A New Theory of Consciousness: The Missing Link - Organization

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Abstract:

What is consciousness and what is the missing link between the sensory input and the cortical centre in the brain for consciousness? In the literature there are more than a million pages written about consciousness. The perspectives range from the field of metaphysics to those of quantum mechanics. However, no one today has produced a theory which is universally accepted. Consciousness is "something" which the majority of humans know that they posses, they use it when they want to understand their environment. However, no individual human knows whether other humans also posses consciousness. unless some tests such as she is looking at me, he is talking etc., are performed. We are caught in an intellectual sort of recursive carousel – we need consciousness to understand consciousness. To understand consciousness we have to understand the mechanism of its function, which is to effectively organize sensory inputs from our environment. Consciousness is the outcome of the process of organizing these sensory inputs. This implies that organization is an act which precedes consciousness. Since every activity in nature is to organize/disorganize, what is the element which compels this action? I am proposing that just like energy is the physical element that causes action, there is another physical element I have called it *NASCIUM* which has the capacity to cause organization. This is the missing link. Understanding the nature of organization, i.e. *nascium,* will enhance our capability to understand consciousness.

Introduction:

There is a plethora of academic publications dealing with consciousness. However, after reading several, one will note that there is a unique intellectual substrate used extensively, which every investigator seems to recognize as a solid base for developing a theory of consciousness. The core of this substrate is the assumption that consciousness is constituted of the same nature as a "force" or a "field". Yet I did not find cogent proof that such is the case. It seems that it is popular to proclaim that Rene Descartes was wrong in assuming that there is a distinction between matter and spirit. The Cartesian model of existence has two aspects; one where the observer can use his/her sensory system to ascertain its existence, and the other where the observer does not have to use his/her sensory system. Yet, it seems that investigators of the nature of consciousness, modulate their theories with the Cartesian model by presenting arguments that consciousness is either subserved by microtubules, (but the microtubule itself is not conscious) (*Hameroff and Penrose, 1996*) or has some relation to quantum gravity, (*Penrose, 1994*) or it occupies a space such as *the global space* - Global Workspace Theory - A

theory based on cognitive neuroscience (*Baars, 1997*). The approaches used may vary considerably from one investigator to another: from denial of the existence of consciousness, to it being an epiphenomenon and present in every entity in the universe. There is a common aspect to all these papers; each author presents a set of questions that he/she feels previous authors have not answered adequately! Generally these questions have to do with what D. Chalmers calls "*The Hard Problem". (Chalmers, 1995)* This is the problem of qualia i.e., experiencing color, or being in love, or the beauty of a rose; experience, and phenomenal consciousness. In this paper I make the point that these are the problems emanating from what I call *level two consciousness* that I shall define later.

Consciousness is not only what we humans use to understand ourselves, our ambient, our environment and every 'thing' in it, but also consciousness itself. Understanding the nature of consciousness[1] cannot be achieved successfully by merely analyzing one of its attributes, such as behavior. It is like trying to understand the nature of a car by analyzing its capability of transporting people or articles from A to B. Nor would it be by analyzing a single neuron. I argue that since consciousness is an emergent process an effective way is to analyze not one but all the functions being executed when one is in a state of consciousness. It is somewhat analogous to wanting to understand how the moving images on a television screen synchronized with an auditory sound, are produced. Certainly it would not be by analyzing the nature of one component, such as a transistor; but by considering all its components and analyzing their composite effects. In the proposed *natural theory of consciousness* the state of consciousness is the emergent outcome, or the result, of the activity of organizing neuronal architectures. Later on in this paper I will show that the essence of organizing is the only implicit state of consciousness.

We human beings are the only entities in the known universe that have the capability to analyze the environment to a complex level of details, arrive at conclusions and communicate these to others. However, in the "overall spectrum of nature" what are we? From our analysis, I postulate that we are entities of nature that possess the greatest capability to organize. Since all the components that make us are the same that make most of the other organic entities on this planet, where does this ability to organize come from? Why is it that our next of kin, the primate, has only a limited ability to organize its environment? Where does this capacity to organize originate? We know that the capacity to carry out an action is imbedded into matter, and we call it energy. In an analogous manner where is the genesis of the ability to organize the making of this matter? I postulate that there is a physical entity I call *Nascium* that is analogous to energy, or a sort of an anti-entropy element, which has the ability to provide the capacity to organize. Since it is impossible to define existence without consciousness and since consciousness is the process of organizing, it is logical to conclude that Nascium is a physical entity and that it exists everywhere in the universe.

I suggest that not considering this physical entity, nascium, makes the study of consciousness and practically all other investigative endeavors ineffective. This physical element is disregarded by all authors, and I argue that it is the element which will provide all the answers in a logical and concise manner to a great number of problems presently emerging in many fields of endeavor, from astrophysics to biology. Intuitively we, the observers, assume that for something to exist it has to be structured, that is to say, it has to be organized. We feel intellectually comfortable when we can quantify the entity (an element of structure, or of measurement) with respect to other entities already known that we feel we understand. However, if we apply Heisenberg's Uncertainty Principle – Which states that two conjugate variables (physical variables describing a quantum system) one of which possesses an uncertainty which varies inversely to the certainty of status of the other – we conclude that we can only measure variables i.e. their attributes accurately one at a time. However, we must keep in mind that the observer is also a variable in the system of measurements and therefore this would influence the values we are trying to compare, a fact already enunciated by Einstein. Let us for a

moment consider this latter variable, the observer. Attributes are the observer's means to understand or acknowledge anything. A triangle becomes a geometric figure called a triangle because it has three sides (attributes) forming three angles. An apple is a fruit with a geometric figure (attributes) different from a pear because it has a different geometric figure, or texture, etc. different (the attributes) from that of a pear. If we could vary the attributes of an object, say, from type A to type X, without interfering with its structure, such that attributes of type A vary its values from almost non-existence to plenty of attributes for type X, where in the course of this spectrum do we cease to have the object? I suggest that this will happen at the point where there are no attributes recognizable by the observer. For something to exist independently of the observer or of a system of reference, it has to be organized with that objective.

In the Euclidean system of reference, existence requires only two elements energy and matter (organizes mass). However, as stated above, I suggest that the third element, nascium, is also part of this system and should be considered when analyzing "nature". Energy is the ability to do work and nascium is defined as the ability to organize this process or structuring so that, the outcome of the action of bringing these two physical elements together is to create matter.

When we embark into the quest to satisfy that inner urge to want to "understand" our environment, we employ comparative means to unscramble (disorganize and reorganize) the intricate web of attributes the entity has and those that it does not. However, what happens to our understanding when these "means" which we are using to understand are exactly those necessary to understand our understanding? To understand consciousness we must use the modality of consciousness itself. It is akin to using a knife to cut itself! Our experience and our limitation have been to collect and organize sets of attributes according to some relationships, preserve them in an easily accessible place and use them appropriately to understand our universe and every element within it. Attributes do not have an epiphenomenal nature they are exactly the "anti-epiphenomenon" or antonym. We are not capable of knowing a "thing" unless it is through the proper selection, organization and application of proper attributes. This implies that consciousness is void if there are no attributes to be co-related. One should note that attributes, as I will show later on, are physiologically, are sets of sensory "memories" developed during our growth. This is the reason why we have so many mysteries in our intellectual environment. When some of us analyze an entity, we classify it as a mystery because we do not have all the necessary applicable attributes to complete our understanding. While for others who seem to be satisfied with the attributes available, it is not a mystery. The removal of attributes from an entity is exactly the same as the removal of the shape or geometry of a triangle, or an apple, or a molecule. It is at this point where we must question the essence (an attribute of nature) of existence. What is the reality of existence, attributes or entities? What is more crucial, is to ask: can we really separate those two? These are actually recursive questions. However, we as humans do not yet have means to really answer them. Therefore, what we must do then is to associate our "feeling" of what the answers should contain with some objective aspects of our experience or intellect. Therefore, if we want to achieve our quest, as mentioned above, we have to include an understanding of "existence" in our attempt to understand the nature of consciousness.

For millennia humans have been curious about their environment and about their place in the universe. It was early in civilization when humans had divided existence into two aspects: the world that can be acknowledged through the senses, especially vision i.e. all material things, and the other part, the non-material, the spiritual, the part that could not be seen. Later on this branch of natural inquire became the philosophy of mind and body. However, it was the philosopher Rene Descartes who formalized the duality of our existence. We have one material entity and one spiritual and these, being separate entities

are dependent, since the body needs the soul to manifest itself. However both retain their own properties. Over the years philosophers presented another view of reality. This point of view states that the view that there are two realities is not correct. They argue that there is only one reality. This philosophical view is called *Monism*. However, Monism manifests itself in several ways. Figure 1 shows a summarized hierarchical delineation of the extent of further variations within these two viewpoints of human existence.

