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Jeremy Horne

International Institute of Informatics and Systemics

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A FRAMEWORK FOR STUDYING CONSCIOUSNESS

Jeremy Horne

mindsurgeon@hotmail.com

THE PROBLEM OF "CONSCIOUSNESS"

INTRODUCTION

Let's sit down together and converse a bit somewhat informally about "consciousness", setting aside the rigidity and formality of academic discourse, although paying scrupulous attention to our accounting for how we arrive at our thinking. Yet, we need to humble ourselves when discoursing about puffing up in "peer-reviewed" academic settings. Please allow me to set forth the problem and possible ways of resolving it. Then, by correspondence, I'd like to learn your thinking on the matter.

So, the formatting and style guardians can take a break on this one. Too, the language is horrible enough to obsess about minutiae obscuring overall content. (Yes, I use my own punctuation style, in keeping with logic, rather than custom.) Then, I hope my failing vision (not the least of which is my monovision, pseudoholes, and -35° parallax) has not allowed too many errors to creep in. All this said, I have been heavily involved in peer-review activities [Horne, 2018] and appreciate the concern for knowledge quality and communication issues. Now, on to the substance.

If we knew what consciousness is, rather than merely talking about it, there would not be so many papers, books, and conferences still asking, "What is consciousness?". We do not ask, for example, "What is gold?", "What makes up a water molecule?", "What shape is the Earth?", or much of anything "physical," at least at the macroscopic level. Physicists say they seem to understand so, although I think many deep down inside they know they are lying to themselves. There seems to be more ambiguity in mentally-oriented words than physical ones. However, as we will see, all these words - "physical", "mental", "experience", and, especially, "consciousness", among others, deserve quotes, because we really do not know what we are talking about when using them, at least in the prevailing ways. However, with this understanding, I will omit the distracting punctuation, save for directly-referenced words (meta-linguistic use).

I set forth a means from a philosophically logical standpoint that hopefully will assist scholars in arranging their presentations on consciousness in a philosophical framework. Much of the following may at first appear obvious, but if it were, I do not think there would be the perseveration over its essence and how we experience it. There is a vast canyon between knowing and internalizing, awareness but not living that awareness. Perhaps drumbeats - like those sounded in this document - are necessary to result in the latter. Again, all these words are loaded, and if we do not have that philosophical framework, we will wander forever without direction or order. For example, even saying that we understand much but not all of our world without qualification is not only broad-based but rather arrogant. Then, saying we do not know (__ fill in this blank)__ is too vague. It is important for one in the field to set forth their philosophy, assumptions, and limitations, and, yes, their unavoidable biases - just as a logician or mathematician would - in the beginning to provide a complete package of their argument. What is "know", and what do we mean by it? Just saying that we do or know something (ontology) is aimless without that framework. More difficult is establishing the criteria for assessing when we do think we know, i.e., epistemology. I think you will realize the accuracy of my remarks as you progress through this document.

Here, I take what appears to be known to academicians, and, frankly, may be tutorial, and arrange it within my framework to illustrate a new perspective. Even though I may not solve any of those deep problems here, I sincerely hope that the following will be interesting reading. I do not even pretend to have given an adequate discussion of all that is relevant. For example, I have left out Giulio Tononi's [2016] integrated information theory of consciousness and my old acquaintance

from Tuscon Christof Koch of the Allen Institute of Brain Science, as well as so many others. Neither have I covered adequately important sidebar views like "notion" and "concept", which I would say Hegel in "the ground" has described in his *Logic* the essence of singularity. As a logician, I have failed to include how intuitionist, various modal, and paraconsistent logics relate to my ontology (supported by the epistemology). Indeed, this article easily can be expanded to a book, and if I live long enough, such will emerge.

THE CONTEXT

We live in a web - worldwide (W.W.W.), language (semantic web), physical (the world of things and their processes), and mental (ideas, memory, etc.). Each element is embedded in a contextual field. In this paper, I will call attention to a node but return to it with another way of looking at it. Hence, mine is not just a repetition of an idea but it viewed from a different direction in the web.

Our very being - consciousness included - has a becoming, a context, etymology case in point. Misunderstanding can start with a word, especially in a semantic web. The present embodies the past. Too, everything is dependent upon what it is not for its existence. Everything is integrated, amply described by chaos theory [Gleick, 1987]. A *Portland (Maine) Press Herald* reporter at our Kennebunk High School assembly in 1963 told us how seemingly insignificant events could have a knock-on effect of major wars and other disasters (e.g., WW I), another version of "For the want of a nail, the shoe was lost", and ultimately the country. One of my colleagues said that describing the context of one's presentations makes them more complete. Hegel in *Philosophy of History* writes of everything having a becoming. Ignore that, and you will not know what anything is. What in one's background gave rise to her/his ideas? While academicians may attempt to depersonalize their work, second-order cybernetics [Horne, 2021] recognizes the seeming inability of an observer to escape her/himself. The observer becomes part of the observed. I'll return to this shortly in another context.

Studying consciousness includes mentation - ideas, emotions, intelligence (John Gardner's "multiple intelligences" included [Gardner, 1993]), thought, ideas, psyche, and any other non-tangible essence typically attributed to the brain and supporting nervous system and even its supporting biological systems. We also have a "philosophy of mind", imploring us to develop ways of thinking about it, a meta-thinking. For now, never mind Russell's "set of all sets" problem! Equally perplexing are awareness, sentience, and experience. How is it that we claim to know that which we cannot physically discern? More crassly put, if you completely lose consciousness (as in the Rio Rancho Glasgow coma scales), you die. Along with mentation goes the physical ... and vice-versa. Now, I go to my context.

A recurring nightmare intruded on my early life. It began with my being enveloped in a soft black environment. Slowly, I became aware of a barely perceptible unfocused movement evolving into a focal point culminating in a red dot. This dot vibrated, becoming larger, vibrating even more violently until it subsumed the blackness with an explosion. At that point, I often woke up crying or screaming, my mother running frantically into the room. I have reflected upon this dream quite often and wondered if it isn't connected with an obsession I have with this consciousness project, a project, incidentally, resulting from a lifetime of thinking about our whole universe. I seriously doubt I have been the only one experiencing the dream, and those who have perhaps will better be able to mentally experience the following.

At the outset, I have been deeply interested in philosophy, especially idealism. In many respects, I have sympathized with Platonism, for many personal reasons, not all satisfied with the physical, although painfully aware of its existence. Or, does that domain exist? Then, how do I know? Is there any problem at all with the idea of physical? Why was the dream's focal point bothering me?

Besides some ancient views of Plato and others, we have primarily Rene Descartes (1637/1912) to thank (or curse) for our modern ability to miniaturize information, the reductionism so loathed by philosophers enchanted by phenomenology. To understand anything, we need "...to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution. (Ibid., p. 15)... by showing we cannot conceive body unless as divisible"[Ibid., p. 76]. I used to say to my logic students, "carry forth this process until ...". We reach sub-Planck space, "the smallest of the smallest", where particles flick in and out of existence (cf. Casimir Effect, "virtual particles").

