

THE NEOCLASSICAL INTERPRETATION OF MODERN PHYSICS AND ITS IMPLICATION FOR AN INFORMATION THEORY BASED INTERPRETATION OF SPIRITUALITY

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ABSTRACT: The neoclassical interpretation of quantum mechanics which re-introduces older conceptual models of gravity and electromagnetism transformed by modern advancements in the field is discussed as a natural outcome from the interchangeability of quantum mechanics and fluid dynamics in light of recent macro-level experiments which show behaviors previously believed to be confined to the quantum world. This superfluid model of mechanics and the known behaviors of superfluids is suggested as a possible substrate and system for the storage and processing of data. Methods of data storage found in natural systems such as the brain are compared via extensive use of analogies to support the conjecture that a rational and mechanical basis for spirituality can be supported under the neoclassical interpretation because of the inherent persistent structure and interaction of the suggested pervasive medium. This model of information theory spiritualism is suggested as a basis for the unification of physics with more philosophical approaches in the study of metaphysics.

KEYWORDS: Quantum mechanics; Information theory; Spirituality; Neuroscience

INTRODUCTION

The line between classical and modern physics, when examined very closely, is somewhat blurred. Though the label “classical” most often refers to models prior to the switch to the quantum paradigm and the characteristic discrete particle treatments of physics, it may also occasionally be used to refer to macro physics prior to relativity. Here we discuss the optional fluid dynamics basis of the quantum paradigm and the interchangeable nature of discrete and continuous treatments of modern physics. This direct interchangeability, in light of walking droplet experiments, has led to the emergence of deterministic hydrodynamic analogs of gravity and quantum mechanics which might be called a “Neoclassical Interpretation.”

This approach to physical interpretation of fields subsequently leads to the possibility of a substrate which may be envisioned as a data storage medium. If deterministic chaos is accepted as granted, the concept of free will can be equated with the “illusion of intent” imputed upon humans as it is often imputed upon other complex systems such as evolution. With the homocentricity of consciousness removed and consciousness envisioned as a computational process, the emergence of consciousness is the simple inevitable conclusion of evolutionary pressures. Consciousness is then envisioned as various levels of arrangement and interactions of data systems which can possess self-representation in the form of self-similarity.

When consciousness is envisioned as purely data storage and computation, this broader definition also allows that the term “spirit” might be considered synonymous with data processing systems. This conjecture allows for the categorization of data systems which exist throughout nature as also “spiritual”. With the inherent multi-layered and overlapping nature of data and reliance upon interpretive keys, complex data systems might be postulated to exist throughout nature which also share commonalities to consciousness and would thereby be called spiritual. This interpretation of consciousness and information systems combined with the existence of a ubiquitous medium or substrate for electromagnetic phenomena which might store and process data via its configuration, gives a purely deterministic, rational and mechanical basis for a spiritual world which humans might interact with.

HISTORY

“The electromagnetic field behaves as if it were a collection of wheels, pulleys and fluids.”

James Clerk Maxwell

The early notable developments toward electromagnetic theory were all done in a theoretical environment which presumed a fluid “ether” as the basis upon which all phenomena occurred. In 1746 Euler modeled light in a frictionless compressible fluid, a century later Faraday modeled it as vibrations in lines of force and shortly thereafter Maxwell combined their efforts into “molecular vortices” upon which eventually his famous equations were based.

As early as 1926 just one year after the formulation of Shroedinger’s equation, Erwin Madelung demonstrated that it can be recast in hydrodynamic form. The Madelung equations are Eulerian and very directly show the relationship between fluid dynamics and quantum mechanics.

By 1950 the phase space formulation of QM provided a fully realized and valid formulation of the science which could deal with both position and momentum in a classical manner. The Wigner-Weyl transform provides a mapping between this formulation of QM and the Hilbert space operators in the Schroedinger representation which is completely equivalent (Curtright et al 2005, 20012). This shows the direct mathematical compatibility of more classical treatments (Hamiltonian) and quantum mechanics through deformation (with parameter \hbar/S) and perhaps gives a real-world, easily understood relationship between the two through the common sense term “deformation”. Additionally, it has been shown that the Wigner quasiprobability distribution function can, via deformation, match a phase space distribution which describes DeBroglie-Bohm causal trajectories (Dias, Prata 2002). These relationships show how the deterministic chaos found in hydrodynamic systems could lie underneath the probability distributions used in quantum mechanics thus continues the theme of interchangeability.