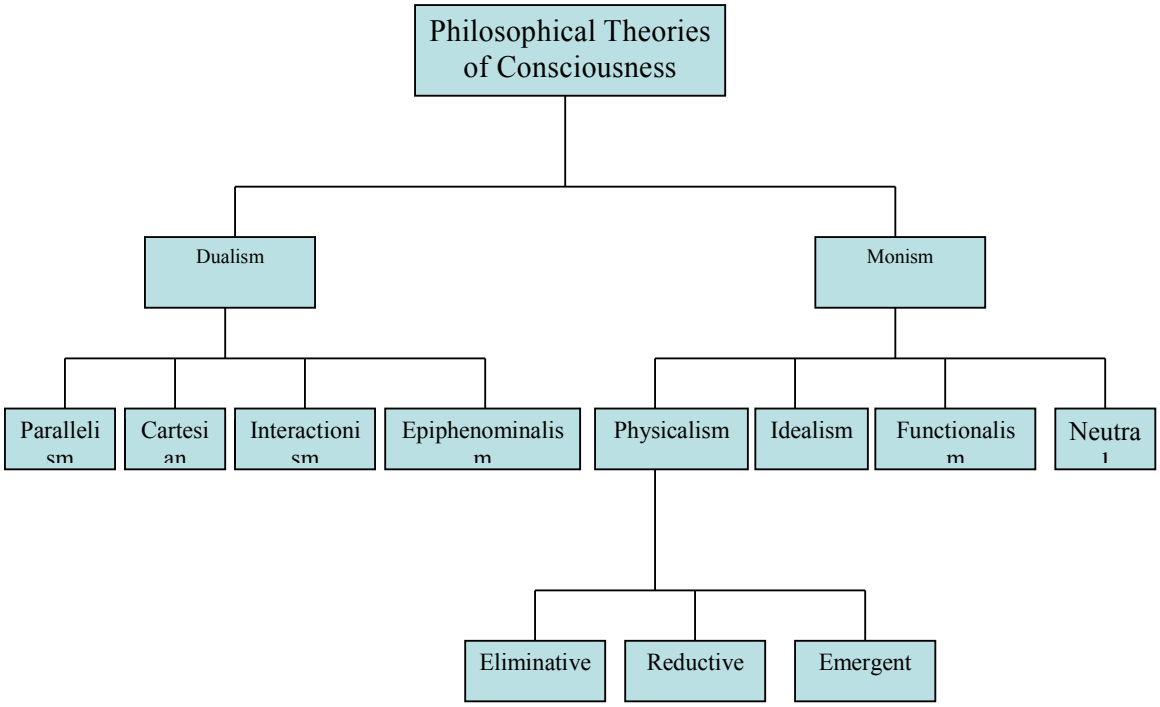

Figure 1. A hierarchical representation of the philosophical views representing the basis for the theories of consciousness.

Dualism – The view that existence can be explained considering the two fundamental entities Matter and Mind or Soul. The main issue with this view is the relationship between these two entities. Under this theory there are other slight different views of the relationship: **Parallelism** – Affirms that there is no causal relationship between the mind and matter. **Cartesian** – Mental phenomena i.e. consciousness, self-awareness are separated from the brain and it is an epiphenomenon of intelligence. I**nteractionism** – This view holds that there is a casual relationship between these two elements consciousness and brain. **Epiphenomenalism** – affirms the view that almost all if not all mental states such as consciousness are mere epiphenomena. **Monism** – The affirmation that mind and matter are united into one reality. The issue with this view is what is the nature of this ultimate single entity? This view is conducive to the adoption of reductionism for explanation of natural phenomena. **Physicalism** – affirms that reality is manifested by physical entities and other aspect of reality such as consciousness can be reduced to physical reality. Under Physicalism there are other three branches: **Eliminative** – The affirmation that mind and consciousness do not really exist. **Reductive** – argues that consciousness is a physical entity within the brain. **Emergent** – Affirms that when entities come together in an organized manner, their interactions produce new types of phenomena with properties different from the components that came together. **Idealism** – holds that the only existent entity is the mind. **Functionalism** – This holds that the mind or consciousness is a set of causal relationships between the entities involved. **Neutral** – holds a view between materialism, which has problems with consciousness and idealism which has problems with matter. It holds the view that reality is neither totally material nor mind but of a substance which is even more fundamental than these two!

These two aspects of viewing reality that have been the substrate for the theories of consciousness put forth so far. My view of existence or reality falls under the concept of monism. Monistic philosophy assumes that the universe and all the entities that make it up, including mind, soul and brain are composed of one substance only. However, this substance manifests itself in different states of

organization. None of these views have universal acceptance. However, monism seems to have a greater acceptance level than dualism and seems also to be creating momentum. However, both, critics for dualistic views and critics for monistic views each have cogent arguments that point to the incompleteness of each of these views. Both circles of thought call for a novel way to address this yet unsolved problem. The theory of *nascium* that I am proposing offers a novel way to understand this old problem. Although it combines some views from the dualistic and monistic perspective it is weighted with more of the monistic perspective than the dualistic view. The theory of *nascium* complies with views such as: (**dualism**) Interactionalism; (**monism**) Physicalism, Reductive, Emergence, and Functionalism.

The theory of *Nascium*:

Introduction

There is an activity that continually takes place in all aspects of reality. Each entity that exists in the universe has to follow the process of organizing its elements to be assembled into a form whether it is in the process of a seed germinating, a plant growing, a government being structured, a symphony being composed, an ant colony being started, a snow flake being formed, a financial deal being prepared, an idea or a book being structured, or a galaxy being formed. Thus, an entity is born.

The activity of being organized can be viewed from at least two perspectives: a) those entities that come together by themselves from physical properties of the elements, or b) there is an external "force" or "field" which compels the "right" elements to come together.

Before we explore the arguments for either of these perspectives, let us describe another type of manifestation. Consider the following example: You are given a CD with a diameter of 13 cm, which is slight larger than the present computer standard CD drive and thus it cannot be played with the present drives used in the computer. The legend on the CD says that it contains among other programs, a proven, undisputed methodology of how you can make a lawful 75% financial profit buying and selling stock and following the procedures and rules of today's stock market, on a weekly basis. However, you do not know what format was used to burn the information into the CD and you have no appropriate computer to view its engraved information. However, you have access to a microscope which allows you to see with good resolution up to the molecular level. If you place the CD under the view portion of this microscope and look at its internal structure, where would you find the information engraved in it? You could see the molecules but, what else? Could you see the information? Certainly not. What you could see would be molecules arranged into patterns. But although you could not see any information, you know that there is information in that CD that could transform your life. However, if you notice that the observable structure has a pattern, you could easily deduce that the information is coded into the patterns extracted from that structure. The next thing is to translate these patterns into some other patterns that you are familiar with or "understand" such as the letters of the Latin alphabet. Then after the molecular patterns are decoded into other patterns such as letters, you would have to place these letters in an order, which would comply with a language i.e. rules or patterns of acoustic pressure which hopefully you would understand. Now let me ask again in a slight different way: what is a pattern in which information can be stored for later retrieval? The variations in the attributes of the entity can form patterns. The formatting of the variations i.e. encoded patterns, carries information. Therefore information is the outcome of structures (organizations). Therefore, to transfer information or to assemble data into information requires rules; more of this in the next section. These rules are outcomes of processes enabled by *nascium*.

When we observe our environment, what we notice is that every activity incorporates organizing elements to form an entity in its own right. whether this is a movement for the formation of a galaxy, the process of thinking, the formation of a seed, the structuring of a protein, the building of a space ship, the construction of a termite mound, the analysis of the outcome of a research activity, or the structuring of a biofilm.

The result of every activity performed in the universe is to organize either positively or negatively. I postulate that there exists a physical entity which I call **Nascium,** which acting *analogously* to a catalyst provides the necessary means to cause organization to happen.

Organization occurs due to a certain order stemming from rules or norms without which there cannot be order. Just like the physical entity, energy, which is the capacity to do work, **Nascium** has the capacity to organize how the work is done. Nothing in this universe happens by chance. Note that whenever we refer to events occurring *by chance or randomly* we actually imply that the events occur in a non predictable accurate manner. In other words we may know that the events may occur but we do not know exactly when or how they occur. Events are unpredictable because we have not deciphered all the variables, their relationships and the rules or norms governing their behavior yet! If I know all the variables and their relationship in a well described event, I will be able to make what was random/by chance, to be definitive and predictable. I argue that the task of describing all the variables and their interaction may be daunting. However, it is possible and one could measure advancement in science or in civilization by considering that advancement in these areas varies inversely to the number of events that are considered to occur by chance.