Jean Piaget, a child psychologist, caught my attention with:

There exist outline structures which are precursors of logical structures, ... It is not inconceivable that a general theory of structures will...be worked out, which will permit the comparative analysis of structures characterizing the outline structures to the logical structures characteristic of the higher stages of development. The use of the logical calculus in the description of neural networks on the one hand, and in cybernetic models on the other, shows that such a programme is not out of the question. (emphasis included). [Piaget 1958, p. 48].

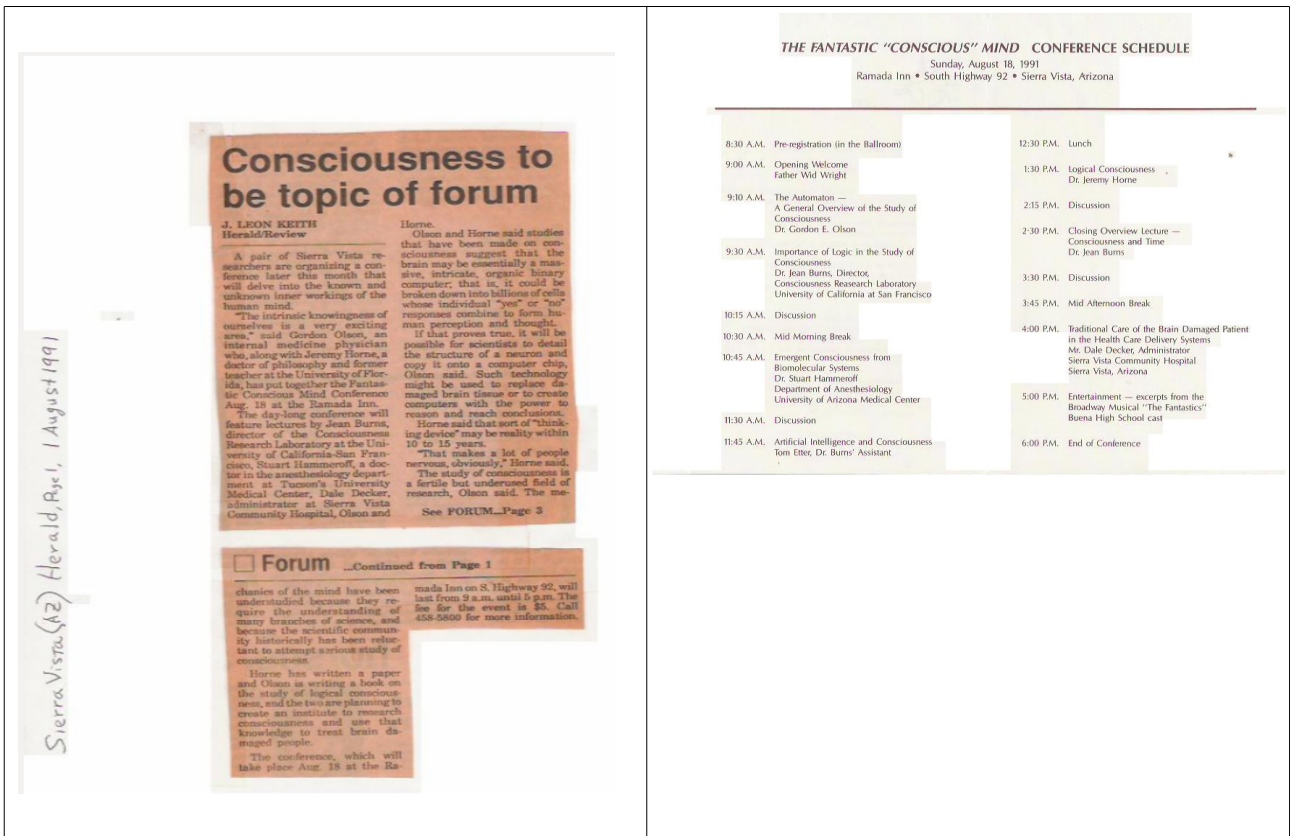
Physicist John Archibald Wheeler reinforced Piaget by saying physicists also write of the arrangement of the universe according to a "pregeometry as the calculus of propositions" such that "...a machinery for the combination of yes-no or true-false elements does not have to be invented. It already exists" [Misner, Thorne, and Wheeler, 1973, p. 1208 et seq.].

How do I exit the echo chamber but reach out to others obsessed with consciousness and the possibility that we live in a binary-based universe?

While teaching logic during the latter 1980s in Tucson, Arizona, and researching binary structures [Horne, 1997], I came into the consciousness field through Stuart Hameroff's [2022] papers on orchestrated reduction (OR), fascinated with the apparent binary character of microtubules. I requested and received from him a set of photocopied articles (which I still have) explaining the OR idea. Could 0/1 expressions be those of "something" attempting to communicate to us about the nature of the world in which we are living?

Dr. William Wheeler, a colleague of mine at Science Applications International (SAIC), knowing my interest in consciousness studies and philosophy of mind, suggested I see Gordon Olson, MD, a Sierra Vista internist, also interested in the subject. After driving far out from the city to his house on a very country road one dark night, he told me about his daughter, Maria, who "... one frightful day in February 1981 ... [was] suddenly thrown into a coma [Olson, circa 1994]". In her "persistent vegetative state", she died in 1988. During that time, Olson was obsessed with the thought she was "always there". She had to be "conscious", because, at one point, Olson said to Maria something like, "It is OK; you can leave if you want", whereupon she died. I suggested the formation of a consciousness conference, and he shouted, "that's a great idea!" He and I discussed Hameroff's work on microtubules as at least one of the bases for consciousness. Olson said he knew and would contact Stu, and I would talk to Wheeler and others. I do not recall the mechanical details, but the planning was done and the agenda set.

On 18 August 1991, the *Towards a Science of Consciousness* conference series was born. Known then as "The Fantastic Conscious Mind Conference", the original auspicious assemblage at the Sierra Vista, Ramada Inn Ballroom that day had great hopes there would be future conferences to bring together the world's experts in consciousness to answer Olson's question. Olson, true to his dictum "Think Positive" (reflected on his fliers advertising this "pre-conference") had his dreams at least partially fulfilled.



First TSC conference (provided by Horne)

From its inception, TSC has been beset by pseudoscience and the fringe and "woo woo" element, David Chalmers, neural science and philosophy professor at New York University, an original organizer but later withdrawing as a co-organizer, allegedly saying, "It got far enough out there that I no longer felt comfortable with it being my product." [Bartlett, 2018] and joining with other academicians to form the Association for the Scientific Study of Consciousness. Yet, such has not prevented famous peer-reviewed academics presenting their work, not the least of whom have been Nobel Laureates Roger Penrose and Brian Josephson, originator of Josephson junction fame.

WHAT IS THE PROBLEM?

