

Essay 2 - The Essence of Matter - By Rajiv Pande

Section One

“Reality happens when we look at it” – Danah Zohar in “The Quantum Self”

There are two parts to this statement that we need to examine. The first is the word “happens”, so that we are talking about the occurrence of an **event**. The second is “when we look at it” – which means an active, conscious observer is involved in identifying, discerning or noticing this event. I say “active” and “conscious” because the identification of any event is an **action** by an observer and “conscious” because the rolling of a videotape in a twenty four-hour surveillance camera is NOT an active observation.

Now there is no such thing as an observation without some interpreted significance inseparably attached to it, howsoever trivial¹. The whole world may be spewing out billions of “potentially observable” events by the second, with millions of these in our immediate sensory environment, but no “potentially observable event” actually becomes an event without the lawful consent of a conscious observer. Conscious observation therefore brings about separation by way of distinction and discrimination, and consciousness is very selective about what events it chooses to “bring into” the world of its own “natural”² order. Since the observation (of an event) and its significance are inseparable, I would like to define “perception” as a word that combines both into a singular action. Thus, observation + interpretation or observation + significance or observation + relevance to the context – all these are equal to Perception.

When we look at a clock and say, “It is four PM”, it is an active and conscious observation. “Four PM” is significant to us and it is an “event” that will determine our future course of action, howsoever trivial:

“It is four PM, let’s go home”

“It is four PM, time for tea”

“It’s just four PM. (Yawn). Still an hour to go”

But the clock itself does not have any events “inside” it or even packed end-to-end on its dial second-second, minute to minute and hour to hour. It is just a continuous circular motion, mute and impersonal so that its hands just keep going round and round and round until the battery runs down. The event “Four o’clock” is something that we shall refer to as being “ek-static” in relation to the clock – where “ek-static” is a word used in the original Greek sense of “standing out from” and which I will henceforth spell as **ekstatic** in order to distinguish it from “ecstatic”³. Now look at the sunrises and the sunsets, days

¹ Just to further clarify the importance of understanding “conscious” observation - if the 24-hour surveillance camera were to be hooked up to a computer device that triggers an alarm bell on detecting some movement, this is still not a conscious observation even if it appears to have the “significance” component attached to it.

² Though it may seem to be a natural order outwardly, inwardly it is not truly natural in the sense of being universal, but natural in the sense of being **native** to a specific consciousness

³ Though the origins of the words are identical, ecstasy almost always refers to a state of great joy or happiness – and we do not need that association here.

rolling into nights and nights rolling into days; look at the seasons - with autumn blending imperceptibly into winter and winter to spring, spring to summer. Look at the entire Universe of motion as a giant monolithic clock that has not just two or three measuring hands as does a clock, but as many hands as there are diverse motions each “keeping time” in synchrony with the rest of the giant and complex clockwork. Comets flash past in a blaze of glory, stars explode or collapse into black holes, asteroids collide with planets or moons and create huge dents and craters, yet every motion in the universe continues to remain delicately balanced in a perfect equilibrium, right from the darting of the tiniest speck of dust in a little gust of wind to the imperceptible rotation or drift on an entire galaxy, perfectly synchronized and “interlocked” like the delicate cog wheels in a precisely engineered Rolex watch.

Before the Physics of Einstein impulsively interrupts our thoughts on this idea of synchronicity of all Motion in the Universe, let me remind the physicist that I am not talking about “Action” at a distance but only about Pure Motion – about the causal relationships that are infinitely sub-divisible into sub-causes and sub-sub-causes endlessly and forever. The relationships between Motions are so intimate that all of Motion – the Universe of Motion - may as well be given as a single monolithic block – and no single motion can be identified as being the precipitating cause nor the resulting effect⁴ of any other motion. “Action-at-a-distance” is limited to the dynamics of identifiable and therefore discrete events, but in the Universe of Motion there are neither any identifiable nor discrete motions – or rather that any such identification or ‘discretisation’ is strictly prohibited. This is expressed in the example of the clock above, where we have said that the clock does not “contain” time – but when we make an observation of its hands, we obtain a discrete event called “Four o’clock”. So just as the event “four o’clock” is ekstatic in relation to the clock, so also any locally observed motion is ekstatic in relation to the Universe of Motion.

From our tiny little local perspective on a tiny little planet located at the corner of some galaxy called the milky-way, we see a comet whizz past in the night sky and say, “Ooh! How beautiful! ”. It’s a great event for us – for scientists and mystics alike but for the Universe itself it is nothing much at all. The Universe has seen it coming for centuries, even eons, even before life began on earth, yes, even before the comet itself was born – and the Universe is never surprised or amazed at itself and remains unmoved and indifferent to such things that we purport to call “events”

To understand the meaning of the word Universe, we must understand it as a totality, as an absolute self-sufficiency, and as absolutely indifferent to our local notions of change⁵. We may be surprised, we may be inspired to wonder and imagine at the kaleidoscope of changes that we see unfolding before us, but the Universe itself is utterly unmoved and unimpressed by our excitement. This is because nothing that changes in the Universe changes suddenly or unexpectedly. Every fraction of change can be subdivided indefinitely into still tinier fractions of change that caused that change, endlessly and forever until the limit of zero. This infinite sub-divisibility of motion (also referred to as Causality or Will) makes the Universe a Continuum of Motion – absolutely deterministic and absolutely isomorphic.

⁴ It may be interesting to note that “precipitating” cause and “resulting” effect are interpreted “significances” that are tied up with our perceptions of things. In the absence of an interpreter, there really are no such notable causes or effects.

⁵ I like the way one of my friends [Stephen Paul King) defines “change” - as a “difference that makes a difference”

Does it not follow then, that an unchanging universe, with nothing to mark out or distinguish one point from another, nothing to differentiate one cycle from the next, doesn't it follow that such a Universe is timeless and, despite its continuous motion, is eternally at rest?

The Continuum Theses of Motion and Space

The Universe is infinite. In fact, that is the very meaning of the word "universe" in that it contains everything. It is a wholeness, a totality, a completeness with nothing "left over", nothing that it excludes. Yet Infinity, as a word, does not directly give us this idea of wholeness. The better word is "continuum" which combines the properties of wholeness and infinity into a single and meaningful unit. Infinity is suggestive of very large extents, very large numbers or very large measures. The impossibility of "measuring" infinity or including infinity in mathematical methods leads to any number of paradoxes a few of which are the ancient Zeno's paradox and the Continuum Hypothesis of modern set theory of Georg Cantor which is as yet unproved – largely because the concept of infinity cannot be properly handled by mathematics nor by set theory.

