body renders its location as extended. It follows that the mind is indeed part of the physical in a very special yet unclear way. Furthermore, it appears that consciousness represents more than just mental phenomenon and forms an intrinsic element of the physical world.

Chapter Three puts forward an analysis of the most prominent school of thought lauded as most likely to succeed in providing an explanation of consciousness – computational emergence. One problem at the outset is that computational

emergence theory is heavily reliant upon the neuron doctrine, which many thinkers believe is an outdated model of neural circuitry. The objective here is to analyze the inherent problems encountered with computational emergence and evaluate to what extent its strengths, nonetheless, advance our understanding of consciousness. To this end, a defense of computational emergence is drawn from Alwyn Scott (1995) who cogently argues that classical physics alone will overcome the problem of consciousness. Similarly, three influential experiments are discussed with reference to the subsequent findings and corresponding implications relative to the experimenters' conclusions and speculations regarding approaches to consciousness studies.

Alternative approaches emerging from quantum theoretical interpretations and subsequent experiments bring to light certain fundamental assumptions about the nature of matter and mind. Here an overview of the radical Copenhagen interpretation of quantum theory outlines the implications regarding the structure of matter and the advances and prominence of the work in this field and its consequences for the study of consciousness. Certain enigmatic features are entailed in its formalism which require analytical attention in order to make sense of the inherent problems of this orthodox account. The Copenhagen interpretation has many adversaries one to which attention in this chapter is particularly drawn is David Bohm. Bohm's interpretation of quantum theory encompasses in its scope a new theory of mind and matter. Certain features as described in Bohm's interpretation provide new avenues for conceptual development within consciousness studies. Bohm presents a holistic view of two interwoven orders of existence defined as the Explicate material world and the Implicate enfolded world from which the former materializes. The relevance for consciousness studies is immediately made evident through an elaboration upon Bohm's interpretation of quantum theory and his account of the *quantum potential* and his theory of *active information*. Many of these features are adapted to advance my own conceptual scheme and ontological framework, which could not have reached the conceptual development were it not for Bohm's theory which crystallized my own thoughts on the matter.

This is contrasted with an overview of Roger Penrose and Stuart Hameroff's ORCH OR model given the significance of the notion of quantum gravity as espoused by Penrose in explaining not only consciousness but also a completed physical theory. Penrose concludes that we have yet to reach a level of theoretical development, and he suggests that our current theories are incomplete. Penrose holds the view that the quantum collapse of the universal wavefunction that brought forth the materialized Universe is directly attributed to quantum gravity yet to be theoretically formalized. The overall aim of Chapter Three is to lay the foundations in which to develop a syncretized approach to understanding consciousness.

Partly, then, in Chapter Four the focus is shifted from the hitherto Western perspective to bring together ideas that emerge from a fascinating Eastern perspective. The first part of the chapter presents an overview of Buddhist philosophy with specific emphasis given to the Buddhist *Skandha Theory*, a fundamental theory of the psychophysical personality first promulgated by its founder Guatama Buddha. The term *Skandha* when translated into English means aggregate. *Skandha* theory explains the human being as a psychophysical personality characterized as comprising five aggregates or *skandhas*. The relevant ideas in question, however, emerge from the second century Yogacara Buddhist school of thought in particular those ascribed to the preeminent principal teacher Vasubandhu who developed a theory of consciousness with eight characteristic aspects. Vasubandhu's prescient notion of 'energy-moment-events' in a manner preempts Whitehead's process philosophy. From the eight-fold formulation of consciousness, the eighth type called *Alayavijnana* commonly translated as the "seed-storehouse" consciousness has the most far-reaching implications. The *alayavijnana* forms an underlying consciousness from which all other consciousness types in a consciousness-series (i.e. human being) are influenced. The world according to this perspective as given through the eyes of an *aggregate-series* as it is situated within the Wheel of Life is reified and is perpetuated via dispositional *cravings* and *grasping*. Vasubandhu's perspective is in many ways a reduction of the concepts amalgamated to produce the world and its inhabitants as separate entities. From this standpoint there is no underlying source such as the spirit or soul (i.e. *atman*

*theory*). There is only the ineffable – Nirvana. No constructs or concepts can describe it because to be so defined is to draw sense from a constructed source. The parallels that can be drawn between Vasubandhu's analysis of consciousness with the implications emerging from the quantum views of Bohm, Penrose and other contributors to the field are quite promising for forming a syncretic perspective. These parallels are made explicit in the preliminary analysis and summary sections of the chapter in conjunction with the introduction of a linking conceptual apparatus called Signature-Energy-Frequency (SEF) based on Planck's constant. Furthermore, the significance of this conceptual device and its relation to 'action' will become apparent in the second section.

