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The Parameters of Temporal Correspondence in a Continuous State Conscious Universe

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“And as imagination bodies forth the form of things unknown, the poet’s pen turns them into shapes, and gives to airy nothing a local habitation and a name”. W. Shakespeare

“The distinction between past, present, and future is an illusion...”. A. Einstein

1. INTRODUCTION

Clock time can appear absolute in the classical Newtonian sense or relativistic for accelerated observers. The perception of time is coupled to dynamical processes often associated with entropic flow; but entropic time does not correlate with clock time. And clock time only correlates with psychological time for certain states of consciousness. If a process is harmonic or occurs at a microscopic level where the laws of physics are temporally symmetric all conception of time can be lost; thus the nature of time has maintained itself as a dilemma for millennia.

In this chapter Einstein’s notion of eternal time in a static universe will be extended to develop a framework for correspondences that unify all aspects of time within a new cosmological model called the continuous state conscious universe (CSCU)¹¹. Within the CSCU framework human existence is composed of a two-fold complementarity; a Cartesian type body/mind dualism comprised of a *res extensa*, and *res cogitans*⁶. The component associated with the body (obeying Fermi-Dirac statistics) is governed by classical dynamics, the rules of general relativity, and imbedded in a curved 3 (4)-D Minkowski-Riemann spacetime. The latter component

(obeying Bose-Einstein statistics) is governed by the laws of special relativity and imbedded in an 'eternal' locally flat 11 (12)-D higher dimensional space that mediates a *vis vitae* or *elan vital*¹⁹ through action of a teleological principal inherent to the unified noetic field originating nonlocally in a 'supralocal' domain.

There is not simply 'one nonlocality' as most physicists assume. Nonlocality (NL) has a manifold structure comprised of a NL-I - Spacial Nonlocality, NL-II - Temporal Nonlocality & NL-III - Unitarity; each component of which has a different structural-phenomenology³⁸. The putative supralocality is coupled to NL-III except that it has domains that are not causally connected to our 10 (11)-D 'virtual reality'. (See Figure 8)

A complete description of this structural-phenomenology can not be done adequately from within the domain of the current standard models; and demands elaboration from the point of view of extended physical theory and embracing currently unpopular philosophical constructs like vitalism and teleology. An understanding of the nature of time is an essential part of the extended theory⁴⁷ and will shed additional light on the nature of gravitation, including the contrast between determinism and free will. This is why a description of the CSCU is a required precursor. Within the CSCU context it is possible to present a comprehensive model of the nature of the origin of time, life and mind for the first time. In addition this ultimately entails describing vacuum scale gravitational theory and completing quantum theory by integrating non-collapse evolution of the wave function by introducing an additional weak causal principal of consciousness which the current Copenhagen interpretation does not include.

Time is inexorably connected with space in the entity spacetime, which is not fundamental, but in which "We" and the properties of all matter we perceive is imbedded. It is the properties of this matter, that our awareness is imbedded in also, with which we define the measuring rods that are the fundamental basis of all physics³². To understand the nature or foundations of time we must be able to comprehend more fully the nature of space. As Einstein obviated the absolute space of Newtonian mechanics; we must now obviate the classical basis of measurement used up to this point in the history of empiricism, and in the process obviate and reformulate the whole fundamental basis of physics itself. It is mandatory that a new scientific methodology be devised to investigate the 'absolute noumenon of existence' that resides behind the 'facade of phenomenological reality'. If scientists are finally ready to open this Pandora's box?

2. REALITY AS ILLUSION

‘While walking across the campus lawn toward the UC Berkeley physics library absorbed in thought, an intrusive sound caused me to raise my head. In front of me was a pick-up truck; I *heard* the engine running. Two steps later, with a new parallax, the sound separated into components. A few meters away toward the right was a drain making the gurgling sound of underground water running into it. After another step a second sound component separated. Rectilinearly 500 meters away, up a few stories in a construction site, the wine of an electric drill emanated. I looked at the truck again; the engine was not running. The two sounds combined, plus the fixation of my sight on the truck, produced the completely accepted “real” but illusory experience in my “minds eye” of a truck’s engine running!

It is suggested that our fundamental awareness is comprised of base states^{5,6,9,10} imbedded in spacetime that evanesce into our perceived reality in a manner similar to the above serendipitous experience. This concept was described anciently in Plato’s ‘analogy of the cave’ as shown in Figure 1. More recently: “Time and space are modes by which we think and not conditions in which we exist.” - Albert Einstein, 1941. The physical nature of our mind and apprehended reality are a summation or superposition - a complex hyperdimensional ‘standing wave’ of spacetime and consciousness base state components comprising both our temporal existence and physical nature of our temporal awareness. This premise is taken as the starting point for our discourse.

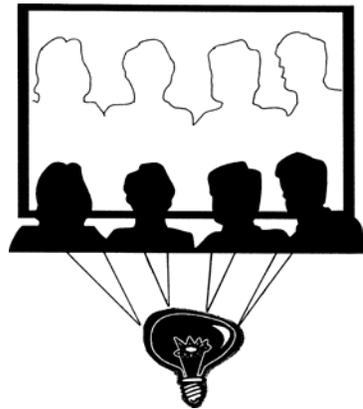


Figure 1. The ‘facade’ of sensory reality. For millennia scientists, philosophers and theologians have considered reality as a perceptual illusion; a limited phenomenology of observation imbedding us in the material comprising it. Plato said ‘that reality is as if we are in a cave chained up facing a wall viewing events by the light of a fire projected from behind never knowing the true nature of existence. If we were released to turn toward the light at first

we would be blinded by its brightness still having our perception clouded.' Finally scientists seem ready to solve this paradox - that the basic assumptions and all the empirical measurements forming the foundation of physical theory are not fundamental, but based on an illusion of perceptual phenomenology that our existence is structurally imbedded in. This requires new Physics and Cosmology defining time and how our perception is involved in the parameters of spacetime.

But obviating all of physics is not to discard it; the falsification of Newtonian mechanics for example merely relegated it to its absolute domain. By obviating 'reality' science defines the classical limit and prepares to describe a new framework redefining the physical world and creating the formalism and additional experimental methods needed to study the 'noumenon' of the universe beyond the 'illusion'. In this chapter fundamental parameters of the cosmology that our awareness is imbedded in are outlined. It appears that it will not be possible to comprehend the nature of space, time or mind until this task is adequately underway.

