

Between Math & the Real world How the 20th Century went astray!

Noel Eberz Hawaii Island, January 2015

Being well aware of the admonition about how to drink from the Pierian Spring, I discovered there are too many varied versions of it and found conflict between the virtues of being a generalist and the narrowness of the pure expert, particularly if financial gain was not a necessity. My literary mentors, like Eric Hoffer, Karl Popper or Ilya Prigogine, exposed how much of the world & universe there is and to try to be somewhat attuned to it all.

Amusingly and recently a notable quantum physicist declared the universe was essentially just mathematics. Maybe even Richard Feynman, one I was always positive about, is tagged to have said to his questioning students “Shut up and calculate.” I certainly don’t question the power of mathematics but mellowed on the philosophy of Karl Popper that it is we who extract out of this strange domain and as noted here, a good deal of it is bizarre and its fantasy extremes a hazard to our youth.

Losing faith in that sacred scientific altar and other gods, I had to come up with some organizing principles. This became my bizarre division of the Universe, the Abstract and the Mind/ourselves as a unique fallout. Trying to describe it in a concise statement brought into question many things and the consideration of a few of them put forth in this essay. So, to be as clear as possible and being willing to defend my choice of every word, this interpretation has evolved.

An Interpretation (circa 1975)

My overall interpretation considers an irreducible triad: The Universe, the Abstract, and the Mind (ourselves). The first two are totally independent of each other but are amalgamated into the existence of the third, which can reveal and reflect on the nature and relationships of the three.

The Universe exists and hums essentially in dimensions not readily perceived. First-order organizations and interactions are on minute scales with a rapid beat. Consequently, larger organizations and durations of the Universe that are perceived become more the domain of the Abstract by the Mind, rather than some absolute physical reality. Organized concepts of time, space and substance are just that - concepts.

The Abstract is a strange infinite domain, in that it exists outside of time, space or substance hence outside the Universe. And while it exists without Mind, the order and nature of its constructs are only created by arbitrary limits and rules selected and imposed by the Mind. It could be god-like in some obscure way as in ‘nature’s god’ but not very well revealed. With regard to the Universe and the Abstract, two major aspects are apparent: First, the Abstract has no relationship with the Universe beyond that perceived by the Mind, and second, that relationship is always imperfect with various degrees of truth content (verisimilitude).

Awareness (consciousness) in the Mind involves a blended perception of the Universe and the use of the Abstract. Survival of the Mind (and body) is directly related to this relationship and the physical reality (truth content) of these perceptions. This is different than the direct link to the Universe for the continuity of other life forms without consciousness. Awareness of truth content itself is an advanced state of the Mind and different in kind, in that it is a special aggressive aggrandizement of this triad and a fulfillment of a true eschatology, such as the following determination:

The Abstract is: without form, time or space. The Universe 'possibly exploded' into existence and a becoming order, including blossoming of the Mind. The Mind has shaped the Abstract to comprehend the whole with ever-greater appreciation (humanity) and truth content (knowledge and wisdom).

This is only an individual thought and possibly only a momentary glimmer in a minor place. The history of the development of the Mind has been tumultuous and slow but suggests a progressive trend and greater humanity in rare cases. Yet the burden of the rapid growth of depressed masses of mankind and heartless runaway technocracies may yet smother the bloom. I hope not. I respect my heritage and community and pledge my life and sacred honor to the preservation and nurture of this triad.

Basis of this triad

Is this triad a necessity or a convenience? In my mind it is a necessity. Most notoriously, Copernicus had to describe his heliocentric theory of the planets as a mathematical convenience when considering the full political impact of his ideas on others, particularly those who could do him harm. He was not allowed to disturb the prevalent image in the consensual mind's eye of how the solar system worked. So this here should not startle the world either. Still, why divide the universe into three parts when the typical definition of the universe is 'the whole' or may be considered as such? That's reasonable, and if this triad serves no other purpose for you than to provide an equivalent mathematical construct by which to clarify thinking, then OK. But if it helps to create a new paradigm with more comprehension and yields greater explanatory power, it should be so considered.