Instead I propose the "Continuum Thesis", which simply means, in the literal sense, a formal presentation of the nature of the Continuum

The continuum thesis states that:

1. A Continuum is given entirely or not at all
2. Every point (or part) of a continuum is the whole continuum and thus every point (or part) of a continuum is an identical point (or part)

Also, a continuum as a universe is inclusive and there can be no manifest perspective outside of the continuum by which its states can be observed to change. Thus it is not only isomorphic within itself but isomorphic despite possible changes in its states, because there is no manifestly legitimate position by which any changes to the totality can be verified as being changes.

One more interesting feature is that the universe as a continuum is neither creatable nor destructible. If the Universe as the scientists say was created by a phenomenon called the Big Bang, and we pursue them a little further and ask how the Big Bang happened – they attribute this to some vague metaphysical word called a "singularity". Other than actually using the word God, they will use any other word that they deem fit as conforming to their "scientifically respectable" terminology.

However the Continuum Thesis as applied to the Universe can, amazingly, even account for the existence of singularities. A continuum does not require extension to prove that it exists – but can exist even as a point – a perfect zero. The Universe of Motion from the perspective of the Continuum Thesis existed before the Big Bang and gave the appearance of extension after the Big Bang because we "saw" material bodies moving but the isomorphism of the point continuum and of an extended continuum remains intact and undisturbed. Big Bang or no Big Bang, the continuum thesis tells us, nothing happened at all, nothing changed.

But then one wonders. An entire Universe can be born or not, and still this is no change at all? In an absolutely continuous universe does anything change at all? What exactly do we mean when we say that something has changed? When we feel hungry, we feel the change, and when we eat to satisfy our hunger we feel the change. Is this movement from hunger to satisfaction a part of the same unchanging continuum? So is this change real or just an illusion of our experience? What then do we say about Danah Zohar's statement that "Reality happens when we look at it"? What is this thing called a "happening"? And why is "happening" so intimately tangled with the observer who observes it happening?

If Motion is a continuum, I take Space as another continuum. These two together were the foundations of Newtonian Physics as "Absolute Space" and "Absolute Time". It is not at all a problem to look at Absolute Time as the Universe of Motion as I have described above. The time of physics is a time-in-terms-of-motion, and it is important to note that the kind of time used by physics today is not Absolute Time or Universal Time but time in terms of some material motion – in terms of the motion of some material bodies and this makes it local to some frame of some observer and relative in terms of other such possible frames. It is a gross misunderstanding of Newton's absolutes as well as Einstein's relatives to think that Einstein and Modern physics in general "rejected" or "trashed" Newton's absolute space and time. The truth is that Absolute Space and Time as Continua; and being subject to the Continuum Thesis, are inaccessible to any sort of mathematical treatment. This does not necessarily disqualify them as being "unscientific" in any way. If absolute space and time are disqualified, as continua in themselves, then even Einstein's Space-Time continuum (in its mathematical aspect) can be trashed by applying the continuum thesis. Since the continuum thesis states that every point in a continuum is an identical point, then NO two points in Einstein's space-time continuum are allowed to be distinguished. If 't' represents a point in time and 'x' represents a point in space and if one point in Einstein's space-time continuum is called (t1, x1) and another is called (t2,x2), then this is a distinction that is prohibited by the Continuum Thesis. No event can exist in a continuum as manifestly distinct from within the continuum or from any other event within the continuum⁶.

One of the immediate consequences of this absolute determinism that is implicit to the continuum, is the question of free will. Can any action of ours, as conscious agents, be distinguished from the universe of motions as belonging exclusively to us? The answer is "Yes". Despite the determinism of the continuum of Motion, my Action is most certainly my own. Does not this distinction between Action as a "voluntary" motion and the universe of motion in which my own action is infinitesimally dissolved, does

⁶ To carry the attack still further, the Real Numbers themselves should be prohibited from being used as measures for quantifying the various parameters and variables within physics. The Real Numbers are a Continuum of numbers and thus do not lend themselves to the purposes of measurement of physical quantities. However, the basic dimensions of physics – those of Mass, Length and Time are expressed as Real number lines. Physics must therefore be cautioned that this is solely and expressly for the purposes of evaluating continuous functions and that Real Numbers (contrary to the description of "Real") do not *really* exist in Nature. The continuum thesis also dismisses Georg Cantor's continuum hypothesis about the "cardinality" of the set of real numbers and the set of integers – but that is not relevant to our current subject and so we shall set it aside for the time being.

this not bring about a distinction between motions as voluntary and non-voluntary? A leaf that falls from a tree into a pool below causing ripples to appear on its surface is a pure (non-voluntary) motion, but my action of throwing a stone into the pool and causing a splash is not. I know “from the inside” as it were that “I” threw that stone and nobody and nothing “caused” me to throw it. Being uncaused, as I believe it to be, it was an utterly free action – even though it may appear to the Universe to be just another indistinct motion within the whole continuum of motion.

So how does one reconcile “voluntary” motion, as Action, with non-voluntary motion keeping in mind that the continuum thesis prohibits such distinctions? One way, which, to me, is the easy way out or the convenient escape route is to regard this sense of action or agency or volition or intention as an “illusion” so that this attitude claims that there really IS no action, it is all the same continuum of motion. Yet the “vital” (literally – as pertaining to life) difference is **experience**. We are able to *experience* Action and recognize the mechanisms of our own bodies as our own experience of these motions. It must follow then that while our action itself is a part of the universe of motion, our *experience* of action has no place *in the universe of motion*. Not only do we recognize our actions as our own experience, we also recognize our intentions as originating entirely from within us. Even a trivial and non-consequential action like throwing a stone into a pool of water, simply because we felt free to do this, is a recognition of this inner freedom that only we, as individual “I”s can relate to. Neither the second person perspective (“you”), nor the third person perspectives (“he/she”), are in any position to experience what “I” experience in the first person and therefore are in no position to distinguish between my action from any other kind of non-voluntary or mechanical motion. Perhaps “you” (or “he/she”) may infer from my bodily structure some human likeness and infer that I may have experiences of my own that you are not aware of but are willing to respect – but there is no way that you (or he/she) can directly verify that I have experience of my own actions.

No philosophy and no science has ever treated experience other than from the third person perspective. This is natural and not surprising, nor is it to be regarded as a “flaw” within science and philosophy because both of these attempt to describe the world in terms of forms and structures and the dynamic relationships between them in a Universal or generalized system – they are never in any position to talk about feelings or experiences (in the personal sense). Yet without accounting for the first person perspective of “I” and its special world of *experiences*, both science and philosophy will always be incomplete.