In the second section of the chapter the focus is slightly shifted to bring into account several corresponding biological considerations. A working model of the cognitive system is directly drawn from Varela, F.J. and Maturana, H.R. (1980) based on the notion of autopoiesis as a principle of self-organization. The concept of autopoiesis gravitates around a matrix of concepts such as 'unity', 'organization' and 'structure'. The most salient cognitive operation as observers, according to Varela and Maturana 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*. 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 then we should be looking for an organizing principle. Varela and Maturana's approach is entirely mechanistic and human beings, however, construed as closed dynamic cognitive systems. Though cognitive systems are often characterized as closed systems Steven Rose (1997) among many thinkers argues it is simply not the case and that living organisms are indeed open systems that share a reciprocal relationship with the environment. Rose suggests that physiological mechanisms are in the main situated within the homeostatic metaphor so 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 one where the organism works to some fixed

point in the same way a central heating system's thermostat regulates the temperature in a room. Organisms like ecosystems throughout their developmental *Lifelines* are indeed subject to change so the set points of the homeostatic model are not themselves constant. Organisms 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*. A unity in this sense consistently forms part of the interactive environment and never just an abstraction.

Many thinkers indeed believe that the objective world and the subjective world of perception form a united synergetic system. Explaining how this is achieved by Nature still requires further details over and above the arguably incomplete mechanism of Natural Selection commonly described as the main driving process of evolution. What is lacking is an explanation that fully describes an appropriate mechanism behind the driving process; one preceding 'random variation' that also describes how it is indeed constituted. The journey towards establishing this mechanism and the processes involved requires bringing together certain bridging concepts and making explicit what is implicit in the fundamentals of Nature. Largely this task is already achieved as put forward by Edgar Mitchell (1999) who cogently brings together four major ideas in which to explain how the dynamism between the objective and subjective realms of experience co-evolve and co-operate. The four ideas refer to 1) a generalized theory of information; 2) quantum science itself with the associated phenomena of non-locality; 3) the zero-point energy field and; 4) the quantum hologram. Although these associated phenomena are not in themselves entirely understood, they are acceptably validated by theory and experiment for postulating a necessary condition for the existence of consciousness. Mitchell points out that information theories although quite useful in their application, for example, in the fields of physics, artificial intelligence and communication technologies, are nonetheless insufficient outside their specific domains. This is no where more evident than when considering the problem of consciousness and its evolution together with its attendant phenomena.

The relevance of information in physical theory is important because it provides the basis for how cognitive systems perceive reality. The concept of information

should encompass a broader range of constituent elements to reflect our increased understanding of the world of phenomena due to greater advances, largely, in the fields of physics and the biological sciences. The concept of information broadly defined as ‘patterns of energy’ provides an appropriate *Gestell* relative to all physical processes, hence congruence between physical and psychological laws. Mitchell draws from the work of Peter Marcer and Walter Schempp who in 1997 proposed that for an object to be perceived in three-dimensional space would require a necessary condition, namely a Phase-Conjugate-Adaptive-Resonance (PCAR). As Mitchell explains resonance requires a virtual path, mathematically equal yet opposite to incoming sensory information about the object (1999:3). In this sense, the PCAR condition becomes a plausible co-evolutionary mechanism. Three-dimensional coding of colour spaces for example suggests that the “information state in a colour experience corresponds directly to an information state in the brain” (Chalmers, 2002:100).

Although, with human beings, however, information does not have to be coded in the same way it is received<sup>2</sup>, evidently then, some desideratum still requires explanation in relation to the self-organizing processes of living organisms. Regarding information in terms of patterns of energy suggests that the desideratum should naturally cohere with energy and as such SEF is here reintroduced as an adjunct to the PCAR condition, as a congruent mediating internal mechanism. Sensory modalities reduce to their constituent molecular substrata, each of which empirically corresponds to a particular frequency spectrum for its kind. Energy-events, in terms of psychophysical activity will have a corresponding overall ‘signature’ brought about from attendant internal mechanisms commensurate to the experience and subsystems thereof, hence SEF. That is, the semi-independent subsystems for example of the human body no doubt manifest an overall SEF as distinguished from background “noise”. The internal world of thoughts and experience do not necessarily parallel the

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<sup>2</sup> The standard model of working memory suggests that phonological information can be coded and stored in either a direct fashion “through auditory presentation of verbal material, or ... indirectly either through subvocal articulation or via phonological stored in long-term memory” (Eysenck, 1990:373).

external environment. One can be attending to one thing, for example, driving a car, whilst at the same time be doing (e.g. lighting a cigarette or drinking from a container) something else. This capacity is associated with one's life experiences and learnt behaviour and so an explanation of the physiological processes and biological structures must reflect this inherent ability of creative and directive animation along with the organism's associated degrees-of-freedom. Mitchell's own hypothesis states that if non-locality is operating at all levels of activity then resonances involving non-local information must be operating everywhere in the organism in parallel with classical space-time functions (1999:11).