3. PHILOSOPHY OF MIND - THE HARD PROBLEM

The study of awareness has been recently classified as a 'hard problem'; with the easy problems of awareness being ones that are nearly impossible to research²³. The nature of mind has been called the oldest and most difficult problem facing human epistemology. It is only recently that a framework for posing the question of the nature of mind is reaching sufficient maturity^{5,6,7}. Chalmers' initial premise that awareness is the fundamental principle from which to formulate a theory of mind²³ is a reasonable assumption; but going on the ask: 'what processes in the brain give rise to awareness?', creates the 'hard problem' because this manner of posing the question represents a category error for philosophy of mind. Historically whenever there has been a hard problem in science, it has turned out to be because the underlying principles have been poorly understood. Although it has been postulated that the mind/body is a naturally occurring form of conscious quantum computer; mind is more than brain or algorithm^{5,7} and it is impossible to formulate a correct or sufficient theory of awareness from the point of view of AI, computer science or neuro-biology alone. Mind, to be adequately described, must be represented by a complete cosmology with mankind imbedded in it^{5,6,9,10,12}. Currently about 93% of scientists believe the brain is sufficient to model the human mind.

4. PHILOSOPHY OF MIND - VITALISM / TELEOLOGY

The Continuous State Conscious Universe (CSCU) insists on reintroducing concepts like vitalism and teleology that have been historically disdained by science. Mechanistic models of the universe have had no place for these 'philosophical constructs' considered non-physical even by their proponents. In the CSCU they become physicalized and thus subject to falsification by empirical methods.

Teleology is the philosophy based on the supposition that the universe has design and purpose beyond the mechanics of a Newtonian or Big Bang universe driven acausally by a Darwinian type of natural evolution. Evolution obviously exists, but is guided by a teleological quantum of action inherent in the supra-locality of the CSCU. In perennial philosophies, teleology represents a basic argument for the existence of God, that the order and self-organization of the natural world are not accidental. If mind is fundamental to existence, an ultimate designer or teleological principle exhibiting a quantum of action must exist.

Modern teleologists like Hans Driesch or Henri Bergson proposed a principle of *vitalism* - that the processes of life result from, i.e. a self-determining fundamental rule not explicable by currently observed physiochemical laws. Bergson proposed an *élan vital* or vital force¹⁹ as the spontaneous energy of the evolutionary process and defined the mind as pure energy, responsible for all organic evolution; and denying the claim of science to explain the universe on purely mechanical principles. In ensuing sections this *vis vitae* is shown to be physical and discussed in terms of the noetic field^{9,10}.

5. PHILOSOPHY OF SCIENCE

In Newtonian clockwork mechanics consciousness was irrelevant or nonexistent. The advent of quantum mechanics introduced a troublesome observer involved in measurement. Although highly successful quantum mechanics has been deemed incomplete and does not describe biological systems suggesting that additional theory is required. The additional theory must describe the fundamental nature of time and include consciousness.

Traditionally five arrows of time^{27,43} have been described:

- THERMODYNAMIC: The observation of temporal asymmetry in thermodynamic processes represents the most important arrow of time because it provides all of our phenomenological experience, and the

- existence of biological activity. Irreversible processes move toward a thermodynamic equilibrium of maximum entropy.
- EXPANSION OF THE UNIVERSE: Distinguishes between a past and future in the evolution of matter in the universe. In the CSCU this arrow of time has no fundamental significance because it is an observational illusion proposed by an incorrect interpretation of astrophysical data¹¹.
 - ELECTROMAGNETIC: It is generally observed, which leads to the belief that all electromagnetic waves propagate into the future only. However this is not necessarily true in interpretations of the transactional/absorber theory of radiation^{26,54}, and represents a component of the illusion represented in Figure 4¹¹. This is consistent with Maxwell's equations which are symmetrical in time.
 - KAON DECAY: Nuclear reactions may occur in either direction with one exception occurring between elementary particles that are not part of ordinary matter - Neutral Kaons. There are three kinds of K meson but only the neutral Kaon exhibits a temporal asymmetry. Because neutral Kaon decay asymmetry is a spacetime property not associated with ordinary matter its description can be formalized into evidence of the supralocality of CSCU³⁹ by illustrating the variation of decay paths in terms of gravitational coupling to spacial and temporal nonlocal spacetime spin-exchange dynamics.
 - PSYCHOLOGICAL: The subjective flow of time that reveals to our moment by moment experience that all actions flow from the present into what we define as the past. The contrast between the four arrows of time defined by physical laws and the subjective arrow of time has led to the belief that time is an illusion.

Currently physicists describe: 1. Physical time and 2. Psychological time separately, both of which are incompletely understood. A major premise of this work is that all five arrows of time are an illusion related to the phenomenology of mind and consciousness. But because mind in the CSCU is completely physical; all the arrows of time are likewise actually 'physical' and can be investigated with new experimental methods leading to discovery of the teleology of the noetic field. The unitary nonlocal noetic field couples classical dynamics and general relativistic effects in a complementarity through the pathways of neural dynamics. This is directly responsible for the perceived arrow of time because this matter-spacetime medium is what 'we' are made of and 'imbedded' in. The noetic timeless domain is the entry point of awareness that couples 'eternal time' through special relativistic dynamic transformations independent of classical gravitation to temporality.

6. THE STANDARD MODEL

While the nature of Minkowski/Riemann spacetime described by the Einstein 3-sphere is one of the most profoundly elegant descriptions of modern physics, and according to relativity theory “All methods lend themselves to the measurement of the curvature by experiments performed within the manifold, that is, with no need whatsoever to speak of an embedding of the manifold in a higher-dimensional space”⁴¹; the fact remains that relativity theory and quantum theory provide an incomplete description of the cosmology of the universe. While parallel transport, and the boundary of a boundary principle²² being zero in the Bianchi identity as described by the Regge calculus seem to make the postulate of general relativity clear in terms of Miller’s quote above; this is still an incomplete description, not describing conditions completely at the Planck scale or beyond the observed Hubble sphere.

The orientation of the zero boundary conditions through the 2nd law of thermodynamics provides the arrow of time for the Einstein 3-sphere causing our phenomenological reality to evanesce so to speak with apparent independence of the rest of the hyperdimensional structure beyond the Einstein description that contains it. Although this conceptual framework might seem fantastic in light of current thinking, let’s try to clarify it. Firstly, the universe in the coming ‘new gravity’ does not reduce to a scalar Planck surface of compactified additional dimensions. The realm of our perceptual reality is the reduced space; our current conceptualization is thus reversed. An initial element of the new theory,¹⁴ Spin Exchange Compactification shows that the so called higher dimensional complement is continuously compactified in time only, not in the higher hyperstructure where they remain fully extended. The purpose of these higher dimensions then, relative to our semi-collapsed reality is to provide a template for temporality to ‘surf’ on the face of ‘eternity’ through a continuous hyperdimensional translation of the extra dimensions or those excluded from our perception. We are ‘flatlanders’¹ to the complete nature of the universe. This leads to an ‘eternal continuous state universe’¹¹ with a broader continuum of temporal Hubble spheres co-moving within and without each other. In this harmonic transform there is rather than a reduction to a scalar Planck vacuum a continuous rotation into our collapsed phenomenological present of a transformation of the 1. classical, 2. quantum and 3. unitary as this present state is created, annihilated and re-created out of the future-past. Our reality ‘surfs’ within the arrow of time by the 2nd law of thermodynamics and action of the noetic field. In the ‘gaps’ between the present-future/past and next present-future/past moment (like the spacing between frames on a film) the actions of the higher ‘complete’ 12D hyperstructure takes place. Thus the

constant c of the speed of light is inexorably connected to this spacetime/eternal transform and provides Earth with its proper time and us with mental clocks. The zero boundaries of the Einstein hyperstructure interface with the zero boundaries of the super-hyperstructure allowing them to interface and transform one within the other, with apparent chaotic stochasticity to our phenomenology and with perfect unity to the superstructure. The stochasticity and quantum uncertainty provides a perceptual phenomenological gulf between the two.