Spinoza: (as described by Will Durant – p176, The Story of Philosophy)

“Neither is mind material, answers Spinoza, nor is matter mental; neither is the brain-process the cause, nor is it the effect, of thought; nor are the two processes independent and parallel. For there are not two processes, and there are not two entities; there is but one process, seen now inwardly as thought, and now outwardly as motion; there is but one entity, seen inwardly as mind, now outwardly as matter, but in reality an inextricable mixture and unity of both”

Here, for the first time I can see a philosopher who is able to see the relationship between Mind and Motion. I have long argued that the “substance” of Mind is Motion, and Motion, being a continuum, is

Universal and not personal. Just as the Body is extended in (the continuum of) Space, the Mind is extended in (the continuum of) Motion. Yet, being continua, neither the body, nor the mind can break the continuity. This means the body is not like an object immersed in water and which displaces the water, so that a discontinuity appears in the continuity of the water – but the situation is a little more complex as we shall soon examine. If that is the case, then one wonders why we, as “selves” have our conscious awareness limited and confined to some very local region of space called “My Body” or some very local region of Motion called “My Mind”. What gives rise to this boundary that limits our experiences to a very local frame of reference whose origin (center) is the “I”? Science, philosophy and even religion have always spoken of some sort of universality – be it as Spinoza’s “single substance”, Schopenhauer’s “Will”, or the “Omnipotent, Omnipresent” God of most religions, or the more neutral Hindu concept of the all pervasive “Brahmin” or Science’s undying faith in the determinism of what it calls the “The Laws of Nature” or the “The Laws of Physics” which apply equally to everything everywhere. I may re-iterate here that it is always easier to talk about, to understand and to accept this Universality from a third person (or objective) viewpoint, but to account for the experiential world of the first person, the “I” who is the center of its experiences, is difficult to include in this Universal framework.

For example Will Durant has this to say about Spinoza’s ideas: (p178-179)

“Every instinct is a device developed by nature to preserve the individual...Pleasure and pain are the satisfaction or hindrance of an instinct; they are not the causes of our desires, but their results, we do not desire because they give us pleasure; but they give us pleasure because we desire them, and we desire them because we must

There is consequently no free will; the necessities of survival determine instinct, instinct determines desire, and desire determines thought and action....’There is in the mind no absolute of free will; but the mind is determined in willing this or that by a cause which in turn is determined by another cause, and this by another, and so on till infinity.’ ‘Men think themselves free because they are conscious of their volitions and desires, but are ignorant of the causes by which they are led to wish and desire’ Spinoza compares the feeling of free will to a stone’s thinking, as it travels in space, and determines its own trajectory and selects the place and time of its fall.”

While the above gives the appearance of truth in its outward form – i.e. in its universalized, generalized or impersonal form, we can straightway detect some inherent “self-referential” statements that emerge from the error of taking the first person perspective for granted. The hidden “first person” elements in the above, which Spinoza, like any other “good” philosopher or scientist will almost predictably overlook are as explained below:

1. *“Every instinct is a device developed by nature to preserve the individual”*. Here we see a covert or “subjective” reference to Intention or Purpose that is not accounted for in the objective picture – or is even contradicted by the objective viewpoint. We are “reading between the lines” as it were, and in a form that appeals to our *personal* viewpoints of intention and purpose – something that allows us to give *meaning* to this otherwise indifferent and absolutely

deterministic universe, something that allows us to ask “Why” it all must be so and nothing else. If Spinoza asserts that there is no definite cause nor any definite effect within this continuum of the “single substance”, we must then set aside “intention” or “purpose” – and conclude that they play no specifiable role in this continuum that is his “single substance”. Yet, he contradicts himself by stating a purpose “*to preserve the individual*”. Necessity has acquired a special status as being distinct from causality in some way.

2. Again, “*the necessities of survival determine instinct*”, and we must ask, “Why”, why must we survive? Why has the word “survival” acquired a distinctly privileged and metaphysical quality in the midst of this purely objective and physical universe. I hope the reader has understood that in a causal continuum there is no place to insert our “why” questions, no gaps, no chinks in the armor of this absolute and mechanically perfect determinism

Before the third person perspective – the immutable mechanical causality - of the scientist or philosopher can dismiss our “why” questions as trivial and impertinent, let us see why they are neither trivial nor impertinent.

Freedom is the first requirement of Control. If there is to be any control in the world then it must have its source in Freedom. There is nothing in Spinoza’s impersonal Universe (or for that matter in Science) that allows for any self-regulation to occur; neither in the impersonal universe nor in the personal life of the individual – other than the unfounded assumption, in Spinoza, of some “necessity” to survive. I say it is unfounded because this “necessity” appears to have a privileged position that only a living organism can relate to as being an important aspect of its life – that is, from a personal or “first person” viewpoint. Necessity cannot be in-built into the Universe itself because then it would lose its privileged position as “necessity” and blend and dissolve and eventually disappear infinitely into the continuum of causality. We therefore have no right to appeal to necessity if we are going to strictly confine ourselves to the third person perspective of impersonal causality.

To re-iterate this very important point, necessity has been differentiated from causality, even if necessity and causality are determinants of the same order and treated at the same level of standing as far as their role in the animation of the universe goes. So why then is “necessity” any different from causality, why this special privilege?

If this is clear so far then at this juncture, I shall introduce what I call “The Law of Self-regulating Systems”:

1. Every Living Organism is a Self-Regulating system
2. No system of Self-Regulation can have the Regulating Element incorporated within the system itself.

The immediate implication of this Law is that for any system of control (or regulation) the controlling element cannot be a part of the system it is controlling. If the controller or regulator is incorporated within the system, then it is bound to obey the laws of the system, so as to receive specific inputs from specific sources within the system and for each specific input it must return a specific output to some specific receivers within the system. This is not freedom, and therefore this is not control.

So now the big question is how does free will act within this absolute determinism of the Universe? And the only solution is to introduce another substance into Nature – which we shall call the substance of Action (or in Spinoza’s sense, the substance of “necessity”, on the grounds that Action is *necessary* for life so as to have control and self-regulation). The Necessity for Control implies the Necessity for Freedom.

To summarize our conclusions so far we see that free will is necessary for control and self-regulation, and since free will cannot be the same substance as Spinoza’s universal single substance, then free will must be substantiated by another substance altogether because Spinoza’s single substance cannot adequately describe, account for or include the first person experience of free will. The first person experience of free will is NOT a delusion nor an illusion nor Maya, nor anything else that can be trashed, suppressed, oppressed, discarded, rejected, gotten rid of, brushed under the carpet as an embarrassment...and so on. For if there is necessity as a completely different order from causality as Spinoza himself claims, and if necessity is an aspect of life – such as in the necessity to survive, the necessity to procreate, then life must have the capacity to control its actions in the direction of what it perceives to be necessary. And if life must have control in order to fulfill the requirements of necessity, then life must also have the freedom to exercise this control, and, since Spinoza’s single substance does not offer a place for necessity, we are forced to posit another one to substantiate it.

