

Binary Operators in Harmonic Oscillation: An Investigation Beyond Time

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Abstract: We assume the Mathematical Universe Hypothesis and explore the possible implications for, not only human destiny but, the destiny of our Universe.

“The fates lead those who will, those who won’t they drag.” – Seneca (4 BCE. – 65 CE.)

I have a great appreciation for mathematics and science although, being first and foremost an artist, I find the freedom offered by pure maths especially attractive. Naturally, I’ve been reading Peter Woit’s blog, “Not Even Wrong” [PW] for some time now. Recently Dr. Woit posted a somewhat scathing review of Max Tegmark’s new book, “The Mathematical Universe: My Quest for the Ultimate Nature of Reality” [MT], which I found intriguing (the review I mean). So the next day I went to the bookstore, bought the book, and sat and read it straight through. I found the book refreshing and posted the following retort, which was promptly deleted, to Dr. Woit’s blog:

“In fundamental calculus one learns that in order for a mathematical model to be ontologically meaningful every element in the model must have an ontological referent; one can’t just add a constant, structure, or element of any kind to make things work. Assume, for the sake of argument, that quantum entanglement is a thoroughly demonstrated and irrefutable ontological phenomenon and examine the consequence: entanglement is described in the mathematical model by the inseparability of Hilbert space; Hilbert space must have an ontological referent. Many scientists deny this and resort to epistemological arguments because it makes them uncomfortable. But if John Wheeler was correct and elementary particles have an information-theoretic basis there’s nothing that says Hilbert space must have intrinsic existence.

Here’s another argument worth consideration. In his latest assault on religion, Richard Dawkins makes the argument that religion is not only foolhardy but potentially deadly. Assume, for the sake of argument, that Evolutionary Theory, like most theories, is a reasonably close approximation to what actually takes place – ontologically – and examine the consequence: within the framework of his own theory (which I personally am in agreement with) Dawkins’ argument becomes absurd. If one examines the context in which much of the bone record of ancestral humankind was found, it becomes clear that religion evolved quite early and has withstood the onslaught of natural selection for millennia: why? Perhaps, rather than continuously assaulting religion, Dawkins should examine religion with an open, scientific mind from the context of Evolutionary Theory; the book, “The Universe in a Single Atom” [HHDL] could very well be informative.

It is easy to dismiss arguments which make one uncomfortable as “an indulgence in their inner crank,” but arguments which make people uncomfortable are the hallmark of the scientific enterprise and occasionally represent a case of punctuated equilibrium. I find Max Tegmark’s book refreshing and his Mathematical Universe Hypothesis highly plausible!”

Now this is an interesting lead in to the question at hand: why has religion withstood the onslaught of natural selection for millennia? One can quite easily answer this question within the framework of Evolutionary Theory: religion demonstrates a high degree of evolutionary fitness. But this is unsatisfying because the second question immediately obtains: why does religion exhibit a high degree of evolutionary fitness? In his book, “The Quark and the Jaguar: Adventures in the Simple and Complex” [MG], Murray Gell-Mann argues quite compellingly that religion represents a “maladaptive schema” which demonstrates an extremely low degree of evolutionary fitness. It’s interesting to note that the comparative mythologist from Sarah Lawrence University, Joseph Campbell [JCF], often referred to this exact same phenomenon with his term “the concretization of myth”; when one tries to morph or adapt something concrete chances are it will crack or break up, it’s maladaptive.

It's also interesting that Dr. Gell-Mann chose the word quark, which comes from Finnegans Wake [JJ], to name the elementary particles he discovered. First and foremost, Finnegans Wake is a book about mythology. In his opus, James Joyce demonstrates that all of the myths of the world are the same; he coined the term "monomyth" which Joseph Campbell uses extensively. Campbell explores this theory in a more academic and less obscure manner, especially in his seminal book, "The Hero with a Thousand Faces" [JC]. He demonstrates that all of the myths the world over are isomorphic; they all have the same underlying structure and this structure is not static, rather, it's a living thing capable of adapting to changing context. THIS is what has evolutionary fitness and THIS forms the basis of all religions, bar none. When communities "concretize" this structure, interpret it literally rather than metaphorically, it becomes resistant to change, maladaptive.