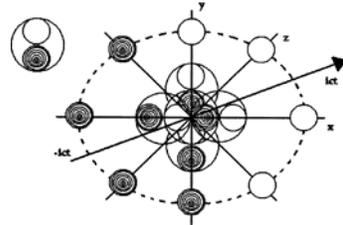


Figure 2. A 4-sphere of dimensions $\Delta x, \Delta y, \Delta z, \Delta t$ partially separated at the center and its eight 3-sphere faces depicted as ‘exploded off’ of it. The exploded faces suppressed from the small figure at left. “The fourth-dimensional globe... is best indicated by circumscribing the numeral 8 inside a circle. So three circles are formed, the lower one representing the initial globe, the upper one representing empty space, and the greater circle circumscribing the whole. If it now be understood that the upper circle does not exist and the lower (small) circle is identical with the outer (large) circle...”(57). In reality a single hypersphere does not exist independently. If we consider the upper white circle that Ouspensky calls empty space and non-existent in terms of the Wheeler - Feynman - Cramer - Chu absorber theory of radiation in the light of the boundary of a boundary being zero, these so called empty spaces are conceived as orientations of the h-sphere in the unrealized future null direction.

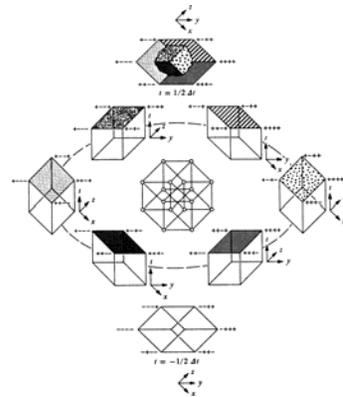


Figure 3. “A 4-cube of dimensions $\Delta x, \Delta y, \Delta z, \Delta t$ and its eight 3-cube faces depicted as ‘exploded off’ of it. The content of the stress-energy tensor in the 3-cube at the upper right (shaded only at its ‘top,’ with diagonal stripes) measures the amount of

momentum-energy that passes out of the 4-cube across a surface area $\Delta x \Delta y$, located at $z + \frac{\Delta z}{2}$, during the time Δt . To demand conservation of momentum and energy in all eight cubes, taken with due regard to sign, shall add to zero. This demand is fulfilled by representing the amount of momentum-energy in the given 3-cube (a vector or, in its dual representation, a 3-index tensor) as a sum of the 'moments of rotation' associated with all six 2-dimensional faces of that 3-cube. When we add up these contributions for all eight 3-cubes we have $6 \times 8 = 48$ 2-dimensional faces to deal with, but their contributions all cancel out in pairs, as required. Thus the contribution of the striped face just considered is canceled by the contribution of the striped face at the 'top' or $\Delta x \Delta y \Delta z$ 3-cube. This is the payoff of the principle that the '2-dimensional boundary of a 3-dimensional boundary of a 4-cube' is zero. This is how spacetime grips mass so as to ensure and enforce the law of conservation of momentum and energy."

The new CSCU model of the universe requires 3 hyperstructures like the Minkowski/Riemann Hubble 3-sphere to maintain itself. So while the profundity of the Minkowski 3 (4)-D structure of a boundary of a boundary canceling to zero through parallel transport²² of the Bianchi identity formulated by the Regge calculus as described by general relativity remains astonishing, the putative new superstructure must seem more fantastic by comparison since it challenges many of the well established principles of contemporary physics and cosmology. But it is logically consistent, and its explanatory power elegant. Its apparent antithesis with empirical evidence is one of interpretation only, not in antithesis to the data! The initial 'pin popping the balloon' of current thinking arises with the application of nonzero restmass photon anisotropy^{13,14,39}. For example if photons couple to vacuum zero point energy during propagation then the perceived Hubble redshift does not signify a Doppler recessional velocity from an initial temporal singularity. It is a task beyond the conceptual presentation of this chapter to rigorously delineate the premises introduced; our purpose is merely to introduce the conceptual framework and leave the other issues to a future technical works.

7. THE GALLILEAN, LORENTZ/POINCARÉ GROUPS OF TRANSFORMATIONS

Relative to our perception the universe is locally and globally an isotropic homogeneous 3-dimensional continuum; and other than the force of gravity there is no preferred direction. Simultaneity depends on the causality of the clockwork nature of events. This is the Gallilean group of transformations given by $x' = x + vt$, with the Euclidian metric $\Delta l^2 = \Delta x^2 + \Delta y^2 + \Delta z^2$ where space and time are separate and absolute. The postulates of special relativity changed this - with simultaneity becoming dependent on the state of motion of the observer breaking down the absolute

invariant separation of space and time producing a 4-dimensional continuum where physically equivalent observers become related by the well known group of Lorentz-Poincare transformations:

$$x' = \frac{x - \beta ct}{(1 - \beta^2)^{1/2}}, \quad y' = y, \quad ct' = \frac{ct - \beta x}{(1 - \beta^2)^{1/2}}, \quad z' = z \quad (7.1)$$

With $\beta=v/c$, c the speed of light and velocity v along the x axis and t and t' not identical. The symmetry group is defined by the point set

$$c^2 t^2 - x^2 - y^2 - z^2 = 0 \quad (7.2)$$

which by a Lorentz transformation maps into itself producing the light-cone of the invariant Minkowski 4-dimensional

$$\Delta s^2 = c^2 \Delta t^2 - \Delta x^2 - \Delta y^2 - \Delta z^2 \quad (7.3)$$

spacetime where every observer related by a Poincare' transformation has the same global spatial geometry extending to all of spacetime and physical events within the geometry have no effect on the geometry.

It is general relativity that allows matter to effect the geometry of spacetime; the Minkowski frames are local and

$$G_{\mu}^{\nu} = -8\pi k T_{\mu}^{\nu} \quad (7.4)$$

the curvature disallows its global extension. The geometry is governed by the 10 components of the Riemann curvature tensor relating to the distribution of matter and ensures that the lightcone structure has local Minkowski spacetime properties which is a solution to Einstein's equations.