SECTION TWO

The Substance of Action

So now let us rewind to where we began: “Reality Happens when we look at it”.

Now the “little more complex” part that I promised I would get back to is this. Free will is independent of causality and yet inextricably bound up in it. I mentioned the idea that a body in space is not like a rock in water – the body does not displace space or “occupy” space like the rock displaces the water and occupies a region of it that would otherwise be filled with water. This preserves the essence of Spinoza’s philosophy and at the same time supports Einstein’s space-time continuum (as long as we keep in mind that ‘time’ in physics is time-in-terms-of-motion). But the exception that we are introducing here is that matter DOES NOT interrupt the continua of space and time. To understand this we must understand matter, and to understand matter we must understand the meaning of a discrete entity and how any discrete entity relates to a continuum without upsetting it, without breaking its continuity, without being “in” it as it were.

"The controversy concerning the real and the ideal may also be regarded as the controversy concerning matter"- p19, Arthur Schopenhauer, The World as Will and Idea

If Space and Motion/Mind are the two continua, I distinguish them as two different substances, even though Spinoza’ single substance is an acceptable unification in the sense that these are both continua and are both given as wholes (as entirely or not at all); and because space and time (the latter as pure or absolute motion) always work in conjunction with each other, they may as well be treated as a single continuum; and which we can allow for as a singular entity called “causality”. However, we still need to

preserve the distinction between Space and Time (the latter as absolute Motion) because of a peculiar problem that creeps up in Quantum Mechanics, where it appears as if Position and Momentum need to be treated as if they were altogether independent variables.

"With the Hamiltonian formulation we must select the momenta of the particles rather than the velocities. ... This might seem a small change in itself, but the important thing is that the position and momentum of each particle are to be treated as though they are independent quantities, more or less on an equal footing with one another. Thus one 'pretends', at first, that the momenta of the various particles have nothing to do with the rates of change of their respective position variables, but are just a separate set of variables, so we imagine they 'could' have been quite independent of the position motions" - Roger Penrose in "The Emperor's New Mind"

This gets obviously confusing – especially Penrose’s last words above, of how momenta are to be distinguished between “position motions” and how we “pretend” such or “imagine” that the two parameters “could” have been independent. Position Motion!? What in God’s name is “position motion” and why is it different from momentum-motion or velocity-motion? In Newtonian mechanics we never made any such distinction. When a body moves (our normal common sense mechanics tells us), its motion is a change of the bodies’ position. No doubt the change of position of a moving body is also accompanied with a change of position of its center of mass, but we take that for granted. But it seems that in QM we have to separate the geometric center of position in (Euclidean) Space, with the “Center of Mass” of the body. **Or at least this seems to be the only reason that I can think that can justify or give grounds for such a separation⁷.** Does standard classical mechanics allow us to see that the center of mass as something “apart” from the geometric center of the body? Let us leave aside the cases where a body can be “top heavy” or “bottom heavy”. If we look at every such body as a collection of particles with each having its own center of mass, even then we will find that the overall geometric center WILL always exactly correspond to the overall mass center. So how did the two get separated in QM? (- if that is indeed the case as we have tried to guess above)

I have no doubt whatsoever that Penrose is absolutely correct that this distinction MUST be made and that this distinction HAS been made in the formulation of quantum mechanics (QM) but we can see how confusing it is getting for all of us⁸. With what we have learned so far in this essay, let us see if we can help Penrose out with his expression, because it is mostly a matter of expression, not any lack of reason

So let us take a fresh look at the Position Variable of QM **as position “in space”** and the Momentum Variable of QM **as position “in Motion”**. This simplifies the approach so beautifully. In short, we get two “kinds” of position – the first in Space, the other in Motion. Interestingly, a “position in motion” is a “point motion” - a continuous flux that follows its own determining function in perfect accordance with the “shape⁹” of the Motion Continuum. This makes sense if we look at, say, a circular motion (a circle is

⁷ Remember that “substance” means “standing-under”, that which “gives a basis for”

⁸ The confusion is because Penrose is differentiating position motion from velocity motion or momentum motion. We all common-sensibly know that motion is a change of position (in space). So what is momentum motion or velocity motion other than change of position in space? Does this clarify the confusion that such ideas create in us?

⁹ The reader who is familiar with Einstein’s idea of the “curvature” of space-time, may easily relate to this notion of the “shape” of some motion as analogous to the shape of a body in space.

a continuous function) and, applying the continuum thesis any point on the circular trajectory is also the whole trajectory. The “Motion Position” – which is a point on the circular path, will “evolve” along the circular path in accordance with the equations of QM. But we must not miss out one very important point. We are not to visualize the trajectory of the point motion as having any spatial or geometrical structure – thus, within the Motion continuum, there are no rotations, no spins, no elliptical orbits, no parabolic trajectories. Every one of these “imaginings” of motion are “imaginings” in terms of a body moving in space. The motion of a QM particle (the “Motion Position”) is a pure motion or what we described above as a center of mass. We must retain the essential difference between plain velocities (in Euclidian space) as used in Newtonian Mechanics with Momenta as used in QM, because Momentum is defined as a product of Mass and Velocity. However the definition of momentum as mass x velocity must be abandoned.

So far we have seen how Motion began with being such a simple notion but evolved into such a beautifully complex concept. Not only is motion the equivalent of Mind, it is also the equivalent of Mass. Motion, Mind and Mass are therefore best understood as **consubstantial** – i.e. made from the same basic stuff.

“Next to space and time, mass is the most fundamental notion in physics, especially once it’s so called equivalence with energy had been argued and established by Albert Einstein. Moreover, it has even been argued repeatedly that ‘space-time does not exist without mass-energy’, as a prominent astrophysicist¹⁰ has phrased it” – Preface to “Concepts of Mass in Contemporary Physics and Philosophy” by Max Jammer, ISBN 0-691-01017-X

Though we began this section to look at what we felt necessary – the substance of **Action**, we have not yet spoken about time or energy as yet. Let us do that right away.

Time and Energy are the substance(s) of Action. This is the exact point where my metaphysics takes a clean break, a perfect departure from the standard systems of physics as they are prevailing today. **The point of departure is the distinction between Time and Motion.**

Time, in accordance with my metaphysics, is one of the two substances of Action. Action is always quantized, and as quantized, it provides the “identity” particles of every individual living thing and of every distinct entity that we may perceive. Being quantized allows for the existence of separate individuals, separate perceptions, separate entities, attributes, modes, features, qualities and so on. The world of perception is not illusion but is grounded (substantiated) by Time and Energy.