THE HISTORICAL CONTEXT OF MIND-BODY

Even a cup of coffee can affect mood, a fact not lost on Emil Wilhelm Georg Magnus Kraepelin (15 February 1856 – 7 October 1926), a German psychiatrist explaining the biological and genetic foundation of human behavior in his 1883 *Compendium der Psychiatrie: Zum Gebrauche für Studierende und Aerzte (Compendium of Psychiatry: For the Use of Students and Physicians)*. How could one ignore the likes of Phineas P. Gage (1823–1860), a U.S. railroad construction foreman suffering but surviving a large gunpowder tamping iron rammed through his head, obliterating a large section of his brain's left frontal lobe? Gage's resulting personality changes surely caused notice, especially by doctors interested in psychology. Yet, gross anatomy is only the patina of whom we are.

As the world became increasingly complex and contentious (think of wars and their technology - Crimea, 1853, the U.S. Civil War, and, of course, World War I), scholars and decision-makers increasingly realized the importance of intelligence, Alfred Binet (8 July 1857 – 18 October 1911) leading the charge with his Binet–Simon test. And, what of the psychological condition of social leaders, themselves? U.S. WW I soldiers took the Army General Classification Test (AGCT). Through the years and ongoing is the realization that these I.Q. tests may only be achievement tests

and reveal only a limited aspect of a broader intelligence or mental capability, John Gardner's *Multiple Intelligences* exemplifying the depth of sophistication. The mid-1950s saw greater attention paid to pharmaceutical responses to behavioral problems, chlorpromazine, and lithium drugs of choice.

What of a person not adapting successfully to her/his social milieu? After all, does not one want a stable society? For decades, human mentation problems were met by behavioral therapy (Think B.F. Skinner.), formal cataloging appearing in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) and the *International Classification of Diseases - 10* (ICD). The DSM, in particular, classifies human mental disorders based on The *Minnesota Multiphasic Personality Inventory* (MMPI), a series of questions answered by a person suspected of having mental health issues. The whole behavioral assessment is flawed by a) it being a subjective (by the subject - self-reports) evaluation and b) the evaluation, itself, being a single snapshot (as opposed to a series of evaluations over an extended period of time, my term being "dynamic evaluation").

The American Psychological Association says the person is a candidate for having a mental disorder, that is:

... any condition characterized by cognitive and emotional disturbances, abnormal behaviors, impaired functioning, or any combination of these. Such disorders cannot be accounted for solely by environmental circumstances and may involve physiological, genetic, chemical, social, and other factors. Specific classifications of mental disorders are elaborated in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (see DSM-IV-TR; DSM-5) and the World Health Organization's *International Classification of Diseases*. Also called mental illness; psychiatric disorder; psychiatric illness; psychological disorder [American Psychological Association, 2022].

Then, what of persons having non-conventional ideas in any field, especially philosophy? Does their not getting along with their peers designate their social dysfunctionality? I ask this in the context of oppressive political regimes incarcerating opponents in mental institutions or other confinement facilities. There also is the complexity of social/cultural norms. Much as I appreciate scientific methods, having been past president of the American Association for the Advancement of Science Southwest (U.S.) division, I sometimes chafe at those "rationalists" and radical skeptics freely tossing about terms like "pseudoscience" and quickly dismissive of anomalous phenomena. I appreciate the controversy over "scientism". From biological insults of a tamping iron removing part of the brain to one having unpopular ideas, we refer to "consciousness", "mind", and mentation in general., but our standard methodologies and thinking frameworks do not appear adequate for investigation. Even our language does not seem sufficient to communicate our findings. I find myself saying constantly, "I hate that word, but I cannot think of any other."

ENTER THE RESEARCHERS

It seems that there is a problem of identifying the nature of consciousness, inasmuch as the TSC was born and has continued since as The Science of Consciousness (TSC) conferences. Other conferences have emerged (as a quick glance at <https://conferenceindex.org/conferences/consciousness> will confirm), represented by the International Conference on Artificial General Intelligence and Consciousness, and the Society for Consciousness Studies annual conferences, along with possibly thousands of publications on the subject.

During the 1980s, along with greater psychiatric (including pharmacological) intervention in the treatment of mental disorders (as opposed to mere behavioralism), increasing attention was turned to the physical basis of mentation, i.e., the brain, echoing Kraepelin. Thus, through a joint resolution passed by the United States Congress on 8 March 1989, the "Decade of the Brain" was born. Out of this grew efforts to explore the neural basis of mentation, as in the National Institute

of mental Health (NIMH) [Research Domain Criteria](#) (RDOC). NIMH includes genetics, opening the door to all physiological correlates. That is,

RDoC is a research framework for new ways of studying mental disorders. It integrates many levels of information (from genomics to self-report) to better understand basic dimensions of functioning underlying the full range of human behavior from normal to abnormal. ... RDoC is not meant to serve as a diagnostic guide, nor is it intended to replace current diagnostic systems. [The goal is to understand the nature of mental health and illness in terms of varying degrees of dysfunctions in general psychological/biological systems.](#)

Overall, "*The Brain Research Through Advancing Innovative Neurotechnologies*® (BRAIN) Initiative is aimed at revolutionizing our understanding of the human brain [Brain Initiative, 2022]".

Numerous projects are afoot to develop an artificial brain. Search for:

- Riken Center for Brain Science [2022]
- IBM -Systems of Neuromorphic Adaptive Plastic Scalable Electronics [SyNAPSE, 2022]. ;
- Human Brain Project [2022].

I am pretty sure I have omitted dozens, if not hundreds, of others. Worthy of note is the bifurcation of natural and artificial intelligence, intelligence not inclusive of all mentation (e.g., emotion). Somewhat of a sidebar question is mentation contained in a non-hydrocarbon construct. Bear in mind, also, our bias to human mentation, realizing mentation (even awareness) residing in non-human life, i.e., animal consciousness. The broader issue of animism gets attention below.

THE NUB OF THE PROBLEM

Tied to the consciousness problem is identifying the object of consciousness, perhaps Piaget's and Wheeler's "outline structures"/"pregeometry", my logic courses (following academic standards) always incorporating "calculus of propositions". However, I see the binary logic as the language of innate order in the Universe, both the physical and mental each half existing (explained below).

As I have with the dream, I suspect others personally wrestle with mind-body duality. Wrestling can be hard. Indeed, David Chalmers, Professor of Philosophy and Neural Science at New York University, refers to consciousness as the "hard problem" (especially properties, "qualia", and phenomenal experiences), which I say may not be so hard if we parse the discussion appropriately and account for other factors. I am not saying the overall problem of consciousness is easy, only we can create our own difficulties by using go-nowhere approaches.

Tinfoil hats persons aside and academicians rolling their eyes, a legitimate response is in order, especially addressing Chalmers' concerns, i.e.,

- No position on the mind–body problem is plausible.
- Materialism: implausible. Dualism: implausible. Idealism: implausible. Neutral monism: implausible. None of the above: implausible. [Chalmers, 2017, p. 28]

If no position is plausible, does the question even make any sense to ask what consciousness is, posit a way to solve the problem, or give an explanation? Everyone talks about consciousness as if it does exist.