8. GAUGE THEORY AND HIDDEN GAUGE INVARIANCE

It has long been considered that gauge invariance also called local phase invariance, must be associated with a massless gauge field. In QED this is the photon field A^{μ} . As generally known the gauge field allows the phase of all particles to be altered independently at widely separated spacetime points. The gauge field acts as a potential; and the relationship between the mass of the quantum and the range of the potential force leads to the conclusion that the gauge fields action over arbitrarily large spacetime distances must be

considered an infinite range requiring gauge quanta to be massless¹⁵. Aitchison and Hey go on to show how masslessness for gauge quanta is rigorously linked to gauge invariance. First by showing that the electromagnetic potential satisfies the Maxwell equation

$$\square A^\nu - \partial^\nu (\partial_\mu A^\mu) = j^\nu \quad (8.1)$$

where $\square \equiv \partial_\mu \partial^\mu = \partial^2 / \partial t^2 - \nabla^2$ is the D'Alembertian operator for spin-0 bosons; and is shown to be invariant under the gauge transformation

$$A^\mu \rightarrow A'^\mu = A^\mu - \partial^\mu \chi \quad (8.2)$$

Finally, if A^μ represented a massive field, the resultant

$$(\square + M^2) A^\nu - \partial^\nu (\partial_\mu A^\mu) = j^\nu \quad (8.3)$$

is not invariant in terms of (8.2) because the introduction of the mass term $M^2 A^\nu$ breaks the gauge invariance¹⁵.

In spite of this solid argument for non invariance by the introduction of mass terms it is possible for gauge quanta to acquire mass and not lose gauge invariance if the gauge invariance is hidden and the mass has a special relationship with its couplings¹⁵. Anderson showed that gauge bosons can only acquire mass if the symmetry is hidden.

The path to hidden gauge invariance is long and tedious and remains controversial. In depth discussion can be found in the literature; it is our purpose here to assume hidden gauge invariance that doesn't violate standard gauge theory and discuss the interesting consequences for cosmology and reduction of the wave function in ensuing sections.

9. THE COSMOLOGY OF A CONTINUOUS STATE CONSCIOUS UNIVERSE (CSCU)

It is assumed that the fundamental nature of time cannot be understood from within the current standard model of a Big Bang Universe and the conceptual foundation of physical theory needs to be "Godelized" beyond it. Quantum Theory is the cosmology of matter and radiation that superceded Newtonian classical mechanics. Matter is imbedded in spacetime and it is also assumed that time asymmetry is more fundamental than quantum theory⁵⁶; and that time emerges from a more fundamental unitary domain¹⁶. The two main pillars of the Big Bang are based on the properties of light -

that of the observed Hubble redshift and the Cosmic Microwave Background Radiation (CMBR).

The CSCU is based on extended electromagnetic theory (EM) where the photon has additional longitudinal degrees of freedom and mass anisotropy¹⁴. This means that the observed Hubble redshift is not Doppler but arises from coupling of the photon to vacuum dynamics during propagation. This is the Vigier theory of ‘tired-light’. Likewise the CMBR in CSCU did not originate in a primeval explosion but occurs continuously as a black body radiation in spacetime gravitational cavity dynamics^{8,13}. The details of which are beyond the scope of this chapter and are discussed elsewhere¹¹.

The higher ‘extra’ dimensions were not compactified in an initial big bang singularity, but are continuously compactified and recompactified in a spin exchange process relative to our perceived reality in a process which creates the physical nature of the ‘illusionary’ arrow of time. Further properties of the CSCU are reminiscent of Kant’s antinomy of spacetime which he proposed as a solution to the argument between Newton and Leibniz as to whether the universe was open or closed. The observed Hubble radius Einstein 3-sphere of our perceptual reality is closed and finite temporally; but is open and infinite atemporally. Thus the CSCU is like an 11(12)-D hyper Klein bottle with an infinite number of Hubble type spheres nested within it each of which might have a variance of the laws of physics³⁹. This is consistent with extended Everett/Bohm modeling and the Wheeler/Feynman/Cramer/Chu transactional many worlds theories^{26,33,54}.

The 12 Dimensional CSCU is comprised of three 3(4) sets of Einstein/Minkowski/Riemann spacetime packages consisting of a complement of three temporal dimensions. 8(9) of the 12 dimensions are nonlocal or ‘hidden’ at any momentary slice in the standing wave of spacetime. This is represented conceptually in Figure 9.1. Here spacetime does not reduce to Planck scale compactified dimensions as in the current reductionist standard model. In CSCU cosmology our Minkowski/Riemann space is a subspace imbedded in the higher complete twelve dimensional space. The continuous harmonic translation of the symmetry of these canceled (boundary of a boundary equals zero) boundary conditions (relative to our perception) allows nonlocal contact of aspects of the Minkowski/Riemann 3(4)-D hyperstructure within the ‘perfect’ 11(12)-D hyperstructure to be ‘invisible’ to our phenomenology (because boundary of boundary equals zero) and to contain and sustain it.

**DEEPER ASPECTS BEYOND THE STANDARD MODEL
INHERENT IN THE DUALISM OF QUANTUM THEORY**

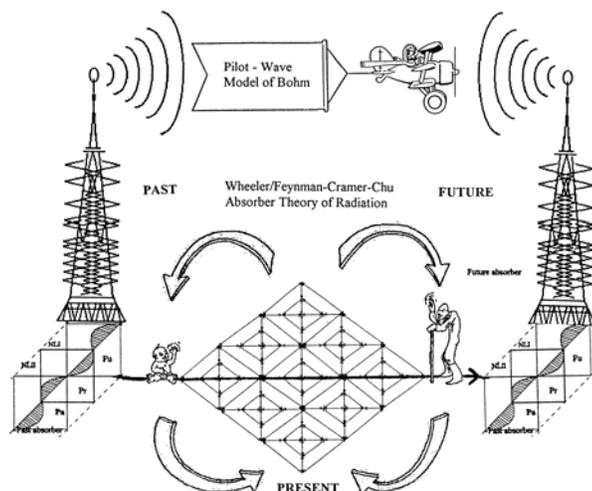


Figure 4. The quantum field of information may be compared to a ship on automatic pilot guided by radio waves from the future and the past. In addition to the local/nonlocal standard model of quantum theory; a deeper nonlocal/unitary ontological aspect suggests that a quantum dualism is required for a complete quantum theory. The ontological domain is described by a combination of the Everett/Bohm Pilot wave non-collapse version and the Wheeler/Feynman Cramer/Chu transactional-absorber theory of radiation. In this model the present collapses from a higher dimensional hyperstructure continuously recreated out of the energy of the future-past. The pilot-wave quantum potential has a relationship to causality. Gravitational tidal effects regulate aspects of quantum state evolution U and state vector reduction R in both collapse and non-collapse domains of the quantum dualism. This cosmological spacetime structure is an important aspect of the conscious universe; and is required because the standard model of quantum theory is not sufficient to describe the mind. It is through this deeper structure that the Noetic field enters the body and there are enough degrees of freedom for reason to operate. In the figure much of the hyperstructure is suppressed to give a 2D view. The three 3(4)-D spacetime packages are spread out from left to right across the figure. The central unit labeled the present in terms of our 'reality' consists of a superposition of all three in a dynamic hyperdimensional 'standing wave'.