Now as per the continuum theses of Space and Motion we are prohibited from distinguishing one Spatial-position from another and one Motional-position from another. Thus what we need to “do” now is to “tag” these positions with the substances of Action – i.e. using time and energy **as the required differentiating media** - and “hold” these distinguished positions entirely and absolutely in our PERCEPTIONS¹¹ alone. If we now get back to Einstein’s Space-Time (i.e. Space-Motion) continuum (or

¹⁰ D. Lynden Bell, “Inertia”, Cambridge University Press, 1996

¹¹ Remembering that perception is also an action

Spinoza's single causal substance) and want to have two distinct points (t_1, x_1) and (t_2, x_2) then we express these two points in such a way as to set apart the point from its "tag" so that

$$(t_1, x_1) = (t, x) + (1, 1)$$

And

$$(t_2, x_2) = (t, x) + (2, 2)$$

Here we have ascribed different "substances" (bases) to the continuous and the discrete aspects and placed a vague sort of "+" sign between them to show that they have been superposed upon each other and exist in a sort of mutually complementary way. Please note that the only "change" between the two points are the "ekstatic" substances or the detachable subscripts 1 and 2, the continuum itself is unaffected by these "tags" that we hold in our perception ALONE.

We all know that the General Relativity (GR) of Einstein is irreconcilable with Quantum Mechanics. And we are now in a position to answer WHY these two "kinds" of physics are mutually irreconcilable. This is because Einstein's Relativity is about Continua, whereas QM is about discrete particles. There is a split between *the third person* perspective of the (causal) continuum and *the first person* perspective of DISCRETE Individual Action/Perception.

Spinoza was not unaware of this problem when he spoke about his "single substance". He realized that he also needed what he called "modes" and "attributes", that could help set apart distinctions, features, things, forms, functions and the like. However, while it is one thing to "understand" inwardly and inferentially that "there are" modes and attributes, we must also understand that in making this assumption we are using the same covert or "self-referential" methods by which Spinoza introduced "necessity" as somehow *different* from causality and we have no right to do that if we cannot (literally!) substantiate our claims towards making such *distinctions*.

The key word to remember in the above is our individual right to *distinguish*. Since the unifying continuum prohibits that, then our distinctions must be personal viewpoints only. The personal realm MUST then stand apart in an *ekstatic relationship* with the realm of the continuum.

Time and Energy

Dr. Hitoshi Kitada wrote a very interesting paper in 1994 titled, "The Theory of Local Times". In this paper he sees time as a "*local*" phenomenon and as being the "*activity*" of a "quantum mechanical" local system.

Before we look at some of the interesting features of this paper, let us first be very clear in our minds just where the current physics has failed to present a faithful picture of the world.

The first is its failure to incorporate Absolute Space and Time into physics on the pretext that Absolute Space and Time are unknowable in perception and therefore in measurement *and therefore do not exist*. We have discussed much on this already so let us set it aside for a while

The second major failure is the inability of science, of for that matter, any philosophy, to reconcile continuity with identity. This error is brought to the fore once again by Bertrand Russell in his book, "The Analysis of Matter"

"The evidence for the truth of physics is that perceptions occur as the laws of physics would lead us to expect - e.g. we see an eclipse when the astronomers say there will be an eclipse. But physics never says anything about perceptions; it does not say that we shall see an eclipse, but says something about the sun and the moon. The passage from what physics asserts to the expected perception is left vague and casual; it has none of the mathematical precision belonging to physics itself. We must therefore find an interpretation of physics which gives a due place for perceptions; if not, we have no right to appeal to the empirical evidence.

This problem has two parts: to assimilate the physical world to the world of perceptions, and to assimilate the world of perceptions to the physical world. Physics must be interpreted in a way which tends towards idealism, and perception in a way that tends towards materialism..." - Bertrand Russell (The Analysis of Matter, ISBN 0-415-08297-8)

But we have no intention of doing either. The world of perception and the world of physics, the first person (identity) and the third person (continuity) perspectives have nothing in common that one can assimilate one to another. For if that were indeed possible, we would be reverting to Spinoza's error of a "single substance". Russell redeems himself partially by using the phrase, "tends to", and we shall take this "tendency" as just that; which means that it remain a tendency and no more, and never actually reach its destination or limit.

How easy it would have been if we could just have this one "single substance" once and for all and create a whole universe out of it. But when we impulsively tried to do that, in our hurry and haste to get to our coveted "Theory of Everything", we created the confusion between quantum particles and classical particles, by unjustly demanding that "position motions" and momentum-motions" be treated as "independent variables" in QM while in GR we unjustly demanded that Space and Motion (time) be integrated into a single manifold. But of course physicists will take exception to the word "unjustly". I do not mean that such bold excursions on their part did not produce results, for they did. We did, indeed figure out some things in GR and figure out some things in QM. We did indeed put these figures to good effect in the practical world of technology. Yet, at the end of it all, we failed to remain consistent. Physics is split wide open between the fields of QM and GR. Is it simply a matter of scale? Is all this confusion simply because QM particles are "very small" and cosmological distances are "very large"? Or is there a sharp break between the two, filled only by a very strange emptiness, a very eerie silence, in which our questions seem always to fall on deaf ears?

Let us not dwell too much and too long on these mysteries and move onward to what Dr. Hitoshi Kitada says in his "Theory of Local Times"

Summary. — *A model of a stationary universe is proposed. In this framework, time is defined as a local and quantum-mechanical notion in the sense that it is defined for each local and quantum-mechanical system consisting of finite number of particles.*

The total universe consisting of infinite number of particles has no time associated. It is a stationary bound state of the total Hamiltonian of infinite degrees of freedom. The quantum mechanics and the theory of general relativity are consistently united in this context if one uses this notion of local and quantum-mechanical time. As one of the consequences, the Einstein-Podolsky-Rosen paradox is resolved. The Hubble red-shift is explained as a consequence of general relativity which is consistent with quantum mechanics. This does not require us to argue on the beginning nor the end of the universe. The universe just exists without time.

PACS 03.65.Bz - Foundations, theory of measurement, miscellaneous theories.

1. – Introduction.

As stated in the abstract, the main theme of the paper is to present one possible consistent unification of quantum mechanics and general relativity. This is stated intentionally with anticipating the naive refutation that the Euclidean geometry which quantum mechanics follows and the non-flat Riemannian geometry which relativity follows can never be united consistently.