Phonons are the quantum mechanical treatment of mechanical waves in materials in which the continuous phenomena of conventional mechanical waves, can be treated as discrete particles with all the behaviors and expectations of other quantum mechanical particles. These quasiparticles have no physical existence but their correspondence to border conditions and behaviors of the material make them an extremely useful convention. This use of quantum mechanics to solve problems within the continuum mechanics domain shows a direct interchangeability of the systems in one direction. The only constraint to going in the other direction is tradition and the question of if chaotic determinism truly underlies the probability found in quantum mechanics.

In roughly the past decade, all of the strange and seemingly non-physical behaviors of quantum mechanics, which were previously believed impossible in the macro world, have been replicated in numerous fluid mechanics experiments. This includes the dual-slit experiment, orbital quantization, single-particle diffraction, zeeman splitting, quantum tunnelling and a host of other behaviors typically only associated with the mechanics far below the observable macro realm.

The first of these experiments were performed by Yves Couder who used a vibrating silicon oil bath to create a situation in which a millimeter-sized droplet bounces indefinitely upon the surface. These “walkers” move along the surface interacting with the waves they produce. The location of a walker confined to a cavity, when tracked over time can be described as a probability distribution which is the faraday wave mode of the cavity, just like a particle in a quantum corral.

The similarity of this system with quantum mechanics is best described by a leading experimental researcher at MIT in the August 2015 issue of *Physics Today*:

The walker represents an example of an oscillating particle moving in resonance with its own wave field. The droplet moves in a state of energetic equilibrium with the vibrating bath, navigating a wave field sculpted by its motion. The walker system continues to extend the range of classical systems to include features previously thought to be exclusive to the quantum realm. What might one infer if unaware that it is a driven, dissipative pilot-wave system? One would be puzzled by the prevalence of quantization and multimodal statistics. Inferring a consistent trajectory equation would be possible only in certain limits. Doing so in the limit of weak walker acceleration would suggest that the droplet's effective mass depends on its speed. Multiple particle interactions would be characterized by inexplicable scattering events and bound states, and baffling correlations. If one could detect a walker only by interacting with the fluid bath, the measurement process would become intrusive. If a detector confined the walker spatially, one would infer a position–momentum uncertainty relation. If detection required collisions with other droplets, disruption of the pilot wave would destroy any coherent statistical behavior that might otherwise arise.

John M.W. Bush

THEORETICAL DEVELOPMENTS OF NEOCLASSICAL PHYSICS

With so many mechanical explanations for quantum mechanical behaviors provided by the walker experiments, it becomes necessary to examine any behaviors of quantum mechanics which are not described by these experiments. The differentiators of first interest are the non-local effects found in entanglement and the physical interpretation of quantum uncertainty as ontological indeterminacy instead of complex chaotic determinacy.

It must first be recognized that the wave of probability which can describe a walker is separate from its pilot wave. This system is described by Bell as a close approximation of DeBroglie's later "double-solution theory" in which DeBroglie stressed the "harmony of phases" and is shown in the experiments by the statistical wave and the pilot wave having the same wavelength but different geometric form.

In the analogy provided by the walker experiments, the dynamics of the system can be described as a non-local. In this case, the complex state of the system at any point point in time describes a non-local hidden variable theory. These experimental findings in combination with the interchangeability between quantum mechanics and fluid dynamics has led authors from previously disparate fields to be able to propose

deterministic dynamics which shed light on possible mechanics underlying seemingly random behaviors. The differentiation between particle and quasiparticle is a primary area of exploration for this interpretation.

Most notably, Ross Anderson and Robert Brady of Cambridge have made major contributions to the exploration of this interpretation as well as solid theoretical grounds for deeper investigations. In “Maxwell's fluid model of magnetism” the authors show that a wavepacket travelling along a phase vortex in an Eulerian fluid obeys Maxwell's equations, is emitted and absorbed discretely, and can have linear or circular polarisation. Additionally, the measured correlation between the polarisation of two cogenerated wavepackets is exactly the same as predicted by quantum mechanics, and observed in the Bell tests (Brady, Anderson, 2015). Another paper by the group discusses a violation of Bell's inequality in fluid mechanics thereby providing underlying deterministic mechanics in place of the arguably less scientific models of the behaviour (Brady, Anderson, 2013).

Robert Brady in “The Irrotational of of Compressible Inviscid Fluid” outlines a comprehensive physical mapping between quantum mechanical theory and fluid dynamics in which he not only provides an analog for gravity but also introduces the concept of a relativistic quasiparticle called a ‘sonon’ which exhibits spin $\frac{1}{2}$ symmetry (Brady 2013). This sonon concept bears a striking resemblance to the smoke ring or “Vortex Atoms” initially proposed by Lord Kelvin, thus further continuing the neoclassical theme to this interpretation (Silliman 1963).