There are certain pertinent yet unexplored implications that emerge from Einstein's general theory of relativity and in order to explore them requires a conceptual shift away from the standard account regarding the spatiotemporal parameters associated with the experience of life. Chapter Five is primarily concerned with ideas regarding specific physical parameters and inherent processes of the Universe amalgamated to form a new conceptual holistic apparatus called STEM, which in itself partly acts to describe energy in a modified way. The concept of STEM represents a co-evolutionary bridging mechanism within the concept of Nature. Perception in relation to all the sensory modalities crudely stated involves motion of some description. Whether that takes the form of a signal from sensory-receptors throughout the body transmitted to their respective brain sites where the information is encoded/decoded, or in the form of saccadic eye movements necessary for visual perception. In general terms, the act of perception is an act of motion, an act that concerns cognitive processes. Eileen Kowler (1995) has demonstrated that "cognitive processes are involved not only in high-level aspects of target selection, but in numerous stages of oculomotor programming, including those formerly believed to fall into the domain of involuntary sensorimotor events immune to cognitive influence of any sort" (1995:259). What this suggests is that cognitive processes more than likely form an integral part of a very early evolutionary condition of organism life; one that also forms a holistic co-evolutionary developmental mechanism operating between organisms and environment.

Information regarded as patterns of energy must inhere in the physical fabric of the Universe. Information transference in the classical sense occupies space and time, its duration is itself an event inasmuch as it is a physical process involving motion. So it is in this sense that the four relative concepts Space-Time-Event-Motion (STEM) after detailed analysis of the individual concepts are brought together to form a new concept. There are at least two ways in which to think about time: one as a measuring concept and the other in which it forms an integral part of the physical fabric of the Universe. In the latter sense time is associated with the mass of an object, which in turn is the measure of inertia whose influence is directly responsible for physically effecting the curvature of space-time as defined by Einstein's general relativity theory. Matter according to relativity theory is interconvertible to energy as described by Einstein's famous mass-energy equation  $E = mc^2$ . The fabric of the Universe we want to say is physical and as such is reducible or interconvertible to energy. Planck's constant is described as the constant proportionality between the energy emitted or absorbed by an atom and the frequency of emitted or absorbed light (Jibu & Yasue, 1995). Energy is indeed the fundamental substance of the Universe definable in terms of frequency. STEM, in this sense is employed in part to define energy. STEM provides a means to conceptually shift away from linear notions of causality (cause/effect) to an open non-linear understanding to encapsulate simultaneous or parallel processes relative to not only cognitive processes but also co-evolutionary processes that inhere in Nature.

A fundamental error arises when thinkers confuse the two distinct ways in which to construe time often as a result of conflating both senses. To demonstrate the significance of this error, Daniel Dennett and Marcel Kinsbourne's (1992) paper entitled *Time and the observer: The where and when of consciousness in the brain* is discussed with reference to two specific subsequent responses. Dennett and Kinsbourne present an argument in which they assert that certain phenomena resist the standard 'Cartesian Theatre' model of consciousness. In its place, they advance their own Multiple Drafts model. In the Cartesian Theatre model there is a central area somewhere in the brain where all the sensory information converges and is discriminated and somehow

registered and ‘presented’ for subjective judgement. Dennett informs us that the timing of the events in this theater determine subjective order. In contrast, sensory modal discriminations in the Multiple Drafts model are said to be distributed in both space and time within the brain. Dennett and Kinsbourne claim that although the events do have temporal properties they do not determine subjective ordering because there is no single “stream of consciousness”, only a parallel stream of conflicting and continuously revised contents. One crucial point rests on the distinction Dennett and Kinsbourne make in terms of the central observer and the Multiple Drafts observers. Another crucial point rests on the notion of subjective judgement, which is closely associated to the notion of knowledge postponed, however for later analysis in Chapter Six. Multiple drafts, moreover, of narrative fragments concomitantly occurring at various stages of “editing” are spread out over the brain so that the Multiple Drafts do not reduce to a single narrative.