Our trick of the consistent unification of these two theories is to adopt a ten-dimensional vector bundle $X \times R6$ (the reason $R6$ is adopted instead of $R4$ will be touched below) as the total physics space, where the base space X and the fibre $R6$ are mutually orthogonal.

Quantum mechanics is set on the Euclidean space $R6$ and relativity theory on the curved Riemannian space X . Each point $(t, x) \in X$ is correlated to the centre of mass of the local system consisting of finite number of (quantum-mechanical) particles, and these centres of mass are considered as the classical particles. These classical particles are regarded as moving following general relativity in the Riemannian manifold X on the one hand, and the particles inside the local systems are regarded as moving following quantum mechanics on the other hand. - Hitoshi Kitada - (published in Il Nuovo Cimento – Vol. 109 B, N. 3 – March 1994 – pp. 281-302)

I have underlined the portions of the above extract that are important for our understanding.

By distinguishing the time of the local system from the time of the universe, Dr. Hitoshi Kitada has made a major contribution in the right direction. Secondly, as in the short extract above, Dr. Kitada has preserved the irreconcilability between Identity and Continuity by positing what he calls an “orthogonal” relationship between the QM local system and the Continuum of GR. They are not directly “mixed” up or confused into each other but related as a sort of cross product between two mutually independent sets of physical variables

The third and probably the most important contribution (in my opinion) is that he “substantiates” the relationship between the QM local system and the Continuum of GR by stating, ***in no uncertain terms***, that the “center of mass” of a local system is correlated with a point (t,x) in the Space-Time Continuum (also known as the Riemannian Manifold due to the representation of the three “dimensions” of space and the one “dimension” of time as a complex 4-dimensional geometrical system developed by the German mathematician Bernhard Riemann). Although Hitoshi does not quite state this explicitly, I would like to introduce the notion that ***the trajectory of the local system***, its evolution, ***is the trace of its center of mass*** in the Space-Time (Space-Motion) manifold. This is an idea derived from our ***Motion-Mass consubstantiality paradigm***.

Let us see the parts where his theory succeeds and the parts where it becomes equivocal or even dubious. I would like to quickly add here that by being constrained to describe the world of physics using the three dimensions of Mass, Length and Time as the accepted “standard system”, Dr. Kitada, or for that matter, any new theorist cannot be faulted for making the same mistakes that the current physics is making. Yet, I greatly appreciate Dr. Kitada for his effort to make a point in the right direction despite these constraints. (In a personal remark, Dr. Kitada did once float the idea that the “current physics may have to be abandoned”)

Hitoshi’s theory, in distinguishing between the “motions” of QM particles and the “motions” of classical particles [*“These classical particles are regarded as moving following general relativity in the Riemannian manifold X on the one hand, and the particles inside the local systems are regarded as moving following quantum mechanics on the other hand”*] has made a subtle and unexpected “reference”, namely that of “outside” and “inside”. As a step forward, as an idea that encourages and inspires further inquiry, we can say that this distinction between the motions of QM particles and Classical particles is certainly progressive. But I would not call this either a failure or a success. An important distinction HAS been made, that encourages the idea of “kinds of motion” but more importantly, by introducing, **for the first time**, the notions of “inside” and “outside”, Hitoshi also encourages the idea of first person and third person perspectives. This is the part I find as being something truly successful.

Nevertheless, whenever we make such statements we must also be able to substantiate our claims that such distinctions do indeed exist. In fact this lack of substantiation for the separation of inside and outside also finds its way into the notion of “local” and universal. How can something be local and also a part of the universal without justification? We can quickly see here the same kind of smudge-over between “local” and “universal” as we saw in Spinoza’s “single substance” where necessity and causality got mysteriously unified. Again, with Dr. Kitada, a covert (self-understood) distinction has been made between local and universal or, to get even closer to our first person-third person relationship, between “inside” and “outside”; and yet, it appears, the “outside” is just the “inside” extended to infinity: *“A model of a stationary universe is proposed. In this framework, time is defined as a local and quantum-mechanical notion in the sense that it is defined for each local and quantum-mechanical system consisting of finite number of particles. The total universe consisting of infinite number of particles has no time associated. It is a stationary bound state of the total Hamiltonian of infinite degrees of freedom”*.

Hitoshi does indeed return to the core problem of first person vs. third person when he describes the local system elsewhere *“as if the inside world of the mind”*. But it appears that, in Dr. Kitada’s view, somewhere in the transition between finite and infinite, somewhere in between local and universal, the inside and outside became unified, the first person got swallowed up into the third person.

“Science cannot solve the ultimate mystery of nature. And that is because, in the last analysis, we ourselves are a part of the mystery that we are trying to solve.” - Max Planck

So what do we do now?

The Transcendental "I"

Since we have tied ourselves up in a knot and failed to find any new sensible paradigm, we might as well make one last effort before we think of giving up.

So what we do now is to float the "I". Make it transcendental. No mind, no motion, no mass, no space, no time no energy; just nothing, absolute nothing. Actually I sometimes think I am playing out my own agenda when I talk about the transcendental "I". It is one of my most favorite ideas, and I have lobbied and argued for and debated on this for many years. And naturally so, for who does not want to believe that life is above and beyond mere matter, that it is beyond (the material) life and death on earth. But if that were indeed the case, one wonders why matter is at all necessary. Why must we go through this life on earth with its trials and tribulations only to realize that we were never going to really die, anyway? What is the sense of this futile and cruel exercise called "existence"?

Schopenhauer's pessimism comes to mind.

"Men are only apparently drawn from in front; in reality they are pushed from behind". The Will, says Schopenhauer, "is the strong blind man who carries on his shoulders the lame man who can see". We do not find a thing because we have found reasons for it, we find reasons for it because we want it; we even elaborate philosophies and theologies to cloak our desires. Hence Schopenhauer calls man the "metaphysical animal": other animals desire without metaphysics. – from Will Durant's "The Story of Philosophy"

The pessimism of Schopenhauer is the realization that the Will is greater than the intellect, greater than our power to understand, control or manipulate it. But why is Schopenhauer called a "pessimist" when Spinoza's world is even more deterministic than his? This is about free will isn't it? This is about the tragedy of being "pushed from behind", about not being in control and so on, isn't it?

Perhaps Schopenhauer's pessimism is a two-fold problem. Unlike Spinoza, Schopenhauer had a two-world view. One was the World of Idea – where we were at least free, even if "Ideas" were "mere" ideas bound up in the absolute solipsism¹² of Berkeley¹³. The second was the World of Will, where resides everything that was "not idea" or out of the grasp of our perceptual faculties. Since the Will is not in our perception, it is not in our control either. Aha! So maybe we have found the reason for Schopenhauer's pessimism.