Time is considered a structurally incomplete aspect of our perceptual phenomenological reality. While geometrodynamics is sufficient to describe coordinate free particle paths in terms of the Bianchi identity and parallel transport around a closed curve; as is well known general relativity does not provide a complete description of gravity. As will be described the additional 3(4)-D packages are necessitated by the introduction of sub-millimeter gravity and the cosmology of consciousness.

10. THEORY OF MIND

Noetic field theory^{5,6,9,10} suggests that the mind $|\psi_M\rangle$ is a state with quantifiable superimposed properties. This phenomenology/noumenon of consciousness is composed of three integrated base states: Elemental intelligence $|\psi_e\rangle$, Cosmological ordering principle $|\psi_c\rangle$, and the brain defined as an apparatus $|B|\psi_M\rangle$.

The base states of mind interact at the quantum and nonlocal levels as described conceptually in equation 10.1 or as the summation represented in

$$|\psi_M\rangle = |\psi_e\rangle + |\psi_c\rangle + |B|\psi_b\rangle \quad (10.1)$$

$$|\psi_M\rangle = \sum_i^{Z^{\alpha} \bar{Z}^{\alpha}} N_i |\psi_i\rangle \quad (10.2)$$

equation 10.2 where N is the superimposed base states summed over a prespace twistor singularity (Nonlinear aspects appear on expansion).

The domain for sensory phenomena, mentation, and all noumenal conscious processing is called the 'psychosphere'. The structure of the psychosphere is the complex bound containing the totality of individual consciousness and the extent of its influence. This means both locally in the brain and body fields, and nonlocally in prespace. The psychosphere includes a higher dimensional hypersphere or tesseract for nonlocal interactions. This is the domain from where coherent Bose psychons condense. Once it is realized that there is more to mind than brain or algorithm a comprehensive theory of consciousness can be formulated in terms of a continuous state conscious universe (CSCU). The mind is comprised of three base states: 1. Classical and quantum brain dynamics, 2. A nonlocal elemental intelligence that serves as an atemporal boundary condition of individuality and 3. The interaction of the nonlocal noetic unified field that integrates the duality^{5,6,9,10,12}. Recent studies of extended electromagnetic theory (EEM) claim that this work could lead to the 'completion' of quantum theory and that it will be a deeper understanding of small scale gravitational effects that will be instrumental in this breakthrough. The correspondences of this new theory are presented and a description given of how this relates to the parameters that comprise times arrow and how it is related to our psychological perception of time.

The three-fold nature of noetic field theory is best symbolized by a Penrose triangle. See Figure 5A. The three base states are not separable in the 'standing wave' of reality space. In figure 5B, a modification of the form of Penrose's three worlds to be compatible with noetic theory, it can be envisioned how the three NFT base states cycle continuously into our spacetime from the twelve dimensional unitary domain that our reality is a

subspace of. The reader should understand figures 5A & B in terms of figure 9.1 to better conceptualize the CSCU.

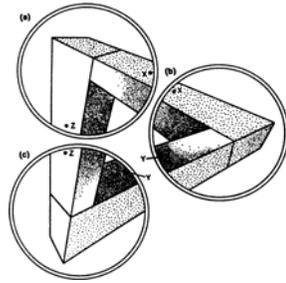


Figure 5A. The Penrose Triangle Impossible in three dimensions.

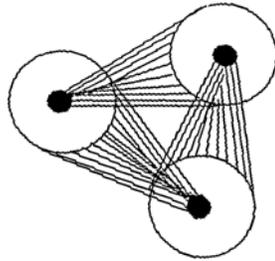


Figure 5B. The three worlds of NFT (Modified from Penrose 3 worlds, 1994).

The CSCU is considered scale invariant³⁹; the teleology of which has self-organized the embedding of our consciousness into a central perceptual position of the Hubble sphere as illustrated in figure 6. In Figure 7 a Holophote (lighthouse) is used to illustrate the *elan Vital*¹⁹ or life-force and how it enters spacetime and every atom of our being to self-organize life and the 'light of our mind'. Using the metaphor of the holophote, the noetic 'source' enters spacetime from the unitary domain through parallel transport in the spinor structure²¹ of the 'lens' and reflectors in the 12D hyperstructure. The rotation of the reflectors is symbolic of the dipole oscillation of the oscillating EM field. Interestingly the Frohlich frequencies in the brain have been found to be the same as those in the CMBR. Supralocality is outside the circle of the arrows; and the appearance is inward towards the center keeping with the CSCU supposition that points in our reality are in a subspace of supralocality.

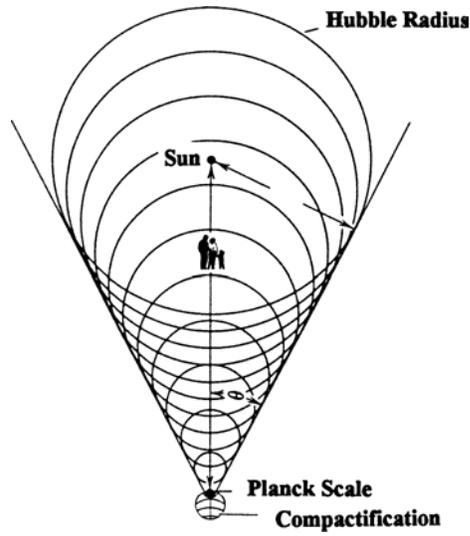


Figure 6. Current SM view of Universe from Hubble radius H_R reduced to a Planck scale spacial singularity M_{pl}^{-1} imbedded in N higher dimensions fixed in a Big Bang temporal singularity with the Man-scale at the center of the scale invariance.

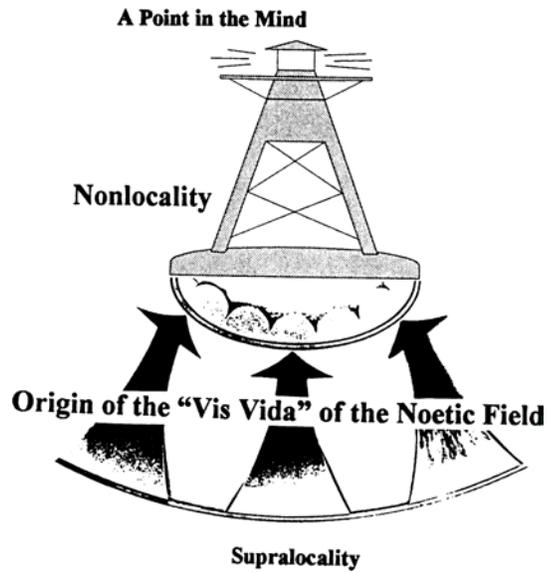


Figure 7. Holophote (light house effect) transition of unitarity by high frequency oscillating noetic field and 'elan vital' of consciousness. The physical structure projects the arrow of time from unitarity –NL-III through NL-1 & NL-II symbolized by the legs of the tower.