The connection between consciousness and the timing of neural events, as Antonio Damasio points out in his reply, is an important one inasmuch as “time can provide the illusion of a single place” (1992:208). The central problem is to presume that time stands outside of us in the sense that when processes are measured that this will lead to discovering some new insight about consciousness. Time, it is argued is embedded in the organism, as it is diffuse in all matter. All conscious processes the argument suggests alludes to what ought to be thought of as ‘cognitive awareness’. Awareness means first to be cognizant and in this sense consciousness does not emerge from these processes, it underlies them. Such experiments are useful in discovering information about cognitive functions I suggest not strictly, however, features of consciousness. It now remains to make this point clear and to provide an explanatory model of consciousness.

Treating information as patterns of energy implicates the way in which the laws of physics are fundamentally construed. The laws of physics reflect the processes of Nature, to which organisms owe their existence and to which it (Nature) reflects a holistic system consisting of physical laws and psychological laws unified somehow in the world we experience. In Chapter Six I will explore

this notion and present a hypothesis based on a model of a triadic mechanism that is suggested inheres in Nature as its fundamental conditions or guiding processes. The Triangulate–Three Principle (TTP) (for literary reasons is stated as ‘principle’ when in fact is acknowledged as a hypothesis) represents a theory of consciousness that also provides a new perspective insofar as it is proposed as a principle of Nature intrinsic to its processes. In the TTP model the leading assumption proposed is to consider consciousness as a primordial stratum. In this sense, the physical Universe consists of a triad of basic conditions: Consciousness, Body-of-Experience, and Intellect-Reflective. Every element, thus, in the physical Universe consists of these triadic-conditions forming an animating principle existing in the most basic form as a minimum capacity of attraction, repulsion and neutrality, on the one extreme. So that on the other extreme when elements combine to form complex self-organizing systems can realize higher order forms of intelligence with associated attributes. An evolutionary position suggests that the internal environment of living organisms develops symmetrically with the external environment to which the PCAR conditions serves as a possible co-evolutionary mechanism. The STEM model at once forms a containment-field of energetic influencing activity within the organism and between it and the environment at every level comprising both orders of existence. The two orders of existence alludes to the Expression order of the physical actuated Universe and a potential seething flux of virtual particles of the quantum vacuum as the Impression order. The Impression order coexists at every point in three-dimensional space seemingly invisible at the Planck length. In the first part of this chapter the concept of two orders is outlined and further elaborated upon in Chapter Six.

Consistent with Bohm’s idea that matter at a very basic level consists of a kind of protointelligence, the TTP provides the conditions to furnish an explanation as subsequently described as the mechanism involved in the concept. The relationship between organisms and environment is one of reciprocity in an integral way whereby Nature’s information coheres with protointelligence as mediated in the elements, which subsequently reduce to energetic processes. This part of the model requires elaboration over two chapters where in Chapter Seven I shall present an overview of the fundamentals of Nature to draw

together an additional concept in-conjunction with the TTP. The TTP acts as a guiding principle by which evolution progresses and maintains itself. Natural selection consists of a mechanism, one said to be the driving force behind evolution. The accumulated effect of natural selection is to produce adaptations, but without an animating principle, Consciousness, Body-of-Experience and Intellect-Reflective, it is argued could not occur.

Consciousness as it is formed in the TTP is an animating principle, its form or “containment-field” is described as its Body-of-Experience a relative concept that can be as small as a subatomic particle, or as large as the very Universe. Explaining what Intellect-Reflective represents requires reviewing some of the important properties inherent in Nature primarily as reflected in living organisms. What it represents in conjunction with the other two conditions on a cosmological level will be developed in Chapter Seven. Chapter Six outlines an analysis of the concept of intelligence as conventionally constructed in relation to the cognitive faculties, relative to contrary points of view. One side refers to the adherents of factor analysis as developed by Arthur Jensen and others to describe a global element of intellectual ability as well as specific cognitive skills based on a continuum of general intelligence. In contrast, several approaches based on alternative theses are discussed in terms of the inherent problems associated with factor analysis. The outcome of this analysis suggests a middle path synthesizing both approaches. The idea of Intellect-Reflective as developed here refers to the cognitive attributes collectively subsumed under one concept representing the mind. There is no single anatomical structure responsible for its arising because it is an inherent property of all matter in-conjunction with Consciousness and Body-of-Experience together forming an animating principle. As the elements coalesce to form the human body or any other organism, the process itself advances relative to the environmental influences consistent with STEM energetic activity. The physical processes representative of Nature are subsumed and ordered to reflect the spatiotemporal energetic influences mediated by the triadic-conditions inhering in matter.