Then, what about this from the *Essentia* website:

For over forty years now, we've known from repeatedly refined and confirmed laboratory experiments that the physical properties of the basic building blocks of the material world—think of the mass, charge, spin, speed and direction of movement of elementary particles—do *not* exist prior to being measured [2-19]. [Kastrup, 2022]

Essentia represents the view that "...materialism is false ... metaphysical materialism is fundamentally flawed". I struggle to accept what appears to me as a layperson to be a "Copenhagen interpretation" of reality, that we create it. Of course, we need to know what "material" is before refuting it, and I contend the barriers to this are just as high as those facing us attempting to jump into the world of the "mental". It is a grand step to deny existence, not the least object of which would be ourselves, thus returning us to Descartes. Aside, a bit, the fundamental narcissism

residing in all of us justifiably makes Nick Bostrom's proposition that we may be a simulation [Bostrom, 2003] exceedingly uncomfortable. More down to earth, what prompts measurement in the first place, our focus on something to be measured, implying it already existing? Alas, ontology (object) stands as one pillar of our existence, the other being the process - how we know (justified belief), epistemology.

So, what does exist, and how do we know? Given the above, Chalmers thinks physical and mental are not useful constructs. Around 1996, Chalmers [1996, *passim*] wrestled with neutral monism [Stubenberg, 2018], a view more in keeping with mine, discussed below. Overall, his assertion that consciousness is a hard problem hardly can be denied, if we use the wrong lens to look for a solution. Even if we do not seem to know what consciousness is, we cannot be know-it-alls, either.

JUMPING THE METAPHYSICAL BARRIER

THE BOUNDARY

I see no better way of illustrating the seeming inability to arrive at ultimate explanations, the metaphysics, than presenting a deceptively simple problem of measurement. For example, is a line six or seven meters long? Isn't it obvious by inspecting the meter stick? Yet, the end in this case falls directly on the measurement line. Carrying out Descartes' method ad infinitum - to Planck scale, we never can locate the end and are forced to establish the limit, just as in the calculus. Ultimately, the determination is subjective, not only because of bias but each individual standpoint, or perspective is unique in spacetime, the question being whether there can be a consensus on what the exact measurement is. Our metaphysical barrier is literal. Other metaphysical conundrums are the nature of the singularity (with the associated wave-particle duality problems), creation, causality, and, yes, consciousness. Use the mnemonic, "S+3C".

SELVES

Apparent boundaries exist for sentient beings, those with mentation, and I surely include animals, possibly single-celled, but surely mammals and avians. I apply "mentation" only to "living" beings, recognizing the major problem of discerning what "life" is. For the "non-living" and to avoid the controversy over animism, I refer to "static field", described below.

We need a solution set framework, the most basic ontology and epistemology. Above all, as Clint Eastwood said in *Dirty Harry*, we also need to know our limitations and why. I answer this first, because it shapes my responses to the previous. Because we keep looping back to the foundations of knowledge - how we know that we know, and what we know is how we know, etc., we should be aware of the metaphysical problem of locating a certain stable platform. For example, I have difficulty with Chalmers' "intrinsic properties", "causal", and "physical", in that we should be sure of what these are before talking about them. If there were no metaphysical issues, there would be no disagreements about ultimate anything - reality, our origin, purpose, and so forth. Academicians seeking tenure and publications would go defunct. Everyone would be in a state of bliss, but I think the Eastern philosophers may have a monopoly on this.

We see ourselves through ourselves, both individually and collectively, as the subspecies *Homo sapiens sapiens*. Escaping John Horgan's "solipsism problem" does not appear likely [Horgan, 2020]. Otherwise expressed, we cannot get outside ourselves to see ourselves, this requiring a dual consciousness somehow merging to produce the "absolute" one. The closest exercise I can think of is that of gazing into a mirror [Deleniv, 2018; Preston et al., 2015], where one often experiences existence outside her/himself. Even if a god or other "absolute" appeared, we'd still have the same problem of our getting in the way of ourselves (cf: second-order cybernetics [Horne, The philosophy of cybernetics, 2021]). Now, comes Second Order Cybernetics, recognizing the experimenter also becomes part of the experiment. Sidebar observations are the

Copenhagen interpretation and Heisenberg, although - as mentioned above - it would be presumptuous to argue that we create reality. It appears that there may be a reality but that it is multi-faceted, each facet being an individual seeing it.

DIMENSION

We live in a fishbowl. Useful is Edwin Abbott's 1884 satirical novelette *Flatland*, describing two-dimensional persons unable to explain a raindrop (or other object) descending from above. Perhaps Jolij's view of consciousness as a dimension falls into the same category.



Figure 6: Cover of *Flatland* - first edition

We are stuck in a similar situation, apprehending phenomena, seemingly unable to explain the underpinnings (at present). For example, our acceptance often depends upon testability (Popper - *The Logic of Scientific Discovery*), but some situations do not seem to be amenable to it, as in cosmic inflation, string theory, parallel universes, and dimensionality, itself.

THE SOLUTION

Of course, we cannot drift aimlessness in a sea of unknowing. One aspect of our world is a beginning and end. While it is not the only way to be, at least our mentation can operate within this dimension.

I think we can mitigate these problems by provisional acceptance (as opposed to faith), the same basis on which we seem to function on a day-to-day basis. Otherwise, we will remain perpetually frustrated by the anxiety of never being satisfied by certainty. Mathematicians and logicians use such bootstrapping with their definitions, rules, axioms, and other assumptions in creating (or perhaps discovering) their systems. In the same way as not obsessing about our apparent inability to resolve metaphysical problems, a diver does not stand on the edge of the swimming pool platform wondering if a volcano erupted on some distant planet. A logician does not ask for certainty in positing axioms, premises, and definitions. Neither does a scientific experimenter allow uncertainty about a hoped-for outcome prevent hypothesis testing. In many

situations, especially in science, the result is failure [Barwich, 2019]. In most cases, these people go forward.

Logicians and mathematicians begin with assumptions - axioms, postulates, definitions, rules, and so forth, in other words, bootstraps. From their work emerges a system, a collection of interacting entities having inputs and outputs, along with a set of rules. The abstraction, or system construct - often based on observation - is instantiated with more specific elements, or classes, that is, a model. Finally, these "containers" are filled with specific items. The modeler then simulates the instantiated model to discover the outcome of interactions, procedures standardized, exemplified (though, perhaps not idealized) by the *Modeling and Simulation Body of Knowledge* (MSBOK). Such modeling and simulation aims to test concepts. Think of ones with explanatory value, like those of Ptolemy and Newton. Scientific revolutions are like this, explained more eloquently than I, as in Thomas: Kuhn's *The Structure of Scientific Revolutions*. This is what is needed in the field of consciousness studies. I am presenting only a logical framework for the process, not the model, itself.