11. THE ORIGIN OF TIME IN THE CSCU

Now that the model of consciousness has been conceptually illustrated, we are able to show how the ‘flux tube’ of time is generated into our level of ‘virtual phenomenological’ reality. We have supposed that our reality is comprised of a standing wave of hyperdimensional spinor dynamics acting in concert in three Minkowski/Riemann 3(4)-D spacetime packages that together form the 12D supralocality of the complete CSCU. Because by parallel transport all the boundary conditions sum to zero at each present moment according to the Wheeler-Feynman/Cramer-Chu absorber/transactional model; we are comprised of the ‘matter’ projected from this fundamental space, and our consciousness is likewise coupled to and imbedded in this same material by a “philosophical tension”³⁰ caused by the flow of awareness in conjunction with thermodynamic evolution of matter and the teleology of the noetic field that mediates it. This structure is depicted in Figure 8. Two 3(4)-D packages are suppressed.

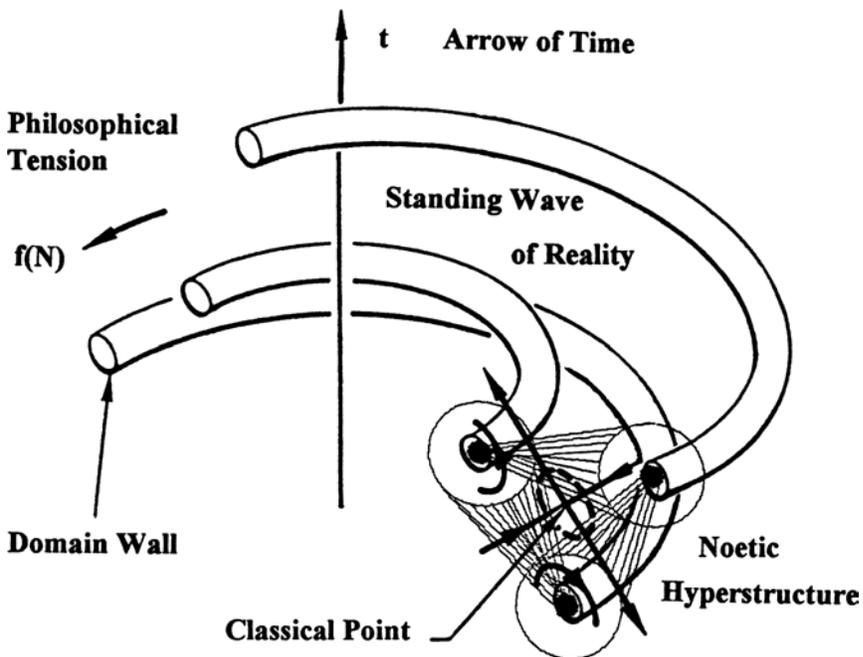


Figure 8.

12. ISSUES SURROUNDING STATE-VECTOR REDUCTION

Generally any quantum state may be reduced by the phenomenology of measurement according to the orthodoxy of Schrodinger evolution. This has been called the stable causality condition. There is no quarrel with this firmly established principle as it relates to a typical measurement where a particle or wave impinges a 'detector'. However spatially or less commonly temporally separated states of freely propagating test particles may become correlated through a weak nonlocal causal action of the quantum potential. Generally according to the locality principle there is no direct causal connection between points with space-like separation except for certain EPR pairs correlated nonlocally with the same unique spacetime package induced within the simultaneity of the initial pair production as in dual photon emission from a mercury atom.

But the case to be discussed here is a mechanism of geodesic deviation whereby initially separated systems without any initial EPR correlation may become superposed through the gravitational action of nonzero restmass photon anisotropy and longitudinal Extended Electromagnetic interactions (E-EM)¹⁰. Shimony states "it is impossible to capitalize upon the entanglement of the quantum state of a two-particle system for the purpose of sending a message to an observer of one of the particles by performing an operation upon the other particle. This is a theorem which has been proven in great generality by Eberhar, Ghirardi et al., and Page". It is the proposal here that this premise is true only by the postulates of quantum orthodoxy for more classical type states and not quantum ontology where the uncertainty principle may be clearly violated under certain 'non-collapse' conditions.

In this chapter it is postulated that there is an additional group of transformations with a variant causal relationship allowing spatially separated correlated systems to couple without collapse of the wave function through the tidal effects of gravitation creating a geodesic deviation in the normally null path by nonzero restmass photon anisotropy. This requires a complementarity between a stable and unstable causality, where the null path of the standard stable models may be maintained through the connectedness of the conservation of momentum and the validity of the CPT theorem. Or this causality may be violated by nonlocal gravitational interaction in the transformation of the higher dimensional hyperstructure through the introduction of an unstable causality and disconnectedness. This leads to the need for another group of transformations beyond the Galilean, & Lorentz-Poincare' groups; the description of which will lead to particle dynamics beyond the standard models that includes transformations of the flow of consciousness.

Roger Penrose ‘On gravity’s role in quantum state reduction’⁴⁵ gives an account of the status of the theoretical relationship of the role of a putative gravitational effect related to state vector reduction. Penrose is forced to conclude that the standard Copenhagen interpretation of quantum theory (QT) is incapable of defining any role for gravity. Penrose examines the quantum superposition of two different stationary mass distributions not in a specific spacetime but in a superposition of two slightly differing spacetimes. In all models of QT, phenomenological or ontological, the quantum state is considered to evolve according to forms of the Schrodinger wave equation.

$$ih \frac{\partial \psi}{\partial t} = -\frac{\hbar^2}{2m} \Delta^2 + V\psi \quad (12.1)$$

Issues that some physicists consider as needing further elaboration center around the nature of quantum objects, state reduction as it relates to the measurement problem, and whether QT needs to be extended to include non-collapse versions of the Everett/Bohm type. “...the resolution of the problem of state-vector reduction in quantum - mechanics should be one of the major tasks of a (successful) quantum gravity theory. This seems to be very much a minority view...It seems that many physicists do not even accept that there *is* a problem of state-vector reduction!”⁴⁵. The noetic group of transformations requires an ontological non-collapse extension of quantum theory.