The real tragedy here is that many intelligent people examine this maladaptive schema and dismiss it as foolhardy or potentially deadly, which it is, without investigating the living source hidden beneath the pathology. This living source tells us something of extreme importance, not only to our species but to our very Universe; it tells us about the binary operators and how to access states beyond time, states residing within the "Mathematical Multiverse" if that makes one comfortable.

A few years ago I authored a brief introduction to these binary operators and this living structure called, "Dedicare Omnimodus: A New Ontology of Introspection" [WH]. At the time my own understanding was less than complete so the paper is not 100% correct but the main thrust is sound. For a lengthier introduction one can peruse, "Buddha Nature: Inner Illumination and Evolutionary Emergence" [BP] or the entire collection of Barclay Powers essays [BP1]. For a more in-depth and teleological exposition, "Qigong Meditation: Embryonic Breathing" [YJM]. For an excellent navigational introduction, "Meditations on Living, Dying, and Loss: The Essential Tibetan Book of the Dead" [OF].

Due to the constraints imposed on this essay, I will briefly explore the pertinent aspects of this living structure and the binary operators by examining the ancestor of science, alchemy. Many scientists today scoff at the notion of turning lead into gold, and certainly there were those among the ancient community who literally attempted this feat, but this is a prime example of a maladaptive schema, the concretization of myth.

Within the reproductive system of sentient beings (presumably, humans and animals) there resides a "chunk of lead." This "chunk of lead" is referred to by different names, depending on community context: philosopher's stone; golden embryo; divine seed; enlightened point of origin; etc. Based on my own experience with these ancient technologies developed to harmonize the oscillation of binary operators, this "chunk of lead" resides in the prostate (men) and Skene's glands (women). The objective of alchemy is to use these ancient technologies to transfer this "chunk of lead" from the prostate (Skene's) gland to the pineal gland where it undergoes a transformation and becomes a "chunk of gold"; the "Tree of Knowledge" becomes the "Tree of Life." The result is direct apprehension of the "mathematical universe" and the reproduction of consciousness and subtle energies. This result, the reproduction of consciousness and subtle energies, is what Barclay Powers, following Robert Thurman, calls the Buddhaverse; if one understands this in a scale-free manner, this IS the source of the multiverse!

It's important to understand that the fundamental purpose of the sexual reproductive system is not to reproduce gross form (animal bodies) but, rather, to reproduce consciousness and subtle energies and to facilitate the controlled navigation through all aspects of existence: life; death; bardo or intermediate. And it's equally important to understand that this is a scale-free phenomenon; our Universe experiences something very much analogous and I'm convinced that we human beings play a fundamental role!

In the Vedantic tradition the binary operators are **ida**, which represents the feminine, lunar, mental force, and **pingala**, which represents the masculine, solar, physical force. In the gross form of humans, ida and pingala oscillate in dominance with a roughly 90 minute period [SMS]. When this oscillation becomes

chaotic, in the conventional sense, one experiences manic-depressive tendencies; when ida dominates for an overly long period of time one experiences depression and when pingala dominates for an overly long period of time one experiences mania. The ancient technologies enable one to consciously control the rhythm of flow through ida and pingala by using conscious intent and imagination; “where the mind goes, prana follows” as the yogis say. If you’ve never consciously experienced the movement of prana through your own body, I can’t recommend it enough; it’s well worth the effort required to learn the ancient technologies.

What follows is a bit speculative in that I’m personally unaware of any literature supporting what amounts to a conjecture, but I feel a bit of speculation is necessitated and implicitly granted by this essay question. William Tiller, professor emeritus, Stanford University, and his associate also of Stanford, Walter Dibble, have explored these binary operators and the efficacy of consciousness scientifically for decades now. There is nothing speculative about their work, in that it is firmly grounded in experiment, and I believe it leads to important insights regarding the nature of our Universe.