Given that the current quantum mechanical paradigm has been very successful, the question that arises is what advantage might the use of a different interpretation and set of mechanics have if they are already completely interchangeable? The idea of quasiparticles being simply properties of a substance, however, provides for the possibility of direct manipulation of the medium, and analogies to the manipulations of fluids, when applied to the vacuum, may lead to entirely new experimental processes

From the relativistic perspective, it is often improperly assumed that a medium for electromagnetic effects is mutually exclusive with the principle of relativity. A conflict, however, is only true for the presumption of one-way light speed isotropy in relativity, which has never been experimentally verified. The Lorentz transform, however, remains valid in preferred frame mechanics in which the one-way speed of light is anisotropic because the two-way speed of light can remain isotropic under the same circumstances.

In 1920 at the university of Leiden, Einstein extolled the virtue and absolute necessity of an “aether” and furthermore praised Mach's idea of a gravitationally mediated preferred frame mediated by the average gravitation of the universe, but

Einstein still resisted a preferred frame mechanic for electromagnetism. Lorentz invariance, however, is always maintained in two-way tests of light speed. Therefore the possibility of preferred frame mechanics still remains fully within the bounds of modern physics and also rests under the umbrella of the “Neoclassical interpretation”.

While these explorations have opened a new field of inquiry ripe for further study, the re-introduction of determinism as a possible underlying mechanic for the universe may leave investigations of consciousness and spirituality in a very uncomfortable existential position and, on the surface, seemingly a scientifically untenable one. The removal of pure probability as a basic source of reality simultaneously removes any magical or non-mechanical explanation of spirituality. This narrowing of possibilities for spirituality seems to, once again, lean strongly toward the pure “materialism” regime.

The question we propose to answer in the next section is if a rational deterministic system of physics can simultaneously support a system of spirituality which does not violate the mechanistic pre-requisites of the neoclassical interpretation.

INFORMATION THEORY SPIRITUALISM: BACKGROUND

In the modern age, computer technology has granted a perspective and intuition about the nature of information which was not readily available to previous philosophers or religious thinkers. While the “faces-or-vases” concept may have been around long before Rubin, the overlapping or multi-layered nature of information has now become a far greater part of the collective human experience. We’ve even recently discovered that the same phenomena occurs in DNA.(Trifonov et al 2012)

Secondary to this, the meaning of information is dependent upon the interpretive key which uses the information. For instance, a computer disk created to install a program for a “Windows 8” computer is a set of ones and zeros which, if given without context to a hypothetical advanced alien species, might not yield anything to their scrutiny even after thousands of years of study. The interpretive key represented by the whole set of computer technology is an inconceivably long line of interlocked, dependent, and arbitrary solutions which follow lines of reasoning which are connected all the way back to the roots of human language.

This dependency upon context is part of all information transfer. Information only has meaning by the way it interacts with another set of information which we could call an interpretive key. This key is also an analog to an encryption algorithm. The overlap of information and the dependency upon the key can be described in the following analogy: If all the parts to a car are laid upon the ground, a engineer well versed in the assembly of a car might immediately recognize it as a car. Another

hypothetical engineer who has somehow never experienced the idea of a car but had been taught to manufacture motorcycles might recognize a potential motorcycle within the parts. A native from the jungle might see nothing but a pile of garbage.

It is crucially important to note, however, that it is none of these things until it interacts with the information of the observer and is assembled in a particular configuration. The configuration state itself is superior and independent to interpretation. This hierarchy and differentiation between “raw data” as a state configuration and “information” which relies upon interpretive key will be central to further discussion. This analogy fails to capture, however, that some configurations of raw data can overlap in a way that makes the data truly exist as two or more different sets of information simultaneously.

Indulging one further analogy, one can imagine a hypothetical electrical engineer from the early twentieth century which has never encountered the idea of a video game nor understands electronic computing. Then provide him with any manner of metering and sensor-like equipment requested to investigate a modern computer running an immersive online video game world. Next, prohibit this engineer from ever connecting a monitor or looking at one if it was connected. His analysis of the events at the location of the computer will be accurate and quite descriptive of spinning drives and moving electrical impulses but will certainly not include wizards, dragons and magical swords. Suggesting these events are simultaneously occurring in the same location as he has investigated would seem nothing more than the purest insanity to him. These analogies, together describe a multitude of accurate interpretations of the same physical states and how overlapping interpretations of the same set of data create multi-layered information states.