More specifically, my currently-described framework proposes to establish consistency in explaining unknown phenomena. That is, it would allow us to explore with explanation how something could occur. It might explain my dream. It would account for malevolent and constructive mentation and, although I disdain to provide these emotive appellations. For example, does evil exist? However, explanation does not imply existence. If we are stuck with solipsism, so be it. Perhaps a consensus of solipsisms can arise. Let's accept for now the Cartesian thing - ourselves and subdivision - and proceed. What generates my framework?

WHAT EXISTS - THE REALITY

THE MOST FUNDAMENTAL LAW

There is the phenomenal aspect to apprehension - things as they appear, and the "mechanics". Just as I know what falling is, I also know what uniformity and difference are. Whether these metaphysically exist, again, is that Abbot problem and to us seemingly irresolvable. My bootstrap ontology may not be satisfying, but I do not think that Heisenberg did anyone seeking certainty in the world any favors, either.

Physical laws emanate from extended repetition and repeatability of processes. Be it the fabled apple falling on Newton's head or Galileo observing over and again objects dropping from the top of the Leaning Tower of Pisa with the same acceleration, a general principle emerges, a law.

Walking into a room without lights presents to us objects that cannot be seen because of the uniformity of the darkness. If all the objects are of uniform color and in the same shade of light, distinguishing them is nigh impossible ... at least insofar as vision is concerned. Yet, walking up to one of those objects and touching it will reveal its difference from others, merely by the texture and physical edge. At this point, we realize that apprehension has at least two aspects - visual and tactile. The other three senses of objects may present themselves as smell, sound, and taste. In these ways, we come to know the objects empirically. Applying this to many situations - like trying to see in unlighted rooms, touching large telescope mirrors, plugging the ears, or walking into a clean room, I know respectively that I cannot see objects, detect any protuberances, hear anything, or smell any odors or scents. One has knowledge through the senses or experience. Mentation operates in the same way, Eastern philosophers working on meditation, removing all the clutter of thoughts.

From these, I present the most fundamental law:

You cannot apprehend anything except in terms of what it is not. That which exists exists because of what it is not.

Stubenberg captures the essence of my view:

... the mentality and physicality are features of complex structures of neutral entities. But the entities themselves are free of mental or physical aspects/sides/properties. Therein consists their neutrality.

Much will turn on how the details of the *Both View* are articulated. It must not, for example, be understood as proposing the identification of mental and physical properties. For the dual-aspect theory insists that the two aspects are fundamental and irreducible to each other.

Both as well as on the *Neither View*, is understood in terms of mental and physical properties. [Stubenberg, 2018]

That is, I try avoiding the bias of imposing on the elements the term "physical" or "mental". It is not necessary to do. Such does not imply denying reality or our creating it.

Barring that, meditate. East Asian thinking (Hinduism, Taoism, Buddhism, etc.) centers on escaping this world of *maya*, or illusion, our so deeply meditating that we become at one with the universe. As a note, "illusion" does not refer to our world about us not existing, but - at least to me - the physical part, at least in its most reduced form - sub-Planck space - permeated or always being in a constant state of flux. By the time you perceive anything ("perceptual lag"), it has changed. Phenomenologically, everything you sense or experience – even intellectual experience as abstractions – requires difference. Such is our ontology, the study of purported existents.

Look at these words denoting common ideas:

set	element
teoria	praxis
singularity	heat death
chaos (physics)	entropy
potential	actual
infinite	infinitesimal
science	technology
episteme	techne
synthesis	analysis
motion	stasis
alive	dead
abstract	concrete
education	training
order	randomness (inability to predict). anarchy
build	destroy
environment	system
edge	center
general	specific
induction	deduction
wave	particle
superposition	collapse
wisdom	data

interdisciplinary	discipline
complex	simple
potential	kinetic
autopoiesis (self-organization)	autodestruction

The lefthand is more encompassing or amorphous, from which the right-hand column emerges. It contains, includes, or produces the right. For statisticians, the right is a sample, the left the whole population. The right is an instantiation of the left, the left is induced or synthesized from the right, and the right is deduced from the left.

Here are some more, but the left does not really contain the right.

honesty	corruption
emotion	reason
property (characteristic)	individual
space	time
ideal	real
mental	physical
anti-particle	particle
left/heavy/up/yes ,etc.	Right/light/down/no, etc.

In both tables, you need each for the other to exist!

I suspect an excellent taxonomy of difference types would elucidate our inquiry. Immediately relevant to us are:

- mind - body
- mental - physical
- abstract - concrete
- logical - empirical
- ethereal - material
- timelessness - time
- zero - number
- stasis - movement

... all heuristics in a typical discourse on consciousness but ordered in a special way to reflect the most fundamental law.

Many will think the unity of difference is the unity of opposites (e.g. positive-negative, yes-no, left-right, is-is not, being-nothingness, etc.), but looking closely, you will see opposites a subset of difference. For example, black does not imply white, only another color. Left differs from right, both an opposite and a difference. Distinguishing by any of our senses perforce follows this most fundamental law. Abstractions depend upon sensory data; accordingly, the law applies in this domain, too.

We can give a basic idea a fancy name like "neutral monism", where the academics can twist and turn in a semantic web, still never coming to a resting point, because that web is endless, just like the Universe, curved in on itself. Nevertheless, it is intellectually healthy just to take a conceptual journey starting with a recognition of our limitations and finding out historically who has traveled a similar route. It turns out we have some fine company. History absolves the voices on behalf of the most fundamental law.

Samkhya (also spelled “Sankhya”) philosophy, with basic ideas 3500 years old, says consciousness is embodied in Purua (person) and is bonded to prakṛti (matter), each existing because of the other.. From this fusion comes *buddhi* ("intellect") and *ahaṅkāra* (ego consciousness). Samkhya is a way of looking at the world that is non-religious, thus allowing no clutter of gods and theistic mythologies (Ruzsa, 2018; Samkhya, 2018).

The familiar Chinese Yin-Yang is another source, the unity of opposites being expressed in Lao Tse's 6th century B.C.E. *Tao Te Ching*, from which the following is taken. Very similar to modern cosmologists' description of the singularity is “Tao looks like a void. Yet, It is omnipotent! It is in the Depths. It is the Origin of everything” (p. 6).

From Ta Te Ching [Antonov, 2007]:

- “When people know beauty, they also understand what is ugly. When people learn what is good, they also realize what is evil. In this way, existence and non-existence, hard and easy, long and short, high and low allow knowing each other” [Ibid., #2, p. 5].
- “They come out from Tao manifesting Their Individualities, then come back to the state without individual manifestations in It.” [ibid., #14, p. 10].
- “The interaction of opposites is the sphere of Tao’s activity” [Ibid., #40, p. 22].

Many will recognize this "unity of opposites" as a mainstream Eastern idea, but do not forget the Milesian as philosophers like Heraclitus [McGill and Parry, 1948, pp. 418-444].of the sixth century B.C.E., and up to the present with dialectic philosophers. The "is" - "is not" ostensibly oppose each other, but when applied to anything, they become the unity of difference, a singularity. "Opposite" is a special case (subset) of difference. Whether the resulting singularity is neutral depends upon perspective. For example, colors are not opposites but differences.