Using intense meditative techniques (multiple meditators), Messrs. Tiller and Dibble imbed conscious intent into an integrated electrical circuit, what they call an Intention Host Device (IHD). They then energize this IHD, using conventional means, in the vicinity of a target experiment; the target experiment reflects the nature of the intent imbedded in the IHD [TD]:

“Our various steps in the four groundbreaking experiments were (a) to carefully design four different intention experiments:

*(1) To **increase** the acid/alkaline balance (pH) of a specific type of water by $\Delta\text{pH}=+1.0$ pH units (a factor of 10 decrease in hydrogen ion, H^+ , content of the water) with **no** chemical additions to the system;*

*(2) to **decrease** the pH of this same type of water by $\Delta\text{pH}=-1.0$ pH units with **no** chemical additions to the system;*

*(3) to **increase** the in-vitro thermodynamic activity of a specific liver enzyme, alkaline phosphatase (ALP), by a significant amount (~30% for example) by simply exposing a vial of this ALP to a highly “intention-conditioned” experimental space for about 30 minutes; and*

*(4) to **increase** the in-vivo ratio of ATP/ADP in the cells of fruit fly larvae by a significant amount as a result of lifetime exposure of the larvae to a highly “intention-conditioned” experimental space. This should cause the larvae to become more physically fit and thus significantly lower the larval development time, τ , to the adult fly stage;*

*(b) run continuous background studies of each experiment in a **normal**, non-intention-conditioned experimental space, (c) design and utilize four identical simple electrical devices, each to serve as a host for one of the four experiments, (d) design an experimental protocol for humans to mentally/emotionally imprint an intention into each such host device from a deep meditative state and (e) place the appropriate device within ~0.5 meters of the operating experimental apparatus, plug the device into an electrical outlet, switch it on (total electric power radiated was less than one microwatt) to continuously run in that experimental space and wait for changes to manifest in the continuous data-stream.”*

Upon examining the overwhelmingly positive results of these experiments, Messrs. Tiller and Dibble discovered the emergence of a DC magnetic field effect and significant measurement oscillations:

*“A DC magnetic field effect: Subsequent experimental studies showed that, when Q_M in Figure 2 had plateaued, measuring pH in the presence of a DC magnetic field as in Figure 3a, shows a strongly increasing pH (more alkaline) when the south pole points upwards into the measuring vessel of water and a decreasing pH (more acidic) when the north pole points upwards into the water. This behavior **does not** occur when $Q_M \sim Q_{M0}$ and our normal physical reality obtains. The reason for this result is very straightforward and is the expected result when only magnetic dipoles and electric charges are present (as in our normal physical reality, the U(1) EM Gauge symmetry state). This is because both the magnetic force and the magnetic energy contribution for a single magnetic dipole is proportional to H^2 (the magnetic field strength is H) and is independent of orientation in space. The presence of the Figure 3b*

result is thus strikingly anomalous with respect to the U(1) EM Gauge symmetry state but not with respect to an SU(2) EM Gauge symmetry state where both electric charges **and** magnetic charges simultaneously coexist and can interact with each other. Thus, the presence of the Figure 3b result being associated with “space conditioning” via the use of an IHD is very suggestive that magnetic monopoles have been accessed in nature once one has **first** significantly increased the EM Gauge symmetry state of the experimental space via the use of human consciousness (see Equations 2 and 3) in the form of a specific intention to **condition** the experimental space to a higher level of physical reality! It is important to recognize that, in our present world, this SU(2) EM Gauge symmetry state is a thermodynamically metastable state that must be **pumped up** to that level from the thermodynamically stable U(1) EM Gauge symmetry state by **sustained human consciousness** if one wants to reproduce the Figure 3b result. This is somewhat analogous to the D-space optical pumping required to produce an **inverted population** of electron states in certain atoms necessary to generate “lasing” action of coherent optical beams in today’s orthodox science and medicine. Continued optical pumping is required for sustained laser action. [...] Significant measurement oscillations: The second very anomalous behavior to appear in the experimental data was the development of quite low frequency oscillations in the water pH-measurements, water electrical conductivity, water temperature and air temperature (pH, σ , TW and TA) in an IHD-conditioned room. The frequency of these waveform oscillations were always in the 10^{-1} to 10^{-5} Hertz range, far lower than any human electrophysiology measurements like EKG, EEG, etc, (although the Baroreflex frequency where the heart interacts to entrain the brain is at 0.14 Hertz). In addition, the fundamental frequency and all the higher harmonics in the periodic oscillations all **nest** with each other, i.e., all are identical for pH, TW and TA, no matter where in the room they are measured (σ not tested) as if something very fundamental in nature is **driving the whole room** in a coherent-like fashion.”