Schopenhauer's "I" was confined to the World of Idea. And "confined" is the right word because he was a thorough Berkeleyan when dealing with perceptions. Imprisoned in the utter solitude of solipsism on one side and overwhelmed by the brute determinism of the universal and all-pervasive Will on the other side, why shouldn't we all become pessimists? It is only natural, no? The world of idea is the world of the individual. It is the collection of his perceptions and opinions, but since they are entirely his own, they are true only to himself and to himself alone. Schopenhauer allowed for an "I", but only under the condition that it be strictly locked up for all eternity. Sounds a lot like how religions deal with the concept of the Devil or Satan or Evil. What a wonderful logical trap is this thing called solipsism, where any attempt to express any opinion about anything can be safely imprisoned for all eternity as "mere

¹² "Solipsism is an epistemological or ontological position that knowledge of anything outside one's own specific mind is unjustified. The external world and other minds cannot be known and might not exist. In the history of philosophy, solipsism has served as a skeptical hypothesis" - <http://en.wikipedia.org/wiki/Solipsism>

¹³ http://en.wikipedia.org/wiki/George_Berkeley

idea". It is no wonder then that religions throughout the ages have found an ideal solution and "cure" for blasphemy and free thinking of any kind.

Perhaps mankind has always been intuitively aware of the trap of solipsism, and in so believing had no option but to cling on faithfully to the common grounds of some universal faith – something that was "given" as absolute, as free of our mundane and trivial human opinions and ideas. Perhaps this need in us is deeper and more desperate than we can imagine, for in the way that religions have fought bitterly with one another over their coveted absolutism, there can be only one answer – that solitude is the greatest of all human fears and so we must belong to some common manifold of faith, no matter if this faith is just faith and much of it (in utter honesty) does not really make all that much sense to us. Or perhaps that is the key idea of a faith – that it must include all those things that are humanly and even scientifically impossible, the more of these the better. Even the most intelligent and inquisitive and scientifically educated minds get weak-kneed when it comes to questioning the faith they were brought up in as children. Faith in general, in its nameless and chaotic form is a vital human instinct – or rather that it is the essence of everything instinctual and primitive and deep about us, and we are not even going to **try** to get rid of it.

So let us settle down and accept this duality for what it is. Schopenhauer, needless to say, recognized this duality, so let us see if it is the same as the Cartesian Duality – i.e. the famous and notorious mind-body split of Rene Descartes. To be quite honest I have not the faintest idea what the fuss about duality is all about, but I will join the fray just for the fun of it.

The act of will and the movement of the body are not two different things objectively known, which the bond of causality unites; they do not stand in relation of cause and effect; they are one and the same, but they are given in entirely different ways. – immediately, and again in perception...The action of the body is nothing but the act of the will objectified. This is true of every movement of the body; ... the whole body is nothing but objectified will....The parts of the body must therefore completely correspond to the principal desires through which the will manifests itself; they must be the visible expression of these desires. Teeth, throat and bowels are objectified hunger; the organs of generation are objectified sexual desire.... The whole nervous system constitutes the antennae of the will, which it stretches within and without.As the human body generally corresponds to the human will generally, so the individual bodily structure corresponds to the individually modified will, the character of the individual. – Arthur Schopenhauer - (as quoted in Will Durant's "The Story of Philosophy")

At first it appears as though the voluntary movement of the body is tied up with the (involuntary?) act of the Will. We must get one thing clear about Schopenhauer which is that his Will is not confined to any isolated individual. It is a universal thing – so much so that he finds it even in the dust and mud of the earth. "The will is the only permanent and unchangeable element in the mind; ... it is the will which," through continuity of purpose, "gives unity to consciousness and holds together all its ideas and thoughts, accompanying them like a continuous harmony" - (as quoted in Will Durant's "The Story of Philosophy"). The will is to be found everywhere in nature, equally and uniformly and we are bound up in it, dissolved infinitesimally into it so that we cannot but be it. The Will must be involuntary if we have no control over it, if it "pushes us from behind". It must be involuntary if we are going to get overpowered by it and become perfect pessimists like Schopenhauer. And yet he speaks of an "act of will" and then again of "an act of THE will" – where "act" implies some sort of agency. There seems to be a bit of trouble in the expression – if indeed Will Durant has been faithful in his quotations of Schopenhauer. Or perhaps Schopenhauer was undecided whether we should look at "Will" in a general and universal sense or as "the will" – as being specific to an individual. However at the end, he disposes

all doubts and says that the Will can occur in an “individually” modified form – a form that best expresses the “character of the individual”.

In that case, Schopenhauer’s Will is the same as Descartes’ Mind and it also corresponds to our individual world of experience, where we have said earlier that our consciousness appears to be extended over a very limited region of space (body) and over a very limited region of motion (mind). But the difference between Schopenhauer and Descartes is that Schopenhauer denies any causal relationship between the two.

Academic philosophy has beaten around this bush for decades without getting anywhere and I am one who likes to see the action – so let’s get to it right away

In our explorations of the paradoxes and dualities so far we have seen that there is one duality between identity and continuity that is “irreconcilable” and which, we said, always remains in an ekstatic relationship, where Space and motion (mind) are the continuities (the stuff of general relativity) and time, energy are the identities (the stuff of quantum mechanics) and which are always in an ekstatic relation to each other. In Schopenhauer, when he says that “the act of will and the movement of the body are not two different things objectively known”, it means that, in his words, they are “given immediately”. Period.

Being “given immediately” means that both the will (as mind/motion) and the body (as spatial extension) are continua. Action, voluntary action, the sense of “doer-ship” – which constitutes our sense of identity, is not available when it comes to continuity. We feel we are different, separate, active only in the identity aspect. “Given immediately” in regard to continua means that we do not have a sense of doer-ship or “agency”, and hence we mistakenly call this “unconsciousness” but it is “unconscious” not in the sense of being out of our control, but being out of our sphere of sensible experience. This is not to say that the continua are not experientiable¹⁴ – for they are, but that this experience DOES NOT translate to sensory or sensible forms as such that could be expressed in symbols or language.