Heraclitus observed [Patrick, G.T.W., 1880]:

The unlike is joined together, and from differences results the most beautiful harmony and all things take place by strife.

Into the same river you cannot step twice <and still other> waters are flowing [XLI].

For men to have whatever they wish would not be well. Sickness makes health pleasant and good hunger, satiety, weariness rest [Ibid., CIV, p. 109].

The harmony of the world is a harmony of oppositions[Ibid., LVI, p. 98]

...both are and are not [Ibid., LXXXI, p. 104]

For human nature does not possess understanding [understanding resulting from how contradictions operate to present anything to us for that understanding], but the divine does [Ibid., XCVI, p. 107].

God is day and night, winter and summer, war and peace, plenty and want [Ibid., XXXVI, p. 93]

Opposite change is permanence. Parmenides (c. 544-450 BCE) said:

One path only is left for us to speak of, namely, that it is. In it are very many tokens that what is, is uncreated and indestructible, alone, complete, immovable and without end. Nor was it ever, nor will it be; for now it is, all at once, a continuous one. For what kind of origin for it. will you look for? In what way and from what source could it have drawn its increase? I shall not let thee say nor think that it came from what is not; for it can neither be thought nor uttered that what is not is. And, if it came from nothing, what need could have made it arise later rather than sooner? Therefore must it either be altogether or be not at all. Nor will the force of truth suffer aught to arise besides itself from that which in any way is. Wherefore, Justice does not loose her fetters and let anything come into being or pass away, but holds it fast. ... And there is not, and never shall be, any time other, than that which is present, since fate has chained it so as to be whole and immovable.

[Parmenides (544 - 450 BCE), 1951]

Parmenides, himself does not allow change at all, including his thinking. Heraclitus saves himself from advocating only change existing by “The harmony of the world is a harmony of oppositions ...[Ibid., LVI, p. 98] and “...both are and are not “ [Ibid., LXXXI, p. 104]

Plato in the *Theatetus* refers to the dualistic philosophers saying with respect to "give the name of 'being' to both of them together? ... 'the answer is plainly that the two will still be resolved into one.' " Further still The Sophist [1755] a stranger refers to "reciprocation of opposites", that is, contradictory.

Aristotle [1984] said, “Everything, therefore, that comes to be by a natural process is either a contrary “ contrary, the privation”, [Ibid., 191a13-191a21, p. 453/15] “or a product of contraries.” [Aristotle, Physics, 188b21-188b26, p. 449/10]. He says it is not the former, concluding, “...our principles must be contraries.” [Ibid., 188b36-189a9, p. 450/11].

Binary nature of things: “it is impossible that there should be more than one primary contrariety” [Ibid., 189b19-189b27, p. 450/11]. “...Clearly then also to come to be so-and-so from what is not means ‘what is not’.” [Ibid., 191a35-191b9, p. 454/16]. "...a thing comes to be from the privation, which in its own nature is something which is not—this not surviving as a constituent of the result." [Ibid., 191b13-191b17, p. 454/16]

Aristotle said, “Whether the form or what underlies is the substance is not yet clear.” [Ibid., 191a13-191a21, p. 453/15].

Pairs of opposites which fall under the category of relation are explained by reference of the one to the other, the reference being indicated by the preposition "of" or by some other preposition. Thus, 'double' is a relative term, for that which is double is explained as the 'double of something'" Ibid., Categories 10 – 11b22-33; 192a25-192a34, p. 455/18)[Note the Bekker references.]). Such is “...the underlying nature to substance, i.e. the ‘this’ or existent”. [Ibid., 191a9-191a12, p. 453/15].

Come modern times. Cosmological research suggests of the unity of difference, i.e., the Universe after the big bang is the CPT [(charge, parity, and time symmetry)] image of the Universe before it, both classically and quantum mechanically. The pre- and postbang epochs comprise a universe-antiuniverse pair, emerging from nothing directly into a hot, radiation-dominated era [Boyle et al, 2018].

I see words like:

The spacetime is (C)PT symmetric in the sense that the tetrad geometry according to an observer who moves forward along the $\xi = \text{const}$ thread is identical to the tetrad geometry according to an observer who moves backward along the thread and reverses the spatial one forms $e_i \rightarrow -e_i$ This is precisely the boundary condition responsible for producing the famous oscillations seen in the CMB power spectrum, with the correct phases. [Ibid.]

Key phrases are "symmetry between past and future", "contracting half of our Universe" (contrasted to our expanding half - as the antiverse contracts, this one expands in compensation), and "matter-antimatter asymmetry on one side of the bang is the opposite of the asymmetry on the other side" [Ibid.]. I think this article confirms the above discussion on dimension, the first and subsequent ones following the same innate process "emerging from nothing".

Hegel said:

true and positive meaning of the antinomies is this: that every actual thing involves a coexistence of opposed elements. Consequently to know, or, in other words, to comprehend an object is equivalent to being conscious of it as a concrete unity of opposed determinations. The old metaphysic, as we have already seen, when it studied the objects of which it sought a metaphysical knowledge, went to work by applying categories abstractly and to the exclusion of their opposites. [Hegel, 1830]

A dear colleague and friend of mine wrote distinguishing "polar opposites" from "contradiction", recalling Hegel's "antinomies ... coexistence of opposed elements". "Polar opposites" reveals Hegel's essence, a globe coming to mind. The globe needs two poles; they don't

cancel each other but complement, affirm, and, of course, co-exist. My words, "something exists" clarifies my friend's words, because "negation", "nothingness", and "cancellation" deny existence, and "contradiction" mean the same. I point to our dimension and occurrences within it, then to everything not our dimension. Underlining both still is distinction, our dimension and nothingness instantiations of P and not P, just much as two different things in our dimension. Paraconsistent logic seems to follow this path, accommodating contradiction. The schema and apprehension methods are the same for both situations. Duals may be expressed most effectively by a 2500-year-old debate over everything constantly moving or motionless, another way of saying reality versus illusion.

In passing, prior to Einstein's general relativity theory, scientists looked to Newton's view of space stood by itself, absolute, not changing, and eternal, a Heraclitan perspective.

The problem emerging from the unity of difference is how and why the law operates the way it does. What occurs when the differences meet? Why cannot we apprehend each independently? Thank you, Abbott, for your concurrence.