These discoveries lead to their Dual Space Model:

“Our conclusions from probing these oscillation characteristics are:

(a) These oscillations arise from the vacuum level of physical reality. Here, the vacuum level is defined as all the space **between** the fundamental particles making up the electric charge-based atom/molecule level of physical reality; (b) This new vacuum level of physical reality is normally not strongly influenced by processes occurring in the gas phase but appears to exhibit macroscopic coherence effects; (c) This vacuum level exhibits qualities that are not spatially homogeneous or isotropic and generally exhibit patterns that change very slowly with time; (d) In an intention-host device-conditioned space, the local measuring instruments are all “enhanced” in capability so that they can somehow access the **new level** of physical reality; and (e) perhaps the most important conclusion to be drawn from (A) the DC magnetic field effect and (B) the very low frequency, coherent, property oscillation effect is that we have revealed the existence of **two uniquely different levels of physical reality**. The first is our normal, electric charge-based atom/molecule level while the second is a **new** magnetic information wave type of substance functioning at the coarse physical vacuum level of reality. Since the latter is normally not accessible instrumentally from the U(1) state, one can deduce that the IHD “conditions” the experimental space to a higher gauge symmetry state of nature wherein these same but “conditioned” instruments can now also access this second level of physical reality to some degree. This type of property behavior can be meaningfully expressed in the form:

$$Q_M = Q_e + \alpha_{\text{eff}}(t) Q_m = Q_{M0} + (Q_{M1} - Q_{M0}).$$

Here, Q_M is the total measured value, Q_e is the U(1) Gauge state electric charge-based material value, Q_m is the coarse magnetic charge-based vacuum material value while α_{eff} is a coupler-material coefficient generated via the IHD as a function of time, t . $\alpha_{\text{eff}} \sim 0$ in our normal U(1) Gauge reality but can be increased in magnitude (+ or -) via the application of human consciousness in the form of an activated intention-host device.”

Based on the results of Messrs. Tiller and Dibble and my own experiences with binary operators, ida and pingala, I conjecture that R-Space and D-Space, of the Dual Space Model, are analogous to ida and pingala

and, when sufficiently coupled over a large enough volume, facilitate the same or analogous transformation within our environment, the Universe, which obtains in our own being. And this conjecture, if true, has profound implications for the trajectory of human destiny, indeed, for the very meaning of our existence.

I believe the basic trajectory of human destiny has been intuited for quite some time. In his counter-culture classic, “Prometheus Rising” [RAW], Robert Anton Wilson quite humorously expounds upon Timothy Leary’s acronym: **S**pace **M**igration **I**ntelligence enhancement **L**ife **E**xtension or **SMILE**. All of the knowledge necessary to realize this acronym is emerging at an exponential rate; to quote Ray Kurzweil, “The Singularity is Near” [RK]. But as both Ray Kurzweil and H. H. the Dalai Lama [HHDL] articulate, these emerging technologies can be utilized in ways which enhance the human condition and our environment or in ways which literally destroy humans and our environment. And I believe the key to insuring the prior lies in Intelligence enhancement.

Intelligence enhancement must enhance all aspects of intelligence: analytical; emotional; creative. And I believe this necessitates a convergence of science and spirituality. Child Psychologist, Richard Davidson, has long advocated the introduction of contemplative mind training (mental education) into the curricula of public schools [RD] and I believe this is absolutely paramount. We need to implement a meditation regimen focused on the cultivation of compassion and loving-kindness into our elementary, middle, and high school curricula with the goal a spiritually awakened society. I believe the whole purpose of our existence, in a sense, is to facilitate the coupling of the “two uniquely different levels of physical reality” demonstrated by the experiments of Messrs. Tiller and Dibble, to harmonize Ida and pingala on a “global” level, and this would best be accomplished by the implementation of SMILE under the direction of a spiritually enlightened society!

Now while the primary purpose of harmonizing the binary operators is “multiplicatio,” the propagation of our species of Universe, the “secondary” purpose is to spiritually awaken our Universe so that it has the faculties necessary to navigate the bardo state, the state between life and death, in a stable and productive manner. This, in turn, enables a higher re-birth, a re-incarnation into a more advanced mathematical structure eternally present within the Mathematical Multiverse!