So what Schopenhauer is really saying is this: that the will (mind/motion) as one continuum and the body (space) as another continuum are unified – there is no causal relationship between the two. Schopenhauer is therefore not a mind-body dualist like Descartes. Rather, the unification of will and body is the unification of Motion-Space and which is the “single substance” of Spinoza and which is the space–time manifold of Einstein

Schopenhauer follows this up with “then again in perception”. Perception is the sense of “I did it” but it is a sense that stands apart from mind and space, it is ekstatic to mind and space, ekstatic to will and body. He seems to be indicating, albeit subtly that these two seem to be worlds apart – which is what our ekstatic relationship is all about. I hope this is clear so far. To summarize, Schopenhauer is NOT implying a mind-body split, he is implying, like us, a continuity-identity split. We can see how this is further verified – when he says that the body is a complete “Topological Map” of the Will. Topological mapping can be done only between continua, which is why Einstein’s space-time unification is an acceptable idea and which is why Spinoza’s single substance is an acceptable idea. There can be NO topological mapping between continuity and identity and this relationship will always be ekstatic.

¹⁴ It would be interesting to note that religious experience or the deeper and inchoate emotional experiences stem from the continua (find substance in the continua)

What then is Descartes talking about (with so much conviction)? He is looking at things differently, not wrongly. He is talking about the subject-object duality. We could define his subject as the bound state of Mind-Energy and his object as the bound state of Space-Time (where "time" in the latter case is intended as the particulate or quantized time – not the time-in-terms-of-motion as is commonly used in physics)

We can see after all this just how much CHAOS has been created in philosophy and physics by not understanding the difference between time-in-terms-of-motion and true time.

Anyway, now let us get back to the transcendental "I". When Schopenhauer says that the "act" of will and the movement of the body are not causally separable, he is unifying the two continuities of Motion (mind/will) and space. Perception stands apart from both space and motion/mind/will. But what is important for us is that BOTH are unified under a singular "act". The one aspect of the "act" is "given immediately, inwardly, naturally, the other aspect of the "act" is given in perception, sensibly, individually, personally. The "act" is the same – but given in two different ways. And this "act" I propose is the act of the transcendental "I"

It is important to remember that the "act" is always singular, so what we are getting at is that there is a singularity called "I", and by being transcendental it is not any substance at all, it is not mind, will, space, motion, mass, time or energy, but it stands apart from all these as a transcendental point of control. This is the basis for the "Law of Self-Regulation" that I mentioned previously. I am not at all surprised that Schopenhauer was so pessimistic about having any control over the will, because for the most part, the will operates in us like an "auto-pilot", and we are creatures of habit who will go to any length to remain within what is warm and familiar, tested and true. We do not change our wills as much as we change our perceptions, but there are times in our life, the times of crisis when we are forced to change our thinking radically, to call upon a completely new paradigm.

Let me end this Essay with a story from the Geeta that I have often quoted and which perfectly summarizes the essence of what we are talking about here.

"On the battlefield, the warrior prince Arjuna is plagued with moral doubt and indecision. The God Krishna is his counsellor. As his mind wanders along with numerous questions, the discussion alights upon the meaning and nature of physical existence. Krishna explains by an example: "The five horses that pull your chariot are like the five senses, the chariot itself is the body" Being an intelligent man, Arjuna is quick to answer, "Ah! So I am the driver of the chariot?" Krishna smiles and says, "No, the driver of the chariot is the Mind, you are the one who sits behind the driver"

Let no-one get the wrong idea that the driver is a slave that can be ordered about at every whim and fancy of the owner of the vehicle. He has his own rules, and he is a very good driver, for he obeys the rules of matter – the laws of physics most perfectly – or rather that he IS the embodiment of these laws. One does not change the laws of the world, one simply finds the best avenue of action that the driver can permit. But sometime we do not know these rules. And that is the time when we have to ask the driver, politely and kindly¹⁵, if there is still a way to get where we want to go without breaking any of his rules. If we are rude and tell him to get the hell on with it, we will be corrupting ourselves and the way we see the world, for the mind, the will, the single substance, causality, the laws of physics, the word of

¹⁵ By introspection or thought

God – call it what you may, just cannot be corrupted. But if we are patient, and think deeply, there is always a way, there is always some new paradigm that we discover and feel ecstatic about for a while, only to realise that this paradigm is as old as creation itself. Suddenly things become so obviously clear to us, that we wonder why we or anybody else did not think about this before.

This is a sort of paradoxical experience that Schopenhauer describes below:

“Everyone believes himself a priori to be perfectly free, even in his individual action, and thinks that at any moment he can commence another manner of life, which just means that he can become another person. But a posteriori, through experience, he finds to his astonishment that he is not free, but subjected to necessity; that in spite of all his resolutions and reflections he does not change his conduct, and that from the beginning of his life to the end of it, he must carry out the very character which he himself condemns, and as it were, play the part which he has undertaken, to the very end” – as quoted by Will Durant in “The Story of Philosophy”

With every new paradigm of the mind, we think we have discovered a new freedom, only to realise that the mind was always what it is. To understand this we must understand mind as an infinite freedom of possibilities, by which even though this freedom is unlimited, it is also absolutely lawful. Only that freedom is good which is an absolutely lawful freedom, and the laws of the mind, the laws of God are infinite. If we must seek freedom, we do not seek it away from God, because God IS the freedom that we seek.

Summary

What we have done in this essay is to offer a “substance” approach as a solution to all the various paradoxes in physics and philosophy. Like Nietzsche, we “philosophise with a hammer” in that we demand that everything be “substantiated”, that all ideas and all experiences whether in perception or in emotion have some basis, that they be grounded in some reality or the other.

We then identified the bases, the hard grounds, the justifications as four “substances” namely, Space, Motion, Time and Energy

I realise that I have not gone too deep into the substances of Time and Energy – for these are the quantum mechanical “elements” and will require a separate chapter or two to establish with any convincing clarity.

We also posited the transcendental “I”, albeit briefly, as a Nothingness that stands in contrast to the something-ness of substance, but someone may ask, what is the substance of nothingness? It is a good question that can be answered in two ways. One, the weaker answer, would be to posit nothingness as a negation of substance – in the manner of a “nihilation”. This is a weak answer because nihilism has acquired a very bad reputation and Sartre’s Being and Nothingness remains gathering dust on my bookshelf since 1987. The good answer to this question – in the spirit of Nietzsche’s “hammer” is that Nothingness is none other than Life itself.

Life, then becomes our “fifth” substance, but we hold on to the “nothingness” interpretation as far as the working of our system requires it to be.

Conclusions

1. The split between General Relativity and Quantum Mechanics is accounted for
2. The split between Free will and Determinism is accounted for
3. The Mind-Body duality of Descartes is resolved

4. The Will-Idea duality of Schopenhauer is resolved
5. Schopenhauer's pessimism is restated as the true picture of life using a transcendental "I" to refresh his pessimism into the greatest possible optimism
6. Science and Religion need never be in conflict after this (through an understanding of self versus non-self, as ownership of agency versus conforming with divine law)