I propose that Nascium is the rule generator, i.e. forces or fields (in the same manner that energy provides "its power") to formulate order and thus organization. Whereas energy can be represented by scalar fields, *Nascium varies inversely to entropy and I suppose it could be represented by a vector field or its more complex form of tensor field.* As a vector field *Nascium* could be modeled mathematically by the integral of the curl of the vector force with the distance, (energy) and the dot product of a function of data and a function of their respective context. This model is only a preliminary intuitive representation and a more rigorous derivation could be formulated and tested. Moreover, the theory of cosmological constant could be revisited in the light of this new proposed physical entity Nascium.

Considering Nascium as a new physical element, we could express reality or existence to be composed of three elementary elements: Energy, Nascium and Matter. Let us for a moment only consider time. In an Euclidean system time. Time exists because there is a change. It is the is the duration between considering A and *then* B. It is the feeling evoked by the interval between one state of consciousness and another. This is a definition of time as viewed by the observer. However, Can time exist independently of the observer? How could it be defined? I propose that time is an element of nascium since time is the operational component of organization. In a Euclidean Universe there cannot be organization without time. Therefore, when considering existence, time is relative to nature of the organization.

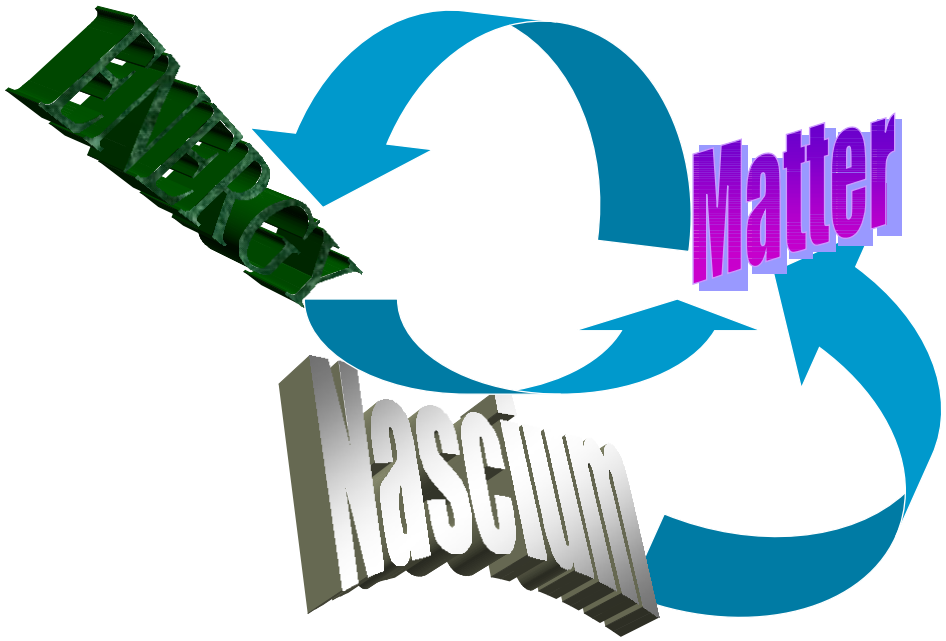

Fig. 2 Manifestation of existence. Illustration of how the three physical entities come together to form existence. If E is the energy of particles in a micro state and P is the density in phase space then the entropy S is defined as: $-K \Sigma P \ln P$ where K is Boltzmann's constant. Now consider the equation for energy $E = mc^2$; Nascium which varies inversely to entropy S, could be deduced to be a function of "c", since time is an element of nascium.

In an Euclidean universe the nature of an object is the action, of these three components. However, according to the above expanded theory, matter, i.e., organized mass, is the coming together of the entities energy and nascium. Thus subsequent constructs must include in varying degrees of relevance the primary elements energy, nascium and matter. Energy manifests itself as heat, work or motion. Nascium manifests itself as force and rules - other expression for force. For example: in certain molecular pattern formation which is aided by "forces" such as those of enzymes or catalysts, this "force" of the action is embedded, just like information, into the patterns of the respective molecular format of the enzyme and of the reactants. Therefore, an action such as organizing material things is the result of the process of the interaction among energy and nascium, and matter. However, in the organization of data into information, or processes such as thinking, the action may be the outcome of energy and nascium and restructuring patterns of neuronal architecture - utilizing matter. I differentiate between neuronal network, which is the is a network made up of cells as nodes, dendrites as conducting elements, and synaptics as connecting points. When a set of these nodes are not active ie experiencing action potentials, I refer to these as neuronal networks. When set of nodes are experiencing action potentials I refer to these as neuronal architectures.

Why should we introduce a new physical entity as an elemental part of existence? To answer this question one should consider the importance of this entity for understanding our environment including ourselves. If nascium is important where would its attributes manifest its sine qua non presence? Would it be a necessary condition that we find effects of this entity in all natural events, such as processes,

actions, functions, systems, etc.. It may seem apparently quite trivial to state the fact that the only activity that humans do is to organize or cause to organize. In these cases the humans "invent" the rules of the order that apply to the action of organizing. But where were these rules originated and how? Whether the human is writing a note or an encyclopedia, building a sand-castle, or following the urge (nascium – force) to perform the action for procreation, there is an order that must be followed and there are rules that have to be formulated; the question is where do these rules (forces) have their genesis? The urge to organize (nascium) is as pervasive as energy. Not only does nascium generate the organizing of events that humans do, it does it for all the events of every other living and non living entities in the universe. Therefore, if organizing is the only event that we do, whether is speaking, or thinking, or building a ship, or observing events in our environment, should it not be an activity of paramount importance to be included or considered in our endeavor for understanding our nature? What arguments would be put forth for a "no" answer? Someone may say "Just because water is the most common compound in a human body, knowledge of water would not increase our understanding of say "cancer"! This is because we already know quite a bit about water we can say that! We do not know very much about organization. We know that an ant colony can function, i.e. perform the act of organizing without an ant that invents the rules to govern/direct the colony, or a termite's lack of an architect or schematic for their multi-inhabitant building. Understanding the mechanism of how things are organized does not imply we understand the nature of organization. I postulate that having an identifiable entity with the capacity for organizing, such as occurs in the ability of energy to do work, we can develop a comprehensive understanding of this attribute of reality.

What we know about organizing is that it has to have several entities that come together. These entities to come together in what we call orderly and organized form and have to have either or both inter and intra relationships which can foster the organizational objective. For this end the variables' relationships are consummated in a format which is termed "order". However, one cannot have an "order" without at least one rule. Therefore, for organizations to exist there had to exist activities followed by some rules, which were either incorporated in the variables, or explicitly provided by external variables affecting the structure with relationships for interfacing between the entity and the environment.

To organize requires activities performed by entities, which consummate their respective relationships. Therefore, the nature of an action is the dynamics of consummating relationships between entities. Just like energy which provides the necessary elements for some work to be done, nascium provides some rules for how these relationships between entities can be formulated. The manifestation of nascium in this respect could be exemplified within the discipline of systems, complexity, self organization, and emergence. Please note that there cannot be phenomenon of self-organization without the "self"!

Further analysis of examples from the above mentioned disciplines and other aspects of reality lead us to formulate principles, based on the theory of nascium which will facilitate our "natural" endeavor to understand (i.e. to experience the dissection the organization of entities into their attributes and their relationships) our environment. For example: Every organized entity wants to maintain its structure unless there is an external "force" with greater capabilities to counteract that internal one. The order for organization is regulated by the following principles:

First Principle: Every individual member of a species and the species itself has an organized structure which results in processes that compel the entity to maintain the integrity of its architecture – i.e., self

preservation.

Second Principle: Every species – as represented by the individual member – has processes to renovate itself by procreation balanced by senescence and death.

Third Principle: A species that obeys the first and second principles could have cognizance of its ambient.

Fourth Principle: All species – as depicted by the individual member are integrated to form an ecosystem, which obeys the first principle, i.e. it possesses those intra/inter dependent variables which are essential for survival.

Fifth Principle: A terrestrial Ecosystem – as represented by member subsystems is a living system and thus will renovate itself, i.e. follows the first principle.

What are the consequences of applying the theory of nascium described above as an additional tool for understanding our environment? The adoption of this new paradigm, nascium, into the scientific arsenal could impose the revisiting of scientific theories that are presently not universally accepted. Moreover, if we apply the first principle to any entity in our universe we could conclude that every entity will create, as an outcome of its architecture, a strategy to maintain the integrity of its structure and thus the integrity of its species and the integrity of the eco-subsystem and the ecosystem, recalling that a system is an entity with functional consequences. However, if we apply the nascium theory into research endeavors, we will have to consider that the structures carry information or data along with a strategy to maintain the integrity of the entity. For example a tumor or a bacteria will "have a strategy" to maintain its integrity. This implies that a) instead of adopting the theory of "the survival of the fittest" consider the theory of "the survival of the one that has the most effective strategy," Also this approach would provide a more scientific platform instead of hovering around the definition of "fittest." b) instead of adopting the theory of "competition" among the organic entities, consider the control theory of systems. If the ecosystem is a closed system its stability can be achieved through a feedback control approach which can be dynamically regenerative or degenerative. One can see that these examples obey all the principles stated above.