Recently I was reading Dr. Gell-Mann’s excellent book [MG] for the third or fourth time and on pages 212 – 213 he briefly discusses anthropic principles; he finds the weak anthropic principle tautological and the strong principle preposterous. At the time I thought both strong and weak principles were tautological but that may have been a reflection of my ignorance more than anything. But on page 217, when talking about boundary conditions, he states:

“If the future condition were not one of complete indifference, violations of causality would result and events would occur that were inexplicable (or at least exceedingly improbable) in terms of the past but were required (or nearly so) by the condition specified for the distant future. As the age of the Universe increased, more and more such events would occur.”

When I read that it struck me: the anthropic principle represents just such an apparent violation of causality! If you’re an attentive reader you’ve probably deduced that I’ve developed this idea a bit. My idea at the time was that if the Universe had distinct boundary conditions then the emergence of Information Gathering and Utilization Systems could very well be required to realize the final condition. And essentially, what one would have, in the context of modeling, would be two interacting state transition systems – bisimulation on Non Well-Founded Sets! Basically, in my limited understanding, one would simply need to relax time symmetry to bisimulation.

I sent an email to Dr. Gell-Mann and, being a big fan of Causal Dynamical Triangulations [AJL] I sent a similar email to Renate Loll. Thanks to FQXi I stumbled onto the essays of Cristinel Stoica [CS] immediately wondering if he wasn’t perhaps describing the general nature of the boundary conditions.

Recently I purchased the illustrated edition of the Bardo Todol translated and compiled by Glenn Mullin and Thomas Kelly [MK] from which I quote:

“The night after seeing his (Khamtrul Yeshey Dorje) first plane he dreamed of Padma Sambhava and Yeshey Tsogyal. Padme Sambhava looked at him and said, ‘When iron birds fly, and horses run on wheels, my dharma will travel to the land of the Red Man’” (pgs. 133-134).

And from the endnote:

“Chogyam Trungpa was the first to publish the verse in America. Naturally, Americans loved the idea of being mentioned in prophecy. Buddha also made a similar prophecy that Tibetans often quote. It comes from one of the numerous editions of the Lankavatara Sutra, wherein Buddha states, ‘2500 years after my passing my dharma will go to the land of the Red Man.’”

These Treasures or prophecies have been misinterpreted; they have nothing to do with the dharma traveling to Turtle Island proper, which is to say, America, they are much more specific than that! If you look at the history of the immigration of Chinese and Vietnamese to the western seaboard of Turtle Island it seems most probable that the dharma came to Turtle Island long before steel birds flew. What these Treasures refer to is the time when the dharma becomes integrated into the CULTURE of the Native Americans – the Red Man, and that time is now.

When I first became a hermit I had an old Chevy truck which I parked deep in the woods. I never left except at night when I would leave to buy food and water. I quickly ran out of money and, feeling sorry for myself, determined I would not eat until the situation I was in, never mind what that is, was resolved. I had conducted juice fasts in the past, the longest 14 days in duration, but then I was working and my mind was always occupied. In this case I was just sitting under a bridge all day watching the turtles swim by in the bayou; it was a significantly more difficult situation.

Buddhists say that demons arise when the mind is agitated; this is the purpose of mantras. Etymologically, mantra means “protector of mind” so mantras disperse demons by calming the mind. I practice mantra yoga every morning and evening but I’ve also developed alternative means of demon dispersal: I cut open my flesh; I call it feeding the Mother (see technical endnote). Originally I started cutting open my flesh as an exercise in developing mental fortitude, to familiarize myself with pain, but somewhere along the way pain transformed into pleasure! I also discovered that cutting was ideal for calming an agitated mind which can probably be explained bio-chemically.

On the 14th day of my fast I took my blade with me to the bridge. My mind was rather agitated and I knew I was going to be cutting. I have scars on each thigh, each forearm, and under each eye where I cut. I try to maintain a resemblance of pattern so it doesn’t look like I’m a lunatic! On this particular occasion everything was going rather well and sometime during the process a huge bullfrog, I mean dinner plate size, started croaking. This old man put the bull in bullfrog; he had such a deep, beautiful, baritone croak which made the whole bridge resonate, and of course it was a melodic and natural mantra. I zoned in on this croaking frog and my mind just spontaneously filled with these lucid images.