ANALOGS OF DATA STORAGE AND PROCESSING

There is little question that the human brain stores and processes data and that a computer performs the same function in a radically different way. Humans have accomplished data storage and processing through punch-card systems, beads on rods and collections of gears as well. Therefore, if human consciousness is approached from a purely scientific perspective, it is unfounded to presume that a human or animal brain is the only complex object capable of holding and producing consciousness. We have established historically that there are numerous methods by which data storage and processing may be accomplished, so therefore, adequate complexity of an information system should be capable of creating and housing human-like consciousness.

Currently data is often stored as magnetic charges and changes to a reflective surface and sometimes as symbols upon a page which are interpreted from one or

more of the previous storage types. In each case however, it is a physical configuration of states with regard to one another and with regard to larger systems which allows interpretation to occur. Both the physical configuration of the large contextually arranged interpretive engine and the physical collection of charges, dots, etc that make up the data being interpreted. This set of relationships exists in a chain that eventually relates the smallest configuration to very large configuration relationships. Both data and interpretation key exist in a particular structure and therefore relationship that can be conceived of as mechanical in nature.

Computation is a structured change which occurs to one set of data because of its interaction with another set of data. The reason computation can be done with sets of gears is because its nature is the physical interaction of one set of physical states with another.

In the human brain, current science presumes that data is stored via long term potentiation; a strengthening of connections between neurons. This process however is apparently a simultaneous reading and writing of data. This combination storage technique can be likened to a combination record player and recorder. If a needle used to listen is also sharp enough to cut into the record and record, an old phonograph-like set up might simultaneously record ambient sounds into a current recording being played resulting in overlapping data.

The resulting interference pattern represents two sets of data which are both preserved. In this analog model, the smallest possible resolution of data storage is a single atom. If one represents synapses and their strength as the smallest component of wave data as an analog to the positions of atoms on a record, one possible unit for an overlapping methodology of data storage and its resolution limit is apparent.

The only question remaining to the use of this analogy is the source of the ambient “sound” for recording. If we presume that, like the record player, there are grooves already cut but also presume that no groove is cut so deep that it prevents the needle from jumping to another track then we can see that if there is similarity between the previous recording and the subsequent one, this relationship will guide the needle’s path.

The firing of neurons is a delicate electrochemical process which can be altered by external fields and by its own fields (McFadden 2002). Therefore the synchronous firing patterns of the brain create complex “global” internal fields that modulate the probability of a given neuron’s firing in addition to the normal synaptic influences. This means that the physical configuration and pattern of activation of all information being accessed at a given moment in a brain subtly alters the simultaneous reading and writing process involved in long-term potentiation.

Therefore the unique interference pattern in the electromagnetic field produced by the brain represents the “sounds” to be recorded by the phonograph, in the current analogy, as it reads data. In this analogy and its twin processes in the brain, the signal to be recorded is a superposition of waveforms from simultaneous lines of synaptic firing which, in turn, is then superposed upon the recording medium which already contains information. This represents just two steps in what might be termed a “fractal” model of consciousness.

In this model, interpretation by a source wholly outside this system requires complex fourier-transform-like operations. For those within the system however, the relationship between the configurations of data provides a physical analog of similar signals which are automatically activated by the structure of the waveform data input. By way of analogy, the form of the input, when similar to previous input, will cause the needle to follow a similar path.

Continuing the analogy, if another needle is placed just ahead of the initial needle and is loosely coupled with the first, it will create a prediction. This ability to predict is a central identifying characteristic of consciousness.

To finalize and extend the analogy, the “global” field produced by synchronous firing is better compared to numerous loosely coupled needles moving across the record together. Then each of these needles has another set of loosely coupled needles ahead them for the purpose of prediction and error correction. In the brain, this coupling is proposed to be electromagnetic in nature while the actual firing of a given neuron (a needle) is the central focal point and confluence of numerous simultaneous influences.

INTERCHANGEABILITY OF DATA PROCESSING SYSTEMS AND FLUID MECHANICS

It may be supposed that the use of spinning disks in computer technology and our use of a simple vinyl record to provide a convenient analogy are not coincidental but a reflection of the necessity of cycles in data storage and processing. To now provide an example of fluid mechanics as an analogy to a data system it is necessary to imagine moving the needle around the record instead of spinning the record itself.