A major consequence of adopting the theory of nascium is that it can shed some understanding of the nature of consciousness to the extent that it becomes a sine qua non. Why do we need nascium to understand the nature of consciousness? Because we define consciousness as the emergent outcome of the processes of organizing neuronal architectures. These neuronal organization processes are compelled to comply with the organizational law that states that an organized entity is compelled to maintain its organization until a greater force counteracts it and compliance with the above mentioned first principle.

Consciousness – A Natural Theory:

Review of extant theories

To understand consciousness we have to first have a clear definition and theory of consciousness that provides a platform where cogent explanations of all aspects of consciousness can be put forth. This theory to be adequate should also explain what happens to our consciousness when for example, we are under anaesthetic (often referred to as being unconscious) have a physiological mishap or injury in the brain, or experience the contemplation of a colorful garden, i.e., understand its "anatomy." This is not the approach generally used by investigators. With the exception of the neuronal correlation of

consciousness put forth by Francis Crick and Christof Koch (1994, 1995, 1998) wherein they use sight as an example of the neuronal correlation for consciousness, other investigators deal with consciousness as if its nature is independent of sensory inputs. My hypothesis is that consciousness is the emergent outcome of several linked processes (outcomes for sensory systems) which *are organized* to form specific neuronal architectures. The most elemental of these processes is the electrochemical input to the brain cells which originated as external stimuli on specific receptors that in turn generate electrophysiological phenomena such as action potentials to occur in specific areas of the nerves system. These ascend to multiply loci in different parts of the brain. According to some investigators, i.e. Crick & Koch, it is the synchronization of these actions that results in consciousness. Crick termed this the "*Astonish Hypothesis"* In this book and subsequent articles awareness and perception were used interchangeably with consciousness. However, my hypothesis states that perception is different physiological construct from that of awareness and are elements of the subconscience and consciousness is the process of organizing *awareness;* its manifestation is the emergence outcome from this process. In other words it is the action of organizing i.e. of manifesting nascium in real time which gives origin to consciousness. I believe the main difference between my hypothesis and that of Francis Crick and Christof Koch is their hypotheses of synchronization of sensory stimuli to several loci in the brain, the Global Coherence and the Binding Problem, and the integration of perception, awareness and consciousness. In the proposed theory the Global Coherence are not necessarily synchronized, although this activity may be a set of overlapping times where an activity starts before the other ends. The other difference is that the new theory differentiates between perception, awareness and consciousness.

Humans have tried to understand who they are for thousands of years. To understand an entity we have to reduce it to its elemental attributes. An entities which differ from another is because it has different attributes. If we dissociate the entity from its attributes we are left with no means of describing it. John Locke (1632-1704) - *The Origin of Forms and Qualities* – would have had a hard time if he had tried to understand things through their primary and secondary qualities without using attributes! However, what are attributes? What is the relationship between the entity and its attributes? Do the attributes belong to the entity or to the observer? Attributes are qualities which have roots at our sensory constructs. Humans have at least five sensors. If one sensor within the set of sensors is faulty, or different from the set of another observer, the reality of these two observers is not going to be the same. The sensation of colors which Helen Keller would "see" would have been different from mine! Therefore, it would be reasonable to postulate that reality or the sensation of reality depends on the comprehensive and wholesome aspect of the sensory system of the observer.

To understand consciousness therefore, we have to perform at least two activities, one is to identify all of its attributes and the other is to formulate a theory in which these attributes and their inter relationships would form an essential part. It is worth remembering that an effective theory is a set of statements which when combined would provide cogent explanations of all aspects of things for which the theory stands.

Literature abounds with theories for Consciousness! However, till today no one theory has been effective in facilitating the understanding of all aspects of consciousness. Antti Revonsuo (2010) – has provided an excellent review of the present day's most influential theories of consciousness.

In his review, Revonsuo separates those theories into two fields of endeavor those that are (a) philosophic in nature and (b) those that are empirical. Under the philosophic aspect he reviewed the nine major ones:

1 - *The multiply Draft Theory* proposed by Daniel C. Dennett between the years 1990 and 2005. According to Dennett, consciousness is a component part of the accessing of information for

processing. He makes arguments against the idea of phenomenal consciousness and thus consciousness cannot provoke the feelings of quality.

2 - The next theory is that of O'Regan J. K. and Noe A. *Sensorimotor Theory* proposed in 2001. Their theory is very similar to that of Dennett; that it also denies the common belief that consciousness evokes feelings and asserts it is our sensorimotor aspect not our internal representation of the world, which provides stimuli for our behaviour.

3 - J. Searle, in 1992 proposed a view, "Biological Naturalism" as a theory of consciousness. In this theory which Searle called *The unified Field Theory of Consciousness,* he asserted exactly what the latter two theories deny. The unification aspect of Searl's theory is that each feeling is integrated into one whole for a particular experience.

4 - In the mid 1990's David J. Chalmers divided the problem of defining consciousness into two aspects. He called one the *hard problem* and the other the *easy problem.* The easy problem is to understand the cognitive and neural correlates of that subserve consciousness and the hard problem is the correlation between physical systems with that of feelings, and qualitative experience. He separates brain from consciousness. His theory seems to be anchored on the psychophysical view of our world such as the theory of *panpsychism*. His theory is generally referred to as *Naturalistic Dualism.*

5 - The next theory Revonsuo reviewed is a theory that has many variations. However, he selected the views expressed by one of the best disciples of this view, P. Carruthers (2000). The theory is called *Higher Order Theories of Consciousness.* In 2007 Carruthers affirmed that the state of consciousness arose from mental states which are not conscious. We have several mental states and some of one type have relationships with others of other types and this interface between states produces consciousness.

6 - The next theory he reviewed is *Externalist Representationalism* proposed by M. Tye and F. Dreske in 1995. Just as the title indicates this theory adopts the idea that there are mental states which are representative of sets of information about objects outside the brain. Therefore, all mental states of feelings and qualitative experiences are representational thus producing consciousness.

7 - The seventh theory reviewed was that proposed by F. J. Varela, A. Lutz, E. Thompson, and A. Noe it is referred to *Neurophenomenology.* In this theory consciousness is not an element of the brain. However, the mental state and the mental acts embody consciousness which resides in the bodily interactions between the organism and the world.

8 - In 2009 M. Valmans rejected the view that representation of our world is through phenomena. He proposed that phenomenological correlates of the world are in the brain but consciousness is a subjective effect outside the brain. His theory is referred to as: *Reflexive Monism Theory of consciousness.*

9 - The last theory that Revonsuo reviewed is the *Virtual Reality Theory* put forth by T. Metzinger and S. Lehar. These authors wanted to address the idea of the location of consciousness, which was cause for criticism of the other theories. This theory considered that the qualities of sensations such as

vision, or our experiences, are located with the object seen rather than in the brain. For them consciousness has the characteristics of a virtual reality.

There is no philosophical theory of consciousness that enjoys the greatest popularity among philosophers. There are some, as the ones mentioned above that have adherents. However, one can safely state that from a philosophic perspective, the question of what consciousness is, and even where it is located, is still an open question. There are three major issues which, depending on the fundamental background assumptions made, causes investigators to differ when structuring a theory of consciousness: No one has put forth cogent arguments to explain whether consciousness occupies space and if so where is it located. This begs the second issue which focuses on the fundamental nature of consciousness. The third deals with the issue of the form of phenomenal consciousness. The most popular of these theories of consciousness only addresses some aspects of all these three fundamental issues.

The second field of endeavor dealt with by Revonsuo is relates to those theories that approach the problem of consciousness from an empirical perspective. Just like the philosophical perspective which does not consider all the theories published, the review of the proposed empirical theories about consciousness deals only with seven of the many theories that could be considered to relate to the empirical aspect and also have greater acceptance among the investigators in the field.

1- The first theory reviewed by Revonsuo is that put forth in 1988 by Bernard J. Baars in a book entitled *A cognitive theory of Consciousness.* In this theory Baars proposes, from the cognitive aspect, that there are two elements in the brain. One element is made up of many different types of modules. These are processors of sensory inputs. These modules being different due to different sensory inputs compete for access to the second element which Baars calls the Global Workplace. This global workplace contains consciousness.

In the proposed theory these modules are similar to the sets of neuronal architecture which represent sets of perception. In the new theory there is no need for the Global Workplace. Therefore, these modules or more likely sets of neuronal architectures do not have to compete with each other. As they are transformed from neuronal network into architecture ie become activated are utilized for a short period of time and then return to be pure networks.