Russell:

The basic constituents of the world of Russellian monism are the fundamental entities of physics (not the insubstantial events of Russell's world). But the most fundamental properties of these fundamental entities are not their physical properties, but the intrinsic properties in virtue of which they have those physical properties. And these same intrinsic properties do, when arranged appropriately, give rise to conscious experience. Therein consists the monism of this view: at the bottom there are fundamental entities with certain intrinsic properties; all else is grounded in this fact. [Alter, 2019]

John Archibald Wheeler

...every 'it'—every particle, every field of force, even the space-time continuum itself—derives its function, its meaning, its very existence entirely—even if in some contexts indirectly—from the apparatus-elicited answers to yes-or-no questions, binary choices, bits. 'It from bit' symbolizes the idea that every item of the physical world has at bottom—a very deep bottom, in most instances—an immaterial source and explanation; that which we call reality arises in the last analysis from the posing of yes-no questions and the registering of equipment-evoked responses; in short, that all things physical are information-theoretic in origin and that this is a participatory universe. [Wheeler, 1990]

If bivalent logic is the language of innate order in the Universe each of the bivalents (usually symbolized by zero and one) cannot exist by itself, given the most fundamental law, their existing simultaneously as the substratum. Here enters the debate over a continuous or discrete universe.

Is the singularity the primal order, more explicitly its bivalency expressing the most fundamental law. Stuart Kauffman is correct in his 1993 *The Origins of Order* about the boundary of chaos being order., because order emerges from this LaGrange area/boundary.

If our universe is discrete, it is composed of singularities, monads. Of course, the discrete needs the continuum in order to exist. What, then, is the opposite of monads but vacuum space or nothingness? Again, we should not be searching for an object necessarily, but at least at the same time, process. I may sound like a jabbering idiot in need of a professional - and I may be, but those who think they know how the most fundamental law "works", what quantum mechanics is, or the nature of the singularity either a lying, arrogant, or need to be wearing those funny pajamas in confined supervised quarters.

Notice that "physical" nor "mental" are not necessary to explain the most fundamental law. We need only movement and stasis, the constituents of our universe and the dimension within which it finds itself. "Physical" and "mental" are heuristics, neither describing our reality.

Why the unity of difference law works as it does can be answered in the same way gravity, the law of attracting bodies, superposition, and all the rest do - just as Abbot answered why his two-dimensional persons failed to know why the raindrop did what it did: dimensional limitation. We

only experience its result. Yet, I suspect number and time are involved, where both are events, stemming from the same process of succession. Time represents the amorphous (continuous), number the specific (discrete), another pair in the unity of difference, one existing because of the other. Where, how, and why the two meet remains the problem.

HOW REALITY APPEARS

THE CHARACTER OF FIELDS AND THEIR ACTIVITY

According to Oxford [Oxford-field, 2022], a field is, "...the region in which a particular condition prevails, especially one in which a force or influence is effective regardless of the presence or absence of a material medium". What occurs or is eventful in a field is described by tensors, sets of vectors, descriptions of a magnitude having direction.

A field is an area, zone, space, or other relative synonym recording the effect or influence of something, our never arriving at its most basic level of what it is. There are electromagnetic, thermal, gravitational, and electromagnetic effects displaying themselves in a field, all reducible to movement as movement, perturbations, or displacement. A similar problem exists with forces, such as the strong and weak.

To this point, we have seen references to "movement", "change", "difference", and seemingly related words, but if we are to make consistent sense of the seen and unseen, the "mental" and "physical", I will want to start with a framework having parameters allowing me to describe occurrences in each, and field makes the most sense, since we do not know what a "particle" really is. Yet, it is the most fundamental law governing both, and that law is predicated upon difference.

What exists in a field? Difference is not synonymous with displacement or movement, the latter an aspect of the former. It is an aspect peculiar to the visible field. I hesitate to apply it to the mental. Does movement occur in the mental? In considering time, itself, it would appear so, as motion depends upon it. Then, what are motion, movement, displacement, and perturbation?

In three Newtonian (at least) dimensions - physical and mental, picture a two-dimensional plane as a slice in a cube, the whole plane moving forward. As we look at the plane, one point is related to another, different or equivalent (not identical) . On that plane, the point is not moving with respect to the other, but it is different, minimally with respect to location (and perhaps otherwise). Yet, in the Newtonian frame, particle motion occurs, displacement occurs "moving forward" in time. In a quantum world, the point may be moving simultaneously in all three directions ("vibrating"), a singularity, if you will. For the followers of the debate about time's existence [McTaggart, 1908] , the plane represents the "block universe", the "forward" movement the dynamic aspect of time. The physical processes just described have an analog in the mental domain.

At first glance, it may appear that difference is in quality, Chalmers' pet word, "qualia", but such is like identifying a work as art or rubbish. It says nothing and is value-laden, at best; it is a perceived effect of something, given a label by our very inadequate language. Remember, part of the metaphysical barrier is getting outside ourselves to see ourselves. A quality to one person may not be to another. It is more interesting to ask if physical laws, like $E=MC^2$, have a counterpart in the mental domain. In the same vein I search for any and all analogs of the physical in the mental.

Now, we come to the types of these domains, or fields. Think of different recording devices or techniques to detect sensory phenomena - sound, light, smell, taste, and touch - the empirical, sensory, or physical. Everything else is mental, but I suggest counterparts here, too. At least as an initial bootstrap, my model now may be applied consistently, to both the mental and physical domains.

WHAT IS "PHYSICAL"?

The word "physical" is a heuristic referring to a condition of our existence we cannot explain, and may not have any intrinsic explanatory value. From the 17th century and 18th century view that there is a fundamental solid collection of particles comprising the Universe through the 19th century view of Priestly, Faraday and Maxwell to the famous $E=MC^2$ [McMullin, 2002], we now arrive at physicists avoiding the Descartes problem of not discerning the smallest of the smallest tangible or measurable by fields, preferring words like, "any physical quantity which takes on different values at different points in space. [Feynman,1970, 1-2]". Physicists like Horst Beyer state, "practically nobody believes in the existence of point particles", but, "physics is unlikely going to move beyond the point particle concept, since all fundamental theories of physics, quantum field theory and the theory of general relativity, are based on this concept and are in perfect agreement with experiment and observation" [Beyer, 2014.]. Note that the experiment, definitions, axioms, methods, and ruleset all exist in this physical domain.

The physical field evidences displacement, perturbation, or movement, colors, temperatures, and other properties measured in a field all aspects of the former. We do not know the nature of that which gives rise to movement, and physicists settle for what "works" [Ibid.]. That perturbing the field may be movement as movement, evidence of something, the "something" at this point beyond our means to identify. The perceived smallest of the smallest called "leptons", "quarks", and "gluons" may be composites of something else, and such is why physicists revert to fields.

The problem of describing consciousness as an electromagnetic field, as does McFadden, is intractable, because we cannot what perturbs the field. This is not to say that such fields evidence an underlying phenomenon (that we still have not identified). McFadden says:

... nearly all examples of so-called 'integrated information', including neuronal information processing and conventional computing, are only temporally integrated in the sense that outputs are correlated with multiple inputs: the information integration is implemented in time, rather than space, and thereby cannot correspond to physically integrated information. I point out that only energy fields are capable of integrating information in space. I describe the conscious electromagnetic information (cemi) field theory which has proposed that consciousness is physically integrated, and causally active, information encoded in the brain's global electromagnetic (EM) field. [McFadden, 2020]

However, Sheldrake's "morphic field" (www.sheldrake.org) may be the analog in the static field, a subject suggested for research.