The first question to be examined in this analogy is if a fluid medium can represent a possible form of data storage. Immediately it is apparent that a perfectly uniform fluid stores no more data than a uniformly charged magnetic disk. It is only differentiations in the magnetic field and therefore differentiations in a fluid which are capable of storing data. The atomic configuration of a seemingly uniform fluid, would also have to be perfectly uniform or some data would be present.

In an idealized fluid like Maxwell used, we can presume that densities and rotations can provide physical analogs to components of a machinery somewhat like Charles Babbage's analytical engine in the form of "wheels pulleys and fluids" and the waves formed by differentiations in density can provide an analog to the various fields created by synchronous firing patterns in the brain.

To continue to use the simple record analogy from earlier, one must envisage a mechanism for recording. The mechanism of localized alteration of physical configuration or the "recording needle" in a fluid is vortices. The mechanisms of wave-vortex duality and vortex coupling found in fluid dynamics (Bühler 2005) provides sufficient analogy to the above described systems to further uphold the conjecture that fluid mechanics describes a system of data storage and processing in this conceptual framework.

The adding together of fluid flows, in this system, behaves much like the superposition of waves described in our record analogy because waves and vortex evolution are inextricably linked.

Upon full consideration of the sonon model of quantum mechanics proposed by Brady, the human brain can be considered an analogy of a fluid system with stable vortices and fluid flows whose coupled oscillations result in whole-system dynamical changes which are simultaneously local and non-local.

The behaviors of turbulence in large scale fluid dynamical systems was best characterized by Lewis Fry Richardson in the rhyming verse:

*Big whirls have little whirls that feed on their velocity,
and little whirls have lesser whirls and so on to viscosity.*

In modern fluid dynamics this phenomena has been extended and summarized as:

*When little whirls meet little whirls they show a strong affection,
elope, or form a bigger whirl and so on by advection.*

The behavior of vortex addition and turbulence add additional complexity for the methodology by which data, in the form of the physical configuration of the medium, may be both encoded via branching and combination as well as processed via large scale coupling effects. It also shows the fractal nature of large scale systems such as planetary weather systems which, when zoomed out, may be compared to the complexity of the computation occurring in the human brain.

FROM DATA TO INFORMATION, A MECHANISM FOR MEANING

To better define consciousness we must first remove any reference to this ill defined concept and build it from more basic concepts. In the previous section we discussed

data storage without any reference to interpretation. There was however, physical representation.

In the translation of sounds to a record, the physical manifestation of grooves is a direct representation of sound via mechanical interaction. In the expanded analogy of multiple loosely constrained and coupled needles passing over a substrate with some pre-existing information, we can easily imagine the creation of a spiderweb of both deep and shallow grooves which may look extremely similar to axons and dendrites. Dendrite growth has been shown to be mediated by the activation patterns of nearby neurons. The afferent activity, when highly structured, leads to structured development of dendrites. In the visual system, the segregated pattern of afferent input to ocular dominance columns influences dendritic growth of neurons in the visual cortex. Dendrites of neurons close to ocular dominance borders remain preferentially in one column and do not usually extend across borders.(McAllister 2000) The correlation of the physical structure of the optic system with the physical structures it processes, in combination with structured dendritic growth, gives an excellent example of the analogy of physical configuration based storage of data. The connection between the represented data and the original object being represented is stored as a similarity of physical state relationships.

Furthermore, it has been shown that astrocytes are capable of retaining long-term magnetic charges such that the complex field created by the interaction of firing neurons could leave a magnetic trail in glial cells for the structured formation of dendritic growth to physically reflect a local feature of the field produced by recent firing patterns (Pereira, Furlan 2010). Here we further refine the concept of the “needle and groove” as physical storage of a passing field configuration via dendritic growth providing long term storage of the temporary magnetic storage provided by glial cells. The modulation of the passing field by the previously stored field before dendrite growth is an added layer of complexity that is assumed.

In the analogy and model discussed, the signal mixing of data would lead to ever greater levels of abstraction such that the physical similarity between the incoming signal and the actual physical shape stored via combination with previous signals would quickly become unrecognizable but the physical analogy between the development of neuronal networks and the electromagnetic fields they produce would remain. This explains why extremely basic simple shapes can be found to physically exist in the structure of optic neurons but objects of any complexity are not directly physically represented. They are, instead, stored as a superposition of numerous other shapes.

Interestingly, the shape created by axons and dendrites or by the record analogy, tends to physically resemble a hierarchy of types or a flowchart of the “objects” found

in object oriented programming. These physical similarities can be viewed as interfaces which provide connection between physical states.. The physical similarity provides the source of the interpretive key which connects one set of data to another and allows their interaction. The combination of form and function operates as conversion schema and thereby is extensible based upon context. The behavior of the “needle” is defined simultaneously by the incoming information and the existing information.