2 - The next theory was proposed by Sir Francis Crick and Christof Koch – *Neurobiological Theory of Consciousness* – in 1990, which was deduced from a neurological perspective. In this theory the authors refrained from proposing a description of consciousness therefore, it became more a methodology for studying consciousness than a theory explaining the nature of something which they did not distinguish from awareness or perception. However, they investigated the possible neuronal correlates of consciousness and proposed that this was the most effective method to study consciousness. The base for their concept was what they referred to as essential nodes. These nodes were sets of neurons which represented one aspect of a sensory input. They formed a distributed network that they called a coalition. When these coalitions became active by synchronous firing they generated the content of consciousness. However, behavior control occurred outside consciousness and was stimulated by special types of what they call zombie agents.

The new theory differs from the above in that the activities through the sensory inputs are not

necessarily synchronized. However, these could overlap. Secondly in the new theory there cannot be zombies because these fictitious entities do not obey the first principle as stated in the proposed paradigm of nascium. Moreover, in the new theory behavioral control is the process of consciousness. Consciousness is the organization of awareness for the purpose of formulation a behavior either for present or future use. The purpose is entirely based on effective compliance with first principle.

3 - Between the years 1989 and 2000 Giulio Tononi and Gerald Edelman proposed the *Dynamic Core and the Information Integration Theory*. In a book - *A Universe of consciousness,* These authors proposed a theory which combined the independent views of Edelman and that of Tononi. Edelman earlier on had proposed that during brain development, experience and behavior fostered causes to have some groups of neurons dominate others. These stimulated the formation of groups among some distant neurons. These physiological conditions which involved, depending on sensory conditions, different groups of neurons in the brain, such as the thalamus and the cortex: these would be coordinated and thus form consciousness. Tononi on the other hand expanded on the field of information. He based his theory on the assumption that consciousness represented an integration of many fields of experiences and sets of mental states. Moreover, he suggested that a system which can experience, should be able to integrate information. Feelings of any form are reactions to sets of information. Thus consciousness can be quantified by quantifying the amount of information sets which are being integrated. For Tononi the key element of consciousness is information and its integration.

4 - The next theory reviewed was that of Rodolfo Llinas, — who in 2001 presented his Thalamocortical Binding Theory in book *I of the vortex: From neurons to self* . This theory was essentially similar to that of G Edelman and G Tononi. However, Llinas used more detailed explanations of the physiology of the thalamus involved in the production of consciousness. His detailed account of how the integration of many sensory processes could produce a particular awareness involves the integration of information processing. Although he associated some physiological activity in the cortex of the thalamus with the production of 40Hz Gamma-EEG signals, he did not present convincing arguments of the importance of these electromagnetic radiations to consciousness.

5 - Electrical signals are characterized by three elements: Temporal, State, and Energy Content. Empirical investigators into consciousness have been focusing on single aspects of electrical signals. Some focused on the frequency e.g. gamma – EEG signals of composite processes, while others on the temporal aspect, e.g. 100 to 150 milliseconds of activity. V. A. Lamme in a series of publications since 2000 has investigated the temporal activity of processes in the visual cortex. He correlated the time taken from visual stimulus to start of cortical process (from 30 to 100ms) to consciousness (from 100 to 300ms).

6 - Other investigators such as S. Zeki and A. Bartles who in 1999 (Towards a theory of visual consciousness, *Consciousness and Cognition, vol. 8)* proposed a theory which did not consider the integration of information to be a consequence of consciousness. Instead, they based their theory on visual perception and anomalies in its physiology such as achromatopsia and other conditions to make the point that the conscious aspect of the redness of red, for example, starts right at the primary visual cortex of the occipital lobe, V4 and V5. This was felt to be true with all other aspects of feelings. These are sets of consciousness i.e. feelings, that when integrated, form total consciousness. Zeki assumes

that for example the perceived bits of color are integrated to form an object. The sensory inputs are totally distributed throughout the primary visual cortex, when activated they come together and form consciousness.

7 - The last theory reviewed by A. Revonsuo is that of A. R. Damasio, a neurologist who made use of the deficits in reason, emotion, etc., and ideas to form his own theory of decision making to formulate a theory of consciousness – *The feelings of what happens* – which he published in a book of the same name. The base for his theory is his assumption that the physiology and more specifically, neuronal patterns within the brain correlated to consciousness. These patterns stimulated by sensory inputs, are unique, represent objects, and incorporate patterns for producing interrelationships between neuronal patterns. The state of consciousness became active when there is a change in pattern activation. Damasio's theory does not explain to the satisfaction of philosophers how the patterns give origin to feelings or phenomenal consciousness.

A Natural Theory of Consciousness:

All the above mentioned theories and several others not mentioned here have something in common. Whenever we describe an entity we include in the description its functions, capabilities, objectives, and other attributes. All the theories that I read, in their explanation of what consciousness is, do not include these or other functional attributes. Some theories were not completely dysteleological, they included some form of purpose by stating that humans have evolved to the state of having consciousness; as if stating that it is a product of evolutions, is sufficient! There are some other investigators that use the same rationalization except that they do not use evolution as their reason.

In the proposed new paradigm of nascium, any organized entity is compelled to maintain its structure. Since the entity (may) exist in an ambient where there are forces which act on the organization to reduce it to its simpler structure, i.e. natural "reduction" of nascium, the entity, as a consequence of this constitution has a set of self-induced activities that serve to maintain the level of nascium and thus its structure. A human being is a multitude of many organic entities which function as a communal unit. This as a product of nascium follows all its principles. Therefore, one of its endeavors is to formulate "*strategies*" to maintain its existence. In other words there are at least two reasons (levels) for the existence of consciousness: First reason (or 1st level) is to organize activities for the entity to ensure the maintenance of its existence, and thus the existence of the human body and of the species. This level is depicted functionally as "primary controller", see figure 3. The second reason (or 2nd level) for consciousness is to organize, (i.e. utilize procedures such as strategies) the sensory inputs i.e., reflections of the environment, or their consequences into sets, which eventually could be accessed by the process of consciousness and used to serve to formulate the above mentioned strategies. This level is depicted in figure 3 as the secondary controller. Other organic entities may not have these two levels of reasons, or if they do, these levels may not be of the same caliber that human beings have. Moreover, other animals will have one of these levels and most likely, it will be the first level i.e. it will be the one needed to formulate first level survival strategies according to nascium's first principle. Unicellular organisms, such as an *Escherichia Coli* will not have the same degree of sophistication or complexity of the primary controller of the multicellular organism which also has only level one reason of consciousness. A cell, a fish, a tree, and a human being, by way of examples, all have level one controller, "reasoning", but each one will be structured to formulate survival strategies whose complexity will depend on their structure and the ambient in which they live.

The anatomy of consciousness, in level one to some degree, and also in level two, has the following elements: a sensory system, perception, awareness, and the emergent aspect of all these: consciousness. All these elements will act together as an orchestra to produce what we, the observers call *strategy.* This strategy is formulated for the survival of the entity. Regardless of what this entity is a tree, a baboon, or a government, whatever entity, it used nascium to formulate its existence even if it is one or sets of galaxies, there will be a tendency for this entity to maintain its integrity and therefore a *strategy* to ensure this end will be accomplished. The accomplishment of this end is actually a manifestation of nascium.