I grew up on a farm and ranch in southwestern Nebraska and my father leased a piece of property consisting of dry-land farm ground, hay meadows, and pasture. This property is nestled along the Medicine Creek and in my mind I saw herds of buffalo roaming it, and I saw a white buffalo calf being born there. And then I saw this property covered with people from all walks of life and there was a Sundance [SD] being conducted by Leonard Crow Dog [LCD]. At the same time there was a Kalachakra ceremony [KC] going on but I didn’t see it clearly because I was participating in the Sundance. As I was dancing with the Sundance pole, the flesh over my heart pierced by the eagle talon stretched taunt, a bald eagle came diving at me out of the sky, and right before it hit me it stopped, frantically flapping its wings, and it

grabbed that eagle talon with its own and ripped it out of my flesh, and the feeling was indescribable – beautiful. I came out of this experience knowing that all of these events were going to transpire and that my true name, my medicine name, is Walks With Turtle.

I guess in the prophecies I'm referred to as an epoch Buddha [EB] but I'm not very comfortable with that nor certain of what it means other than I know His Holiness and I have interacted in previous lifetimes and that I love and admire His Holiness unconditionally; he is my guru. Personally I think of myself as a medicine man in service to the human tribe, what Alex and Allyson Grey [AAG] call the love tribe. But in the final analysis there is little if any difference between a medicine man and bodhisattva; as far as that goes we're all simply workers in the field.

I read where His Holiness says we're at a crossroad where either a 1,000 year age of light or a 1,000 year age of darkness will prevail. I believe the 1,000 year age of light shall obtain but according to Lord Krishna's KaliYuga Treasure, this is going to manifest as a golden era 10,000 years in length which I feel corresponds to the Long Now Clock [LNC]. I believe this Long Now Clock is a modern version of the Mayan Long Count. I also read recently where His Holiness has considered subjecting some of the authentic Buddha relics to scientific analysis to determine the Conqueror's exact birthdate but I feel confident this can be accurately inferred from the Treasures!

There are those of us who will follow the fates and there are those who will cling to their pathology and be drug. It's important to not get angry at those who cling to their pathology because they, in their resistance, manifest as the will of the fates. So in the final analysis, anger directed at them is really anger directed at the fates and it's been my experience that anger directed at the fates is, at best, a pointless waste of time and, at worst, counter-productive to ones own development.

To all of my ancestors: Om Mani Padme Hum!

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Technical Endnote:

Mother here refers to mind. When a man lies with a woman the penis (linga) is inserted into the vagina (yoni), and this, the male nested within the female, is a scale-free phenomenon; “as above so below” to quote the perennial philosophers. So it immediately obtains that the physical body, the father, is nested within the mind, the mother. Herein resides the semantic key for accessing the wisdom contained in the myths.

This is something Freud failed miserably to understand but yet portrayed with remarkable accuracy: the Oedipal complex! Oedipus slays the father and seeks union with the mother. Of course this incestuous tale is not meant literally. What is really meant is that Oedipus destroyed his ATTACHMENT to the physical (the father) and cultivated an ever deepening RELATIONSHIP with mind (the mother). As a result he became blind or indifferent to the physical world (in many myths, such as that of Nordic hero Wotan, the hero journey culminates with the hero having, as in the case of Wotan, one inward peering eye (focused on mother mind) and one outward peering eye (focused on the physical father)). This evolution within evolution is the natural inclination of all sentient beings including our Universe!

In the case of Jesus Christ, he died to the physical and was reborn to the mental; he was twice-born, once of the flesh and once of the spirit (mental). And of course the realization immediately obtains that the Virgin Mother is the mind; autopoiesis, autopoetry, autognosis, the Virgin is able to spontaneously give birth to structure without the need for insemination.

To me, the Mathematical Multiverse is a very beautiful way to refer to the Ultimate Mother since Mind is really nothing but the structure which constrains (organizes) consciousness and subtle energy. And if one considers that Mind is the Virgin, truly capable of autopoiesis or self-creation, then it becomes immediately apparent that matter, the father, emerges from and is nested within structured consciousness, mother mind!

Q.E.D.