Therefore, in the example of the computer system playing the role of the “key” to interpret some small bit set of data, we can look upon the history of computing and observe how hardware defined the development of software and software defined the development of hardware in what may appear to be a feedback loop but may be better described as simultaneous or “superposition”.. The specific keys between these things such as the ASCII code or XML schemas, however, are more arbitrary than naturally developed systems because of the human interaction with computing systems. They therefore lack some of the automation provided by the physical similarity of a groove in record to the actual sound wave it represents

As discussed earlier, if a sufficiently complex interpretive “key” is used in relationship to some simple set of states, complex behaviors arise. Here we have discussed the development of a complex “key” in the form of the machinery of either a brain, a fluid flow, a record, or a computer. In each of these cases, simple interactions such as a few bits of information from the internet, a sound, a wave from elsewhere in the fluid or light impinging upon cells of an eye, the information, when used in the combination read/write regime, will cause the key to be altered in a way which is related to the sum total of the data contained therein. This is best described as an evolutionary or emergent process.

This data interaction can be coupled in a complex fashion to further downstream interactions with the data set and thereby evolve into complex actions. (such as animal behavior) This interrelation can be compared to dropping a stone in a river and its long causal chain relationship to the motion of some other single pebble resting on the river bottom far downstream. It is usually described as chaotic determinism.

Without calling upon the concept of consciousness, it can be stated that interpretation of data and therefore the communication of information is simply the interaction of a large accumulation of interrelated data with a simpler set of data so that physical comparison *to* and therefore the subsequent alteration *of* the larger data set is the natural result. Comparison, cataloging and storage occur in a single analog process.

This superposition-like phenomena can naturally be called experience as it leaves a physical impression of the interaction interlaced with previous physical impressions of similar phenomena.

ANALOG DATA PROCESSING AND EXPERIENCE

Those phenomena most closely associated with conscious experience can be described as simultaneous comparison of large sets of data with the ability to predict. The loose coupling of numerous read/write mechanisms previously described as a grid of record needles can provide such a mechanism such that the relationships of the needles (a matrix of their instant positions) at a given moment describes an over-arching interrelationship of incoming data with a large portion of the recorded data. The picture described by the grid is proposed as a conscious moment. This analogy would be extended to the complex electromagnetic field which exists in duality with the firing pattern of neurons in the brain. A single two-dimensional slice of the electromagnetic field could be compared to the grid of needles.

In the case of the record needles, a grid which covered the whole record would provide a pattern of relationships between the needles which included the whole set of data at any given moment. Let us propose that the needles are coupled by a system of springs. Any disruptions in the synchrony provided by the coupling mechanisms would reduce the interrelationship of the data described by the needle matrix and therefore reduce the amount of data being compared at a given moment.

This synchrony dependence is a direct correspondence to the synchrony dependence of consciousness found by numerous researchers (Pereira, Furlan 2009) (Hameroff 2010). This description of a dynamic data processing system provides semi-physical mechanism for the translation of physical experience into conscious experience without specifying the level of complexity or specific components necessary to accomplish specifically human level consciousness. This basic system infers a nearly infinite range for “levels” of consciousness related to the size and complexity of the collected data set in combination with the total synchrony the data set and reading/writing mechanism achieves.

SUPERFLUID DATA MEDIUM PROCESSING AND ENERGETIC PARTICLES

In conventional fluids, structures such as vortices do not retain their state very long with respect to the speed of wave transmission within those fluids. In inviscid fluids, however, these structures become long lived. Structured vortex filament formation has been found to be a characteristic behavior in rotating superfluids(Lounasmaa,

Thuneberg 1999) (Ancilotto 2014). This persistent structural behavior identifies superfluids to be capable of long term data storage.

Mechanical waves traveling along these vortex filament lines will result in torque stresses in the fluid which will alter the density and rotation profile of these vortex filaments which might otherwise be called “lines of force”. A single wavefront, when considered as a moving sheet or membrane, will behave similarly to an electromagnetic field in that a redistribution of stresses along its plane will be dependent upon inhomogeneities in the fluid. If this process is viewed as a physical analog of electromagnetic field combinations where the inhomogeneities (vortices) are viewed as point source charges, the alterations in the vortex filaments will depend upon the entire local system’s configuration.