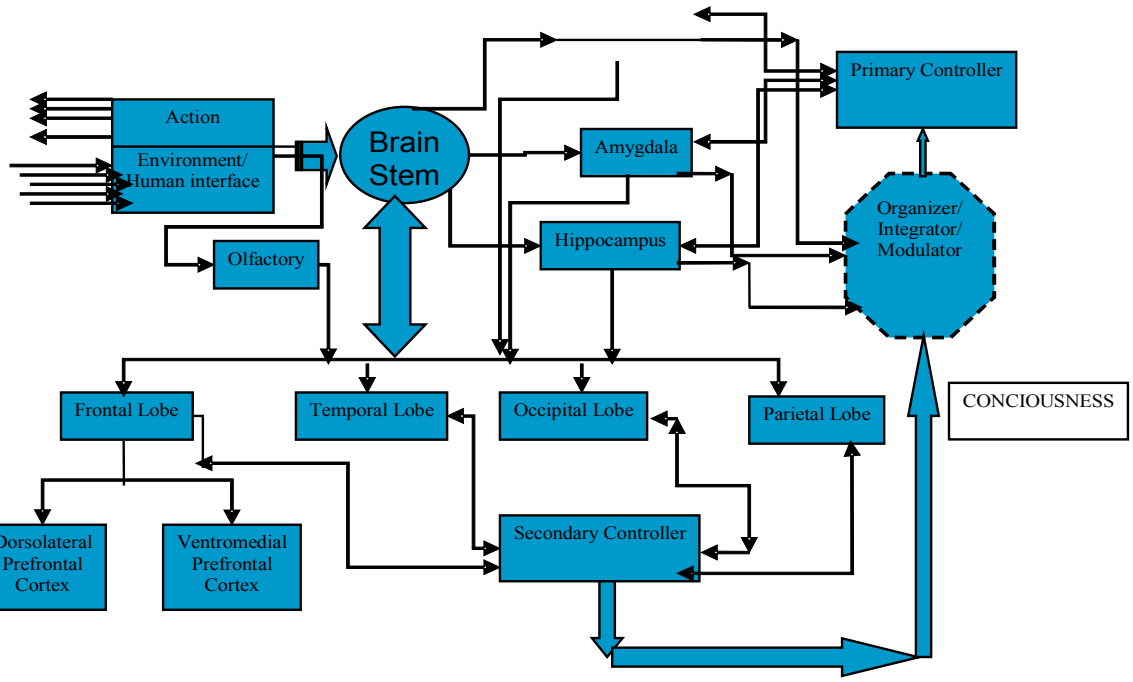

Fig. 3 A simplified diagram depicting the functional physiological components of the consciousness system. The midbrain receives sensory interfaces from the environment and outputs to the environment actions which affects the status of the entity and/or the environment. From this area the signal from sensory physiology enters the Brain Stem. There the various nuclei receive these electrochemical signals as depicted in the diagram. The initial control of these signals is provided by functionally distributed "Primary Controller" Which is logically depicted as a box. In parallel to this activity there is also a subsequent activity, which in humans is controlled by the "Secondary Controller" Where this controller primarily oversees the activities the cerebral hemispheres.

Although I may be accused of being reductionist, it is important to distinguish between the emergent outcome of a group of components working together and the attributes of each of these components so that we can build effective models to explain physical reality. Figure 3 depicts in a simplified way the components and their cooperation to form a consciousness system that illustrate the emergent outcome depicted as the "Organizer Integrator Modulator" as being what we call *consciousness.*

In the following I will explain the elements of the anatomy of consciousness. Unfortunately in the literature there is a blending of the meaning of the attributes of perception and awareness to render them in being used interchangeably with consciousness. I propose that each one of these three terms

should explain different aspects of consciousness.

For this theory *sensory* means the interaction between the entity and its environment. The conduit of this interaction can be electromagnetic energy or a chemical molecule which can affect the state of the entity. These sensory inputs: olfactory, tactile, auditory, gustatory and visual, input into the entity. Their input can change the status of the entity provoking an action by the entity. The input of each can be stored as a unique sensor input or as a set of several sensory inputs for later use as a simulated input to the entity or what we the observer call *attributes*. These inputs result in the development of the following:

Perception: is the response of the entity following the input. The general believe is the opposite, i.e. the response follows the input. An example is: an *Escherichia Coli* rotating its flagella. For a *Vibrio Fischeri* bacterium perception starts when the process of producing the protein LUXI is initiated and culminates at the assessment of the number of other cells to start the production of light. Recall that perception is the most primitive activity of an organic entity which represents the first level of consciousness. In a multicellular organism perception is still the most primitive form of the first level of consciousness but of a higher degree than in a unicellular organism. However, its manifestation will be more complex than in a unicellular organism. In a multicellular organism such as the human being, perception may be stored in sets of sensory inputs i.e., attributes, in various areas of the brain.

Awareness: Just as perception is a neuronal architecture which represents a high degree of level one of consciousness, awareness is the process of organizing perceptions into sets to be accessed later on to formulate strategies. These sets of perceptions will be stored in specific areas of the brain. I differentiate between architecture and network. Architecture in our case represents a non-epiphenomenal structure. The theory of nascium states that information is conveyed through the organization of a structure as for example the information in an enzyme, or a software within a CD, is part of the architecture of these devices. A neuronal architecture is a distributed neuronal network with active action potentials that conveys data or information. Nevertheless, a neuronal network is just a potential conveyer of data or information. The organization into sets of perception is made and stored especially with the goal that these will be used by the brain to formulate strategies for sustaining and enhancing the survival of the entity, i.e. self preservation.

Consciousness: Is the outcome of the process of organizing awareness into sets for later retrieval. This involves all aspects of levels one and two. Recall that level one is to place strategies into action for the sole purpose of maintaining the structure of the entity. Level two is to formulate these strategies. Human's consciousness differ from other animals by the degree of complexity of level two. Humans possess the highest degree of complexity for level two while for other animals level two may not exist at all and if does it does only in much lower degree of complexity than humans. However, one cannot have level two consciousnesses unless one possessed awareness to be organized into sets. One cannot have awareness unless one has had perceptions to organize sets. One can have simulated perceptions without having sensory inputs. However, perceptions of sensory inputs that never happened cannot be simulated. One cannot simulate the sound of a symphony if that individual has never heard *sounds* before – there has to be attributes to organize. The action of thinking is that or organizing awareness into some form of strategy or its supporting simulated perceptions. Again one should be cognizant that all these action by the brain have only one purpose and that is to enhance the probability for

maintaining the integrity of the organized structure i.e. the body and thus the brain.

Is consciousness correlated to neuronal activity? Yes. Just as a magnetic field correlates with the atomic structure of the material from which it is produced, consciousness correlates with neuronal architecture i.e., the sets of active neuronal networks, distributed throughout the brain that are activated in a temporal overlapping fashion by action potentials. The neural architecture is similar to what Crick and Koch call *essential nodes* forming the *coalition*.

Does a human infant a few days old, possess consciousness? According to the above stated theory this infant at best will have the most primitive forms of level one. However, as time progresses he or she will be receiving sensory inputs from all its receptors i.e., attributes. These sensory inputs will be received by the infant's receptors in parallel and will be the base for forming the *essential nodes* mentioned above. These *initial essential nodes* are modulated by the activity of all the receptors. Therefore, different types of initial essential nodes will emerge and will be stored, or organized in relational orders thus forming the *initial coalitions.* The function of these initial coalitions is to safeguard the integrity of the body. Therefore, these initial coalitions will differ from animal to animal. The formations of the initial essential nodes for human infants are different from infants of other species. The difference is attributable not only to the availability of their sensory abilities but also to the ambient in which they are living and developing.

These initial coalitions are what I refer to as *perceptions.* These perceptions are further organized to form a higher level of coalitions or structural substrate which constitute *awareness.* The question now is how are these sets of active action potentials organized into perceptions and awareness? The answer is very complex. Recall that Nascium, analogous to energy, *is the ability to organize.* The organization is done by something else. As shown in figure 3 the suggestion is that this is done by the actions of Primary and Secondary Controllers. However, this still leaves the question of "how is this control accomplished? Or what is being controlled?" There is a need for further research to shed some light into this and other related questions.

Following the scientific method every theory should be testable. However, when we are dealing with emergent outcomes the methodology for proving a theory has to differ from the traditional algorithms. For example: if an out-of-space intelligent being lands on the earth and picks up a computer and flies away. Suppose it had never seen a computer before but accidentally pressed the power button and an image appeared on the screen. Now it would want to know how this "object" operates. It removes the back cover and looks inside. Do you think that it will be able to understand the image on the screen by analyzing a transistor? Yet they know that if this "little thing" is removed the image is affected, it could totally disappear from the screen! So they can establish a correlation but it would be a daunting task to really find the software which produced the image in the first place! Consciousness is an emergent outcome resulting from organizing awareness (coalitions - attributes). Our process of thinking is the process of organizing awareness (coalitions - attributes) into sets which we call *Ideas.* Awareness is the level just before consciousness. For example: If I say "what's your name?" It is quite probable that just before I asked the question you were not saying to yourself "my name is …" However as soon as you obtained a sensory input directing you to certain initial coalitions where the neuronal network for your name is stored and activated by action potentials, this neuronal architecture produces an emergent outcome which we acknowledge as a feeling of comfort about your name. This neuronal architecture remains active producing the feeling of knowing your name for a possibility that you need to access your name and thus waits in an alert state to "decide" what to do next. You might have to reply: "my

name is Jack" or give a wrong name. This is a state just prior to consciousness. You become conscious of your name when there is a need for it to be used for some organizational activity, whether internally (thinking) or externally to identify yourself. Consciousness is the action which provides the internal stimuli (simulating the external stimuli) and organizes those awareness to simulate conditions which would favor your survival.

Let us return to the alien and the computer. Let us follow the process as the alien is taking it apart. The alien soon realizes that the components are organized in a certain form. However, taken alone these "things" will not explain the image on the screen. But the alien understands organization, that its emergent outcome is information. When the alien analyzes the electrical organization then we the observers know that he is getting "*warm"* and is using the right algorithm in the methodology to analyze the device and eventually will be able to discover that the electrical organization (the signal) is dynamically varying and it carries the information to affect the varying processes that produce the image, while the transistor affected a static process. Eventually the alien will discover the complexity of the electrical organization i.e. the software, and since it is not familiar with this aspect of organization it will have to use methods it has never used before. Finally after a long periods of investigations the alien will assume that there are two types of "software", one for directing internal elements (*the operating system*) and the other for directing elements (*application software*) which will produce outputs such as information (organized shadows) on the screen. The computer/alien metaphor is applicable to efforts expended to study the science of consciousness.