In Everett’s well known paper³³ from which the ‘many-worlds’ interpretation of QT originated; Everett makes the assumption that the state of a system $|\psi\rangle$, evolves only according to the time-dependent Schrodinger wave equation:

$$ih \partial \psi / \partial t = H |\psi\rangle \quad (12.2)$$

13. NON ZERO RESTMASS PHOTON ANISOTROPY AND PHOTON STRUCTURE

The hidden gauge invariance for the photon occurs as an anisotropic restmass of $\sim 10^{-65}g$ that periodically couples to the vacuum zero point fluctuation⁵³. Although there has been discussion of non zero photon restmass for many years it has typically been ignored because as stated above it was considered in violation of Gauge theory and also to be ad hoc. Recently it has been shown¹⁴ that the photon has mass in terms of

considerations from the weak field limit and quantum gravity, both of which can be derived from first principles.

According to Einstein rest energy or mass is the result of external or internal structural motion of a particle. Unlike Fermi matter that maintains a well developed internal kinetic structure through atomic movements whether at rest or in motion, photons cannot be brought to rest without immediate annihilation and dissipation of their energy because its symmetry cannot be maintained at rest. For propagating photons the internal transformation undergoes anisotropic oscillation. The restmass fluctuates harmonically from zero to > 0 as a consequence of the complementarity of its wave particle duality; which signifies according to $E = MC^2$ a change in energy from inward reflection during the instance of mass and interaction with the vacuum to outward displacement through space during zero mass moment. In addition to the wave - particle duality photons also have complementarity between locality and nonlocality in their propagation. They exist both in spacetime and independent of it; therefore the timelessness of the photon is maintained during the masslessness of its wave propagation at the constant speed c , allowing the temporal particle moment coupling to the vacuum zero point oscillation to not interfere. Fluctuation in mass-energy is not mysterious as it is generally known that inertial and gravitational masses are an aspect of this movement²⁰.

“In other words, the transformation of “matter” into “energy” is just a change from one form of movement (inwardly, reflecting to-and-fro) into another form (e.g., outward displacement through space.) The possibility for objects of zero rest mass exists provided that they are moving at light speed. For if rest mass is “inner” movement, taking place even when an object is visibly at rest, it follows that something without “rest mass” has no such inner movement, and that *all* its movement is outward, in the sense that it is involved in displacement through space. Light does not have the possibility of being “at rest” because it does not possess any such inner movements”²⁰.

14. TIDAL EFFECTS OF NEWTONIAN GRAVITY

Based on the critical assumption of non zero restmass photon anisotropy, it becomes straight forward (conceptually) to apply the tidal effects of Newtonian gravity to produce a superposition of two spatially separated coordinate systems without collapse of the state vector. This means that there is a dual aspect to state vector reduction - one that applies classically in terms of the standard model, and another in terms of Everett/Bohm non collapse models by the action of the (B3) longitudinal field. The topology changes with mass. The tidal curvature change allows two spatially

separated geodesics to converge into one spacetime and under certain phase conditions to superpose without collapse; which is a nonlocal effect of vacuum zero point fluctuations.

The evolution of the quantum state described by the Schrodinger wave equation (12.1;12.2) and its reduction is considered to be the core of quantum theory (QT). It is suggested that the Copenhagen interpretation of QT provides an incomplete description of the physical world; and that the application of non zero restmass photon anisotropy leads directly to a dual description of state vector reduction in terms of both the standard model and non collapse versions of QT which are found not to be in violation of hidden gauge invariance in Gauge Theories as typically considered. In the Poincare' group the simplest realization is the geometrical interpretation of the free particle trajectory as a world line. It is suggested that the application of non zero restmass photon anisotropy leads directly to a geodesic deviation in apparent violation of the standard Copenhagen interpretation, but not for ontological noncollapse versions. This requires a description of strong and weak causal factors that relate to separated systems that are correlated and uncorrelated and suggests that there is another group of transformations beyond the Poincare' group needed to incorporate the higher dimensionality beyond the Minkowski/Reimannian metric. This has exciting implications for the completion of QT that will lead to a deeper understanding of the requirements for developing Planck scale Geometroynamics.

15. THE COUPLING OF THE NOETIC FIELD

It is generally known that the standard models of quantum theory and cosmology do not include consciousness or give an adequate description of the nature of time; suggesting that the elucidation of these ideas must come from extended theoretical insights. Human perception indicates a flow of time - from past, to present to future in accordance with the second law of thermodynamics by appropriate changes in entropy of the system observed as it undergoes evolution. Thus temporal order seems related to entropic order; and these dynamics constitute how we perceive 'action' or translation in this particular dimension, the dimension of time.

In terms of the vertical or up/down dimension, 'action' or direction is determined in our awareness by the nature of the gravitational force. In the absence of gravitation one loses all 'sense' of this direction or dimension. Can this relationship of the force of gravitation to direction be equated to a similar action for the perception of time? Is there a force or inherent 'action' in the cosmology of mind that couples awareness to the entropic activity observed in the perceived external reality that we equate with the flow of

time? Do we 'ingest' time parameters through an 'axis mundi' into our psyche during transit through the cosmological sea as a whale ingests plankton while swimming in the ocean? If it is true, that the entire perception of time is a creation of a normative human ontology through an innate or habituated 'philosophic tension'³⁰ that drives the orientation of our mind, a decoupling from the flux of this noetic field would allow a reorientation of our 'psychosphere'^{6,9,10} and the possibility to re-tune the perception of our psyche to additional or alternative parameters of entropic 'action', time or atemporality. This is a key point in understanding the nature of time and will be described in more detail.

16. THE NOETIC GROUP OF TRANSFORMATIONS

This paper postulates additional transformations here called the 'noetic group' with an another causal relationship distinct from the strong causality of the standard model allowing spatially separated systems to exchange information without orthodox collapse of the wave function. This occurs through a nonlocal gravitational coupling of (B3) field effects which produce a geodesic deviation mediated by intentionality. The dynamics of particles and fields are described by various groups of transformations; the Galilean group describes Newtonian mechanics, and the Lorentz transformations describe modern theory. This action is outside the current limits described by the Galilean, Lorentz and Poincare groups of transformations. This additional noetic transformation of a normally null path is allowed in extended electromagnetic theory by nonzero restmass photon anisotropy¹⁴ without violating gauge theory¹⁵. The correspondences in physical theory, for example the reduction of quantum mechanics to classical mechanics or the recovery of thermodynamics from its successor statistical mechanics will also apply in relation to the mind and the nature of time. A correspondence between a complementary stable and unstable causality is shown to reduce to the null path of the standard model.