This two dimensional picture can then be compared to the surface interface and walkers in the Couder experiment. The vortical structures play the part of the droplet and are created by the torque along the plane of propagation. This concept provides a secondary picture of the physical nature of wave particle duality and this alteration of vortex filaments in a superfluid medium provides a read/write mechanism similar to those discussed in the brain in which the stable vortex filaments play the part of neuronal and dendritic structures.

These alterations to the electromagnetic medium in the form of pulsating vortex filaments are proposed as a model of energetic particle correlates to the physical particle model of the “sonon” proposed by Brady.

THE QUANTUM VACUUM AND DETERMINISTIC CHAOS DATA SYSTEMS

The analogy between quantum mechanics and fluid dynamics infers the possible existence of quasi stable vortical structures present in the fabric of the quantum vacuum. This infers an additional level of information may be gleaned from and stored in the seemingly random fluctuations of the quantum vacuum and opens the door to a valid area of inquiry which might not otherwise be considered worthy of investigation.

Furthermore, should the data storage capability of the vacuum be confirmed, the interaction of human brains with this data system would also constitute a valid “hard science” area of inquiry. The metaphysical and philosophical implications of the interactions of these data systems lends itself to the idea that a “spirit world” could indeed exist as a secondary data system overlapping and impinging upon our physical world as a fully realized mechanical process which can be explained in purely rational terms.

The acceptance of determinism in this model counter-intuitively leads to the possibility of a spirit world by substituting purely random systems, which can maintain no data, for evolving quasi physical states of a pervasive medium which would intrinsically store all the physical and electromagnetic interactions of the universe via a process of progressive superposition of states.

INFORMATION THEORY: EXCHANGING QUASI-PROBABILITY FOR CHAOTIC DETERMINISM

In this fluid dynamical approach we must presume that the quasi-probability distribution of the phase space formulation of QM is Bayesian and intrinsically refers more to knowledge level -or lack thereof- than underlying circumstances or mechanics.

In information theory, the highest entropy (Shannon Entropy) and therefore randomness is a measure of the highest information density. According to Jaynes, in his formulation of Maximum Entropy Thermodynamics, Shannon entropy is not simply an analog of thermodynamic entropy but is the superior interpretation of it (Jaynes 1957). This interpretation seems to have arisen independent of a fluid dynamics perspective in which the evolution of a fluid system simply appears chaotic. This interpretation by Jaynes further supports the interchangeability of the statistical quantum paradigm with the deterministic chaos found in fluid dynamics and therefore also supports the neoclassical interpretation.

Furthermore, this Bayesian perspective casts the concept of entropy itself as simply a measure of ignorance and is based upon the level of prior knowledge about a system. This could also be seen as dependency upon or a measure of the complexity of the key. This “key”, of course, is the symbol that has been the nomenclature in this paper used to represent the context built up by a computation system which allows it to interpret a great deal from very little. The greater the complexity of the key, if properly related to the data examined, the greater the ability to interpret meaning from raw or seemingly random data.

Therefore as complexity of interpretive key goes up, entropy goes down. Knowledge directly reduces entropy. Chaos is simply a perception from (and specifically of) ignorance and order is therefore similarly a false perspective illusion. In this paradigm probability itself is no more than a tool for dealing with ignorance. Maxwell’s demon uses information which supposedly increases entropy through gaining and encoding that knowledge but MaxEnt seems to indicate instead a net exchange of knowledge and complexity which then leads to the question of what effect self-knowledge has upon the greater system.

This viewpoint does not cast doubt upon the phenomena of increased complexity which we term chaos and entropy, but instead it simply questions the conception of its irreversibility. Both chaos theory as well as fluid dynamics show methods by which complex small scale systems add together into larger scale systems. This introduction of seeming spontaneous order, is usually mediated via the mechanics of coupled oscillation.

FRACTAL SYMMETRY AND SELF-REPRESENTATION

It has been shown that there is a link between the truncated fractals found in biology and coupled oscillation (Paar et al 2001). The interrelationship between fractal symmetry, coupled oscillation and resonance has been dealt with in general terms by Henk W. Broer (Broer 2012). These relationships in combination with the proposals of this paper suggest that self-knowledge may share some of the properties of other fractals and their capacity to capture contain and combine energy into a more coherent state thereby providing mechanism and additional conceptual process by which knowledge and especially conscious self-knowledge can be seen to reduce entropy.