As we grow from infancy to childhood we build a repertoire of perceptions and awareness i.e., attributes, which will form a combination of the *operating system* with which we are born and the *applications* which we formulate as we advance in age. The innate *operating system's* main objective is to safe guard our survival and that of our *application system* is to enhance our survival capabilities as our environment changes. We have established that we are entities that must follow the principles of nascium. The theory of natural consciousness differs from that of pansychism. Nascium is a physical entity which is everywhere and could have the characteristics of dark energy/matter. Consciousness exists only when there are awareness that are being organized. However, one experiment to prove this theory could be carried out by properly developing an organizing algorithm and its appropriate software to emulate the formation of perceptions, the formation of awareness and the organization of these awareness to be stored for later use. However, the operating system of the computer has to be drastically modified to have all its actions dedicated to the organizing of sensory inputs from its environment, for the sole purpose of safe guarding the integrity of its being. When developing an operating system which will safeguard its integrity, it must consider that the parameters of the environment will change, that there will be others which MAY find it necessary to threaten its integrity, that there will be possibilities of internal malfunctions, and that there will be others like it and the second principle of nascium will apply. The developer of this algorithm has to consider that there cannot be organization without order and there cannot be orders without rules. In the case of an artificial consciousness, the maker or the rules are humans. However, the human must develop rules which fully comply with all principles of nascium. The developing of such algorithm will fall short of a complete emulation of natural consciousness because the device, the computer, will have sensors which will be of different caliber than those of humans. For example some such as tactile, auditory, olfactory, gustatory and visual can be made more sensitive than those of humans. However, these sensors exist to enhance the capability of maintaining the integrity of the human body and this necessity may not apply directly to the computer. Phenomenal consciousness and quale – An attribute, such as whiteness, which is considered to be independent from entity having the property - are derived from strategies developed

using inputs from these sensors, for example the feeling of serenity when listening to one's favorite music, or experiencing the aroma of an exquisite perfume are stimulated by the result, i.e. the outcome (awareness) of the strategies based on sensory inputs and other strategies that were developed earlier. Feelings are results of operations of neuronal architectures (recall that architectures are neuronal networks that are 'active,' experiencing action potential) and are another state of consciousness. Not all feelings are made the same way. Feelings of hunger, for example, stem from neuronal architectures that result from elements of level one consciousness. While feelings of happiness resulting from a mental realization of the probability of winning a multimillion dollars lottery, are the elements of level two consciousness.

Of the thousands of academic publications on the subject of consciousness, I do not know of any that examines the subject and provides a globally accepted theory of what is consciousness. However, there are common salient questions expressed by a great number of authors that need to be answered before an effective theory can be formulated. I have selected questions from most recent authors which require answers not provided by present theories of consciousness. The following are the most salient questions asked by A. Revonsuo (AR) (2010) in his *Consciousness and the science of subjectivity* – followed by a summarized answer based on the N*atural Theory of Consciousness*.

1 (AR) - In some theories, the nature of consciousness … and the nature of the brain … are seen as fundamentally different: made out of very different kinds of basic stuff. …. What is consciousness and how is it related to the brain?

The theory of natural consciousness states that consciousness is the product outcome of neuronal architectures being related within the brain, just like a magnetic field is the outcome of a material's atomic structure. Therefore consciousness is implicit, related to the brain just as gravity is implicitly related to mass.

2 (AR) - Do we have a clear enough idea of consciousness to approach it scientifically?

There is a strong desire by many investigators that there should be an academic approach i.e. a science of consciousness, where scientific methodologies of investigation could be applied. However, to accomplish this, one needs at least one theory which would permit the implementation of scientific methodology. Unfortunately most of the present theories of consciousness do not comply with this requirement. Perhaps the Natural Theory of Consciousness does comply. The supporting hypotheses for this theory are: a) the existence of a physical entity Nascium and b) the Neuronal Correlates of Consciousness. These two supporting foundations are physical entities, one, nascium, an anti-entropy entity, varies inversely proportional to entropy and the neuronal architectures that are biophysical entities with characteristics defined by present scientific paradigms. Nascium is the only physical entity which has not been studied yet. We defined it as the ability to organize. However, just like energy, we do not have much scientific knowledge of the nature of organizing. For example we do not yet understand the nature of the variables involved. We recognize when something is organized but we do not know much about the rules involved. We know that *time* is an outcome entity of organization. We may say that organization implies order and order implies rules and rule imply objectives. However, how are the rules derived? While a termite colony is able to produce a mound, a small number of termites are not able to "organize" themselves to produce a mound even though all the elements needed for the construction could be made available them. Therefore, structuring a science of consciousness implies structuring a methodology to study the nature of Nascium.

3 (AR) - What are our thoughts, experiences and memories made of?

Our thoughts – neuronal architectures, are the resultant of organizing awareness and selected perceptions. In this new paradigm, awareness is not a conscious state. It is the state where perceptions are grouped according to certain controls emanating from various loci in the brain, such as: the frontal lobe's cerebral cortex, the amygdala, the thalamus and possible other loci in the brainstem.

4 (AR) - What about moments of intense joy, happiness, beauty and awe, when we seem to reach a higher consciousness, full of meaning: are they only fleeting electrochemical symphonies played by billions of neurons in harmony, or perhaps glimpses of an other-worldly mental realm, entirely beyond matter?

During our development, starting at the time of birth and continuing until the slowing down of brain development, our inborn (operating system) organization function will assemble sensory inputs – from all sensory, as per their development, in parallel like the sounds of each instrument of an orchestra, into sets of perceptions. These are not just sets of neuronal architectures, but also associated physiological events i.e. creation and usage of neurotransmitter, to classify a particular set of perceptions into "desirable or non desirable." Therefore, joy, beauty, happiness, love, bliss, awe, are all sets of perceptions (stored physiological events of action potentials) which are "automatically" evoked under special state of consciousness. These stored perceptions i.e. physiological events, which were acquired during early infanthood brain development, constitutes the early memory which will be accessed throughout life. In other words, if a child had the misfortune of not being physiologically impersonal, i.e. not receiving the necessary sensory and thus not developing the necessary relational function of the memory, as an adult it would not be possible to teach this individual the feeling of, say love, or happiness, or hope, depending on the type of physiological aberrations that were present at that developmental time. Teaching someone to learn is the action of emulating the state of consciousness, on behalf of the learning individual; i.e. providing procedures of how to organize awarenesses. Perceptions are non-conscious events and we do not know how to organize or stimulate the physiological attachment. Therefore, perceptions with the attached physiological phenomenon cannot be taught i.e. feelings cannot be taught; at best the learner can only emulate them by associating these new stimulated events with other early acquired perceptions.

5 (AR) - How could we find out what it is to be like another conscious being?

This is not possible. Consciousness is the outcome of physiological events. It is not the event nor, is it the components that make up the event. The actions of "finding out" or "what is it like" are attributes of consciousness and "one consciousness" is unique. The question is of the same type as that of "can an eye see itself?" Kurt Godel proved it mathematically through what he called "the incompleteness theorem." that is not possible to do it. A more meaningful question would be: "As an observer, what is it that I need to know to be certain that the entity that I am observing has consciousness and at the moment of observation is in a state of consciousness?" I have a preliminary answer which is: if it is evident that the observed entity is able to organize then this entity is in a state of consciousness. However, one could have a robot which could perform organizations. But if a totally new situation is presented to the robot for which programming was not anticipated and the robot invents a decision making process which provides effective organization, can one say the robot has consciousness? I think a much more rigorous examination of organization and perceptions and awareness has to be developed before effectively answering this question. Therefore, for a more detailed answer I will leave it for the time when the science of consciousness has developed adequately and appropriately.

6 (AR) - What is … our consciousness ultimately made of? Is it physical or non physical? How does the subjective psychological reality relate to the objective physical reality?

Consciousness is the outcome of the action of organizing neuronal architectures. It is not made of something, but is analogous to the image on a television screen or a computer screen. The images are caused by controlled and directed electromagnetic energy. As this energy passes through the final outcome a "transfer function," it becomes an image on a liquid crystal display system. The image and its formation are what are analogous to consciousness. The third part of this question deals with the two aspects of consciousness assumed by a great number of investigators. These attributes, they argue, are not elements of consciousness but of the observer – but what is "the observer" without consciousness? The Natural Theory of Consciousness proposes two levels. However, these levels are attributes of consciousness not of the observer. The reality for consciousness is the physical one. All other manifestations of consciousness are related to the strategies for maintaining the integrity of the entity it requires for existence; in other words, the first and second principle of the theory of nascium. With respect to the second part of the question of whether it is a physical or non physical entity, the answer is neither. It is analogous to wondering if the geometry of a triangle is a physical entity or not.