WHAT IS "MENTAL"?

While physicists appear to navigate in the physical domain, we still are figuratively speaking in the Medieval period in the mental, doing alchemy and discovering by trial and error. "In olden times", doctors spoke of "humors", "miasma", and "consumption", but our diagnostic knowledge and classification schemes - again, through reductionism - have allowed better identification of diseases and better treatments. Mentation, as we have seen, has taken a similar path, but we still are in a quandary about consciousness. At least the physicists have their fields and recognize the limits of "particle". We do similar development for the mental.

"Consciousness", a mental appearance, shares the same column as "stasis" in the table above. Recapitulating a bit, the "physical" is dynamic - movement as movement, because of the Heisenberg uncertainty resulting from the inability to measure position and momentum at the same time. That and Planck-scale particles appearing and disappearing (cf. Casimir Effect, "virtual particles") suggests the absence of these particles occupying a single point in space-time. Obeying the most fundamental law, physical exists because of mental; movement exists because of stasis. Hence, if we are to use fields to evidence activity, there is a physical and mental field. Occurrences in the physical field have their analogs in the mental one.

Consciousness (mental) is in a static field, the physical a dynamic one, each a pole embracing analogously a Lagrange point balancing or connecting the two, a boundary condition providing that neutrality as a singularity, emanating because of the most fundamental law.

Because the physical/dynamic field is variegated, so, too, it is expected the static field would be, as well. Each has conditions or events that create (emerge) or destroy (entropy). Illustrative of this is our universe expanding towards entropy (heat death) but contained within it are creative areas. Autopoiesis (self-organization) exists because of entropy. As there is self-organization, so there is autodestruction. Characterizing a field event or entity as malevolent or beneficial is a value judgement best left to another forum.

How can change occur in a static field? Recapping the above discussion a bit, movement or change occur with time. Our field records movement as movement - the dynamic one -is variegated in many ways, the most basic one as generative (birthing, creative, etc.) ranging to destructive (entropy) but overall our universe's future ending with heat death, or maximum dispersion of movement - stillness, stasis. Applying the most fundamental law to the opposite of dynamic - stasis- displays the static field assuming variegation, as well, correspondingly with its generative and destructive areas, again, value judgment. For example, while many fear death, others welcome it, the latter seeing themselves as part of a constructive process. For those perceiving phenomena (apparitions, ghosts, angels, etc.), my task here is only to present a model for mentation, one requiring much further investigation.

We know what there is in the physical world because of the effects, not by what it actually is. We see the disturbance - movement - in the physical field. Correspondingly, we see the effect in the static one by observing the effects of mentation, Garner's multiple intelligences, mental disorders, and so forth. We do not seem to have located the smallest of the smallest, as in the physical field.

EXPERIENCE

Years ago in graduate school, I wrestled with John Dewey's 1916 *Democracy and Education*, his thesis that education requires both theory and practice, the latter more specifically experience. Required are two ways of knowing of its existence, rationalism (idealism, abstraction, non-material, etc.) and empiricism (knowing through the senses), a physical way of knowing. "Rationalism" and related words take us back to square one, labeled "mentation - what is it?".

Immanuel Kant said,

There can be no doubt that all our knowledge begins with experience. For how should our faculty of knowledge be awakened into action did not objects affecting our senses partly of themselves produce representations, partly arouse the activity of our understanding to compare these representations, and, by combining or separating them, work up the raw material of the sensible impressions into that knowledge of objects which is entitled experience?"

Reason is never in immediate relation to an object, but only to the understanding; and it is only through the understanding that it has its own [specific] empirical employment. It does not, therefore, create concepts (of objects) but only orders them, and gives them that unity which they can have only if they be employed in their widest possible application, that is, with a view to obtaining totality in the various series. The understanding does not concern itself with this totality [of reason], but only with that connection through which, in accordance with concepts, such a series of conditions come into being. Reason has, therefore, as its sole object, the understanding and its effective application. Just as the understanding unifies the manifold in the object by means of concepts, so reason unifies the manifold of concepts by means of ideas, positing a certain collective unity as the goal of the activities of the understanding. [Kant, 1787/1929, B1: and B 671-672: (emphasis added)]

Front and center, how is it we know a person has had a specific experience, aside from the person having others? Piaget observed, "Experience relies on data, or events [Piaget, 1953–Origins, p. 360]".

The mind then proceeds from pure phenomenalism whose presentations remain halfway between the body and the external environment, to active experimentation which alone penetrates inside things. What does this mean if not that the child does not undergo simple external pressure from the environment but tries, on the contrary, to adapt himself to it? Experience, accordingly, is not reception but progressive action and construction: This is the fundamental fact.

[Ibid., p. 365]

"Concrete reality is the ensemble of the mutual relationships of the environment and the organism, that is to say, the system of interactions which unify them." [Piaget, Ibid., p. 376]

How does all this occur? From a biological standpoint,

... representations of space, time, and number are systematically interrelated at the start of postnatal life, before acquisition of language and cultural metaphors, and before extensive experience with the natural correlations between these dimensions. [de Hevia et al., 2014]

So here is how empiricism works for us. In the outside world, for example, I look at a small animal, like a mouse. I remember its size. I then see an elephant, comparing it to what I remember about the small animal, the mouse. At the same time, I can, from memory, represent it by sketching a mouse and ascertaining exact size by placing one mouse to the next until the elephant is filled. As each mouse is added, I ascribe a symbol, enabling me to remember the object or process (and this starts giving meaning to the word "number"). If I stop partway, noting the object or process, I can compare it to what the elephant requires.

Numbers emerge this way. (an empirically feasible approach to the epistemology of arithmetic). Piaget demonstrated that both logic and numbers have a physical and correspondingly abstract foundation [Piaget, *Fondation*, 2022], and scientists have discovered neurocorrelates responsible for the human ability to quantify, as noted above.

This all may be fine for the physical domain, but I see such a discussion fixates us in an endless loop, the hurdle being how to address mentation. To process the physical sensation seems to require cognizance. Hence, I suspend any use of the word "experience", pending a viable framework within which it can fit. Yet, I do like Creighton's [1903] words:

The direct view of experience, it is said, shows us subject and object together in fundamental or organic unity [p. 608]. ...Functions, as we have already maintained, imply a central unity which is something more than the mere togetherness of parts. Or, to put the same thing in a different form, the fact of functional relationship implies the existence of an inner pervading identity running through the parts. In experience this principle of identity comes to consciousness of itself by distinguishing itself from the objects in which its nature is expressed and embodied. [p. 610].

While his meta-view of experience and consciousness are from the idealist perspective, it does seem somewhat analogous to that Grand Unified Theory physicists are seeking in the material world.

THE SUBSTRATUM AND REALITY

Particles are discrete, the opposite continuous, and we are left not knowing if the Universe is either. At this point, I suspect physicists might call my layperson's view of the Universe being both at the same time flippant. In a corollary fashion, applying