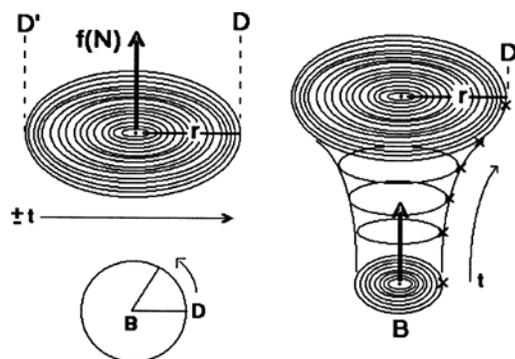


Figure 9. A conceptualization of the complementary structure of the wave function of an entity. $F(N)$ is the noetic quantum of action supplying the ‘philosophical tension’³⁰ that couples consciousness to the ‘physicality’ the entity is imbedded in. B is the point of entry or birth of the conscious entity into local spacetime; and D is death or exit from the domain. R is the psychosphere radius of the entity symbolizing the coherence length and content of the mind. In the smaller reference circle it can be seen that r evolves with age from B to D ; although the radial velocity is equal, the maturer entity maps out more area in the same time. This explains why time perception seems longer for a youth and accelerates for an adult. In an eternal sense the entity would ‘oscillate’ around some average position of its wave function. An entity may acquire an infinite amount of information; death does not come with a limit of information but because stressors have a tendency to translate the coupling loci (represented by the X ’s in the exploded figure) until the associated ‘de Broglie wave of consciousness’ reaches the limit of the domain wall of the ‘wave function’ and the ‘spirit’ tunnels out of the Minkowski domain of our reality.

This new group of noetic transformations is a complementarity of NL-I & NL-II dynamics, which is an element missing in the typical EPR experiments done with classical - either temporal or spatial measuring devices because of the action of the uncertainty principle in the reality of our subspace. The mind is not a classical device, but a whole cosmology encompassing both NL dynamics simultaneously: The standard classical either or interactions acting in brain phenomenology and an ontological non-collapse complement acting in the noetic mind. In CSCU cosmology an additional causal principle is involved in the noetic group of transformations. Its action occurs through the nonlocal teleology and action of human intentionality¹⁰. These CSCU transformations act in an ‘event-like’ manner when the correspondence is relative to locality and are energyless interactions as described by extended electromagnetic theory (E-EM) and gravitational interactions¹⁰. No particle mediates the energyless interactions which exchange information by Bose-Einstein superposition.

The action of intentionality modulates the spin alignment angular momentum of the noetic field. This constitutes a gravitational action on infinitesimally separated geodesics by the longitudinal action of the (B3)

field that does not collapse the wave function. This is an example of the non-computable actions of the mind/body interface where intentionality acts as a phase regulator on the holoscape manifold of Pribram's dendritic microprocess^{10,12}. This action is also the same as that described by the psychon action on the dendron by Eccles.

17. FINAL CONSIDERATIONS

We have seen that the application of non zero photon restmass provides a simple method to describe a quantum dualism that includes both collapse and non collapse models of quantum state reduction. This has broad implications for completing QT, setting the stage for a deeper understanding of Geometroynamics at the Planck scale and an understanding of noncomputability as it might relate to advances in quantum computing and applications to understanding the nature of consciousness and time.

Both general relativity and quantum theory are known to be incomplete. Twistor and superstring theories are currently considered the most promising candidates for their nonlocal integration; but both lack a 'Rosetta stone' for delineating the unique topological package of higher dimensional hyperstructure required to complete the task. Both eastern and western theologies claim that gravitation is caused by the movement of spirit - spirit, ki, chi, or prana is not immaterial but Bose or photon based in Noetic theory. The spin exchange model of quantum gravity¹⁴ incorporating the expanded Wheeler- Feynman absorber theory of radiation^{24,26} putatively describes gravitons as superposed moments of confined nonlocal photons mediated by unitary dynamics.

The cosmological constant is the coupling constant between both domains; the zero averaged fluctuation of the gravitational potential localizes and delocalizes the flow of conscious energy. The lower limit for the quantization of mind is a Planck scale hypercavity where the gravitational potential may remain balanced when at rest. Gravitational mass dependency is not required by conscious entities for state evolution as in the Hameroff-Penrose Orch-Or model because spacetime curvature provides boundary conditions gating the energy flow of Bose psychons. No gravitational work is required, mental activity is frictionless as in the (B3) field at this level, but not at the higher organic species level. Radiation or light pressure is sufficient to modulate the boundary conditions. All levels of scale are proportional to the elemental Planck unit through the law of energy quantization. Degenerate energy from infinite density singularities not being applicable to consciousness. Thus one may whimsically query 'How many Einstein's (moles of photons) does it take to turn on a light bulb? The bulb

being a 'byte' of Planck bits pertinent to the conscious scale of the entity. Thus entity Z with a 10^N Planck byte raster of consciousness, has a 10^N byte psychosphere and resolves factors of 10^N bytes of external and internal mental events. Thought being dynamic moments of local quantization and summation of conscious energy. This is the cosmological root of consciousness.

18. SUMMARY

Noetic theory gives a full explanation of the origin of time, a comprehensive description of consciousness and experimental tests for isolating the noetic field have been prepared. 1. Existence is in terms of a continuous state conscious universe (No Big Bang) 2. This means that there is a nonlocal teleological principle that has causal action on both cosmology and living systems. 3. This further entails a *vis vitae* or *elan vital* - vital force that in terms of noetic theory is PHYSICAL and therefore falsifiable. 4. This vital force is the noetic field, a quantum of action which is associated with the unified field and chi, prana, etc in common nomenclature. 5. Because the noetic field is associated with the unified field it is also coupled to small scale gravitation which introduces the causality of consciousness both in terms of the universal teleological principle, and in terms of Man's consciousness and agency. 6. This model besides new cosmology requires extended quantum, electromagnetic and gravitational theory. The foundation for most of which is already known. 7. All of physics is based on measurement and duration using yardsticks composed of the same material that we are made of and therefore steeped in our consciousness. Subjective and phenomenological Reality is therefore an illusion (as we are coupled to it in our ordinary wakeful state). Whether this seems hard to swallow or not at present, this is the most fundamental requirement to embrace if we are to get bet beyond or 'Godelize' sufficiently to ever understand both the nature of time and the nature of consciousness. 8. Therefore we assume that ALL of physics is also falsified up to this 'classical' limit (same as Newton was falsified). 9. Therefore time is an illusion also. All the 5 currently described arrows of time are not psychological per se but rather functions of the consciousness or the teleology of the conscious universe; but because in the continuous state conscious universe of noetic field theory consciousness is physical, all the parameters of the arrows of time are likewise physical. 10. Opposed to reductionism of the standard models, the compactified dimensions were not laid down in the big bang to exist at a Planck scale 'below' us. In contrast we are a subspace of a higher 11(12)-D universe in continuous transformation (continuous state). This is very important because

this sets the foundation for how the physical arrows of time and how the noetic *elan vital* is ‘projected’ into our subspace 3(4)-D domain. This is what is to be tested in the experimental protocol: The entry point of the noetic field and the structure it gives to spacetime and consciousness.

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