Recent biological discoveries suggest that learning engages a simple set of rules affecting neuronal behaviour regarding strength of connections between neurons

in the brain. Elementary aspects of the neuronal mechanisms thought to be important for several different types of learning are now being studied at both the cellular and molecular level. By exploring these concepts in light of the models presented in this dissertation allows for a new understanding to emerge. The most prominent contemporary approach to understanding the processes of cognition is to seek clues from errors to which the cognitive system is prone. One error to which the cognitive system is prone encompasses several disorders veiled as one, autism. Researchers believe that one crucial component underpins a special feature of the human mind, the ability to 'reflect' on itself. This ability is absent in autistic individuals. In a normal person, this innate ability enables one to judge mental states, to socialize and engage with others, to understand and speculate about psychological motives for our behaviour, and even to manipulate the opinions, beliefs and attitudes of others. This ability of the mind to reflect upon itself can broadly be defined as metacognition. Metacognition, as described in cognitive psychology, represents any knowledge or cognitive process that refers to, monitors or controls any aspect of cognition.

In the first section of this chapter, the notion of knowledge is analyzed with respects to some of the ways in which one can know. One kind of knowledge is identified as perhaps a form of 'tacit' knowledge that stands for an immediate *a priori* embodied kind representative of the 'what it is like' variety. An evolutionist perspective suggests that some type of embodied knowing is directive of evolutionary change (i.e. natural selection). This immediate (*a priori*) form of knowledge throughout history has served as a platform upon which various renderings, interpreted by many thinkers and given different appellations, has arisen through myriad guises. This form of knowledge is the kind that reflects the history and elements to which the repository is itself the knowledge commensurate to the triadic-conditions, Consciousness, Body-of-Experience and Intellect-Reflective in synchronous harmony.

Chapter Seven brings together certain ideas related to the fundamentals of Nature relative to two principal themes: dominance and opposition. In this chapter the standard worldview is modified somewhat to incorporate the conceptual devices advanced in the preceding chapters. The alterations are

necessary so that the laws of physics can be redefined to reflect the concept of information as patterns of energy thus making possible the reduction of both physical laws and psychological laws into one psychophysical kind. Central to this task is the idea of opposing forces also pivotally linked to the notions of 'charge', 'mass', and 'energy'. These notions represent three fundamentals of Nature that serve science in important ways. The idea of opposing forces and the notion of dominance also serve science as expressed in such terms as 'positive versus negative', 'attraction versus repulsion', 'matter versus antimatter' and recently emerging from cosmological circles 'dark energy versus dark matter'. This chapter presents an overview of the four forces of Nature so important to our understanding of how it fundamentally operates. Two contrasting models of cosmogony are discussed in relation to doubts raised concerning the standard model of cosmogony, the Big Bang Theory. An overview of the standard model of particle physics is presented in order to draw from to establish the basic concepts of a proposed adjunct model based on a two-dimensional Möbius strip-like topology representing the fundamental particles of Nature.

Nature ensures that the combination of extreme qualities can exist within a single environment such as a self-organizing system (e.g. human being). The structure of an atom is the embodiment of opposing forces whose unification is fundamentally necessary for the existence of the atomic whole. Amino acids differ in the human body, some are large and some are small, some carry electric charge while others are neutral, some are hydrophobic while others are hydrophilic. It makes sense that the fundamental building blocks of Nature have built into them polar opposites. That is, to have an inherent potential capacity to be attractive, repulsive or neutral, relative to Expression order STEM interactions. The proposed Möbius strip-like model is built up from already established concepts and related speculated proposals outlined here as the sort of geometrical shape capable of carrying polar properties. Topology may well be what determines whether an object displays positive or negative properties or has a neutral disposition. How the topology is influenced may indeed relate to the electric dipole moment, which is a hypothetical electric counterpart to the magnetic moment. This idea is discussed in relation to the magnetic dipole

moment which refers to a measure of the turning force that a magnetic dipole experiences in a magnetic field.

The conclusion brings together the conceptual devices developed in this dissertation to establish a new process philosophy that seeks to further our understanding of Nature in holistic terms. If we subscribe to a physicalist view of consciousness and employ the orthodox reductionistic methodology we arrive at a picture of matter, given Einstein's theory of relativity, as reducible to energy. Information when cast as patterns of energy provides a means by which to reduce all physical processes to energy-events, hence the concepts of STEM, SEF, and PCAR. Consciousness has no individuation – it is complete. The Universe is made up of seemingly separate entities all reducible not to smaller 'building blocks' but rather back to the whole from which the process of reduction first set to unravel. Reduction leads us back to holistic processes of unity as expressed through the concept of the quantum vacuum and Impression order as an enveloping seemingly invisible yet time-independent potential source of whatever comes what may.