7 (AR) - How could we decide whether computers, robots and perhaps some of our fellow humans are really conscious beings or only nonconscious zombies?

This is a very difficult question to answer at this time. It requires that the science of consciousness be further developed. We need to understand the variables that are essential for organization and the relationship between these variables. Are these variables the same with the same characteristics as those for order? And what are the relationships between these variables and the rules applicable to order? These are attributes pertaining to the comprehensive understanding of consciousness. The other aspect of the question deals with the fictitious characters or "zombies." These in reality cannot exist according to the theory of natural consciousness because they are not functioning to create order, neither do they obey the first or second principle of nascium. Although one could consider them as the negative aspect of nascium. However, further development of this theory during the process of developing the science of consciousness could provide a model for the negative aspect of nascium.

8 (AR) - What kind of stuff is the universe ultimate made of – is it entirely composed of physical matter or is there something else besides?

This is the crux, the foundation, the essence of the understanding of consciousness. We humans are able to understand what we understand of the universe because we have consciousness. Therefore, do we exist so that we can manifest consciousness? Or should I rephrase this question thus: does an entity exist so that consciousness can manifest itself? To effectively answer this question we have to consider our knowledge of the universe. What is the universe made of? Why does it exist? What are the rules that made it? What order is it following? Who made the rules? These questions bring to an new physical reality, a new paradigm I call nascium. The answer to the above questions must satisfy every system of reference used to explain them. The Natural Theory of Consciousness states that existence has three elements. Energy – as the ability to do something. Nascium – as the ability to organize this something, and the resultant Matter – the organized entity. These are the three fundamental elements of the universe. Nascium is the new player in the field.

9 (AR) - Therefore, a fresh start is required in order to scientifically focus on the subjective stream of experience, or consciousness itself. But what exactly is such a science all about?

I am proposing a new paradigm, the "Natural Theory of Consciousness" as "the" required fresh start. Furthermore, I argue that this theory is adequate "to scientifically zoom in on the 'subjective' stream of experience or consciousness itself." The science will be about organization, order, rules and variables and their relationships. If someone who has never had a notion of a computer screen, views a screen presenting the Japanese spring time through a cherry tree field, attempts to understand those images, he will find his efforts not very effective if this individual only concentrates on analyzing the LCD.

The next set of questions are taken from Chapter 2 – The neurobiology of Consciousness, Christof Koch (CK) of the book *Consciousness, Awareness, and Anesthesia* edited by G. A. Mashour (2010)

1 (CK) - Why is there any experience at all? Or, put differently, why does a brain state feel like anything?

According to the first principle of nascium, an organized entity will tend to stay organized unless a greater force causes its demise. The environment in which this entity exists is treacherous but vital to its integrity. There are many such organized entities. However, the ability to maintain this organization varies from species to species and from individual to individual. Certain entities, such as organic entities have a more complex organized structure and thus their ability to maintain their integrity depends on some innate strategies, while other organic entities have the capacity to formulate some very primitive strategies. However, the caliber of the strategies becomes more and more sophisticated as we move from simple to complex organisms. The feelings or the experience are the formulation of these strategies. The entity needs them to comply with the first and second principle of the theory of nascium, since these strategies are either to maintain the integrity of the entity i.e. strategies to attract or want, or to safeguard the integrity of the entity i.e. producing strategies to defend, protect, avoid, etc..

2 (CK) - Why is the relationship among different experiences the way it is?

As mentioned above, experiences are the actions of bringing forth into consciousness awarenesses. The relationships between experiences are reflections of the differences between awarenesses. Each awareness is the organization of perceptions according to certain order. These perceptions are related by the level of risk or benefit to the strategy of safeguarding and nurturing the integrity of the entity.

3 (CK) - Why are feelings private?

Feelings are private because perceptions, awarenesses and the formulation of strategies are all unique to the individual.

4 (CK) - How do feelings acquire meaning?

Feelings are expressions of perceptions and or awarenesses. Meanings are the outcomes of comparing perceptions or awarenesses, either self stimulated or simulated through the state of level two consciousness or brand new sensory inputs which are internally organized to form perceptions which are associated with other perceptions already registered i.e. stored.

5 (CK) - Why are only some behaviors associated with conscious states?

According to the Natural Theory of Consciousness, there are only two states that constitute the domain of consciousness. One state is called level one and the other level two. Level one has the objective of reacting to the safeguarding of the integrity of the entity with consciousness, complying with first principle of nascium. Level two has the objective of formulating strategies for complying with all the

principles of nascium. Whether the entity is awake or dreaming these principles have to be obeyed. When a "near death" experience occurs there is an interruption to the necessity of obeying any of the principles of nascium. This interruption could be caused by physiological conditions. Advancement in the science of consciousness would provide more cogent and detailed explanations of the nature of maintaining the structure of an organization.

Consequences of the new paradigm:

The paradigms used to understand consciousness are not providing the necessary attributes to explain and define the mental state that we call consciousness. Present paradigms allow the use of words such as *perception* and *awareness* as synonyms for consciousness. Our thinking forces us to conclude that we have to employ a new paradigm. Our proposed theory of consciousness confirms the majority veiw that consciousness is an outcome of neuronal processes. These processes are neuronal networks which their nodes, i.e. the cells, can be in a state of undergoing action potential activity, or in a passive state where action potential is not present. For operative purposes, we are separating the concepts of network and architecture. We termed neuronal architectures, when the nodes of the network are undergoing action potential. When the nodes are not in a state of action potential, we just refer to the set as neuronal network.

We postulated that sensory inputs will initiate neuronal architectures which we called these sets *perception*. However, this organization of sensory inputs is further organized into relational sets of neuronal architectures. These larger sets of neuronal architectures we termed them *awareness.* For example, if the sensory inputs – *perceptions* - are: from auditory, sounds as "don't touch"; from sight, red elements; from skin, heat; from previous sensory - responding to "don't touch" - promoting motor action. These related *perceptions* form *awareness.* The process or organizing the relationships between these neuronal architectures generates the genesis and life of consciousness. Since action potential is of relatively short duration, the duration of consciousness is the duration of the number of neuronal architectures that are manifested at a specific time. We postulate that although these nodal action potentials do not have to be synchronized, within a neuronal architecture, they have to occur within the time span of the duration of an action potential. In other words they have to be overlapping. Our consciousness is the outcome of the integration of the activities of sets of neuronal architectures. The mental state in which these neuronal architectures are inactive is the state of unconsciousness. A human being under the influence of anesthetics is under a chemical condition which causes switching (and or deactivation) from neuronal architectures into neuronal networks.

The function of consciousness is that *of organizing* the sequence of neuronal architectures. Within the neuronal network with its billions of nodes, how are these architectures organized? The theory states that these sets of networks/architectures are established during embryonic and infant development through stimulation by sensory inputs. What is the nature of these *organizations?* And what is their purpose? From a physiological perspective, there has to be a *controller* perhaps distributed throughout the thalamus, hippocampus, amygdala, other loci of the brain stem and the cortex of the frontal lobe. But the essential question still remains; why organize all these sensory inputs into several groupings? I argue that the theory of "self-organization" makes sense if there is a "self" which has the capacity to organize. It is what I call NASCIUM. One must consider that organizing implies order. I cannot imagine order without considering rules. However, rules also imply objectives. Therefore, the reason why organization occurs is to maximize the effectiveness and efficiency of the first principle. Which states that: "an organized entity, by virtue of its structure, is compelled to maintain the integrity of its architecture – self preservation."

The proposed new paradigm, i.e., nascium, has numerous implications. One of these is implication of

the nature of *time*. Given the postulated existence of a physical entity -nascium - which has the capacity to organize, we can consider the meaning of organizing as a quantum activity performed in an orderly way. These quanta *are the elements* of time. For an observer time is the duration of a unit of consciousness. Therefore time is a relative unit dependent on the "distance" between A and B. where A is the essence and B the caesura of an activity. If there is only A then there is no time. Feelings are a state of mind where time does not exist.

Another implication is the way we understand consciousness. In the new paradigm, consciousness is an outcome of organizing awarenesses; awarenesses are organized sets of perceptions; and perceptions are organized sets of sensory inputs. Since organization implies rules and rules imply objectives, the objective of human consciousness is to comply with the first and second principles - the process of renovate itself by procreation balanced by senescence and death - of nascium . With this in mind it is feasible to formulate a preliminary algorithm where one could write a software program which could emulate consciousness i.e. produce artificial consciousness.

[1] - In the "natural theory of consciousness" Understanding means – A set of awareness and or perception which when brought together into consciousness will cause an acceptable – an agreeable sensation – neuronal architecture.

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