ARTIFICIAL SEPARATION BY SIZE AND SCOPE OF PHENOMENA

In the interplay between large complex sets of knowledge and their ability to interpret large far reaching concepts from small bit of data, we see the methodology of compression algorithms. These small bits of information, however, in the simultaneous read/write paradigm described, produce large scale changes throughout an interrelated data system much like the butterfly effect. Within the deterministic unfolding of a small bit of data by its interaction with the whole of the larger system, the whole of the larger system is inferred in a hyper-compressed format in that interaction profile. The exact interaction profile at the moment of processing, which could be described at the instantaneous state of the system, represents a compressed version of the larger data set. This interaction profile, in the context of a brain, has been previously termed “a conscious moment.”

In chaos theory we conceptually entertain the smallest scale phenomena affecting and determining the larger scale, yet in other examinations of phenomena we propose that larger scale phenomena affect and determine the outcome of small scale phenomena. This apparent contradiction comes from a non deterministic world-view which leads to artificial separation of interrelated phenomena.

In a deterministic system, only the illusion of separation between smallest and largest leads to apparent self-referential paradoxes which can, instead, be resolved by

simply removing the illusory conceptual separation between events. In a deterministic system, all events in the universe are part of a singular process.

SUMMARY

In the neoclassical interpretation of physics, the fluid dynamical analogs which predict the same phenomena as current discrete treatments represent a deterministic system of non-local hidden variables which determine the outcome of particle motions. Energetic particles themselves and their various multi-dimensional descriptions can be re-interpreted as complex evolutions of the pseudo-chaotic motions of an inviscid superfluid medium. Their probabilistic outcomes are dependent upon the extreme complexity found in the pre-existing state of the system under investigation.

The mechanics of a superfluid medium suggest the possibility that seemingly random fluctuations of the quantum vacuum may, in fact, be related to complex persistent vortical structures in the medium which represent an evolving superposed recording of previous events. This persistent structure and the mechanics of interaction with mechanical waves describes a system of interaction which is proposed as an analog to the processing and encoding of data in human brain.

The existence of this data system and its interaction with the surrounding environment is proposed as a quasi-physical computational system capable of supporting all the processes found in a human brain and is therefore, further proposed as substrate which could support a “spiritual” world in a scientific, mechanical and non-mystical fashion.

This interpretation of physics in combination with an information theory interpretation of consciousness provides a rational basis for scientific inquiry surrounding more mystical interpretations of events and phenomena.

DISCUSSION

The primary reticence of humans in accepting the concept of determinism is the apparent free will of humans. This free will is also closely tied with intent. However, if one believes that the human mind is not a magic black box but is governed by biochemical processes and physics, then one must accept that the origin of intent itself is derived from the combined processes leading up to an event. The very decision to act is the sum of all prior events which shaped the human brain. This includes the instincts developed over millions of years shaping the nervous system to the balance of neurochemicals which are dependent upon recent food intake. The shape of the networks which led to a decision were governed by the inputs of stimuli prior to the event in question.

The misattribution of intent has been one of the largest obstacles to the progress of science and humanity in general. The complexity created by evolution is regularly regarded as requiring intent by many -even learned- people. Yet the same individual that requires intent for evolution can easily see that a simple spider brain can not understand the larger point of weaving a web or have a long term plan for capture of prey. This lack of intent can be seen throughout numerous animals as the simple emergence of complexity through pressures which is an analog of evolution itself.

While a laymen might easily think that a simple animal or insect taught to press a button understands the connection between reward and their actions, a neuroscientist with experience in these matters would not likely make the same mistake in attributing complex intentionality. A large portion of neuroscientists could agree that a bird does not necessarily understand the point of gathering and assembling twigs and does not have the long term planning required to grasp its own actions and their impact on the wider world. At this point however, the smooth transition between an obvious lack of intent and the possibility of intent becomes unclear.

The answer seems to lie in understanding that intent, like the borders of a tornado, may perhaps represent some transitional states but the conceptual localization of the phenomena is primarily an illusion. Intent can then be conceived as having various overlapping and diffuse levels.

In the military, compartmentalization is used to keep individuals unaware of the larger goal their actions are performing. Some simpler people may become abusive to animals which they believe to be purposely defying them, or more complex individuals may recognize a set of behaviors in another human that leads inexorably toward a point of reward for that other individual. The individual examined, however, may only be following the rewards of smaller components of a larger system without being aware of the connections of the larger system. Their generalized desires may lead to specific goals without ever coalescing into specific “intent” in their conscious awareness. There can be unintentional compartmentalization of a given mind which, conveniently can be compared to de-synchronization or lower-level consciousness.

This multi-layered and diffuse model of intentionality leads smoothly to the concept of fractal hive-minds which is a topic that will be discussed in a subsequent paper.

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