The relationship of time with the mind or the self is another bizarre aspect of our physical reality in the universe. Scientifically, some concepts of time remain a paradoxical question in many erudite minds, particularly its one-way direction and only 'now' nature. We properly tend to assume our ride on this flow as part of ourselves so it is difficult to imagine where we fit outside this physical aspect of the universe. With apologies to Omar and Fitzgerald, we may question:

And that inverted bowl we call the sky,
whether it moves as impotently as you or I.
We may look at it and just wonder why,
it passes on while we must die.

The universe does its own thing and as we imagine now, for billions of years without our direct observation and quite independent of our existence, whether we like it or not. These notions have surfaced over a long cognitive development and certainly embellished with the Greeks, the Reformation, the Enlightenment and modern science. But within this history there are significant misunderstandings and limitations, not with the universe but 'us', particularly with math and language.

So in summary, we have come a long way from the time when our distant ancestors possibly peered out from the safety of a cave, momentarily comfortable, not afraid and reflective on a sparkling, quiet evening sky¹. What constitutes human awakening? Is it just happenstance that this view permits us to look out and back on awesome amounts of expended time, space and substance in motion and the opportunity to appreciate it? We might explore some of these ideas further with the triad paradigm as we look into the many perspectives and mind sets that have evolved with mankind (Eberz, 2013).

¹ For a very different reading, '*Nightfall*' (Asimov, 1990) creates a startling image of the effects of a less serene midnight view.

Mass & Energy

As a topic Mass & Energy can't be separated. In the early century, Albert Einstein presented his famous $E=mc^2$ equation describing the conservation and equivalence of mass & energy including all its profound meanings. But I think one of the most important has been neglected. We must first go back even to the previous century.

I have noted before, the irony of John Priestley's concern for phlogiston, a form of heat release in combustion. This old idea was diminished to obscurity and ridicule with Antoine Lavoisier's recognition of the simple conversion of some elements into other compounds and balancing their new weights arithmetically. Essentially the difference was roughly recognizing the conservation of atomic mass in the later and not recognizing phlogiston as the trivial mass/energy conversion to heat² in the same phenomena as we do now. Continuing, I have previously stated the amount of energy in mass is staggering, and even read recently that a packet of sugar theoretically contained enough nuclear energy as an explosive to level New York City. I agree that a hypothetical destruction of NYC is a staggering thought, but there is a more practical way to demonstrate how much energy there is in mass by relating to more trivial exchanges as in phlogiston. We can consider the issue a number of ways. Some authors have noted that the greatest problem in general physics is the incompatibility of Relativity and Quantum mechanics.

James Clerk Maxwell informed Albert Einstein that the permittivity & permeability of space defined the velocity of light (Voc) and when Rudolf Carnap questioned him on the significance of 'now', Einstein informed him that was only a human observation not appropriate in formal physics. But paraphrasing Carnap "Isn't physiology based on physics?" (Schilpp, 1963).

Concerning the above, the reference of the 'void or vacuum of space' to the velocity of light is not as relevant but rather should also be established as a function of the intensity of the gravitational field. Consequently expressing $E/m=c^2$ with 'c' a variable based on the intensity of gravitational field yields much more subtle energy/mass conversions. And I perceive that time is not an independent dimension but a dependant variable within space & its contents, a stress/strain, with the physical 'stress' potentially yielding consecutive changes, hence the illusion of flowing time. The physical changes to 'now' drive and suggest the illusion of flowing time as a dependent variable, as in life, not the other way around. Compared to an implied infinite number copies of the Universe in four dimensions, 'now' constitutes only one in three dimensions with the past the integral past changes and the future only the anticipation of future changes. That challenges the concept of space-time.

At the other extreme in Relativity, spaghettification is a nonsense word, I'll coin the word Roche'ed³. As in spaghetti, organic chemical organization would be rendered to carbon, hydrogen, etc. endothermically sundering chemical bonds. Further considering the interior of a Black hole, Relativity prematurely dies at the Schwarzschild radius, yet the fantasy math to the mass singularity (no more definitive than the letter 'm') is oblivious of the mass/energy trends of high density internal physics as in a neutron star which should be even more environmentally hellacious in a Black hole.

As the basis of the FQXi Foundation's motivation, I do caution that young physicists, astrophysicists and cosmologists become aware of some of these ideas and not 'shut-up' but 'think softly' until they too can freely express their thoughts without peer condemnation.

² It's not trivial if your trying to warm yourself around a campfire let alone worse, if your house is burning down.

³ The Roche limit in a gravitational field can exceed the binding strength of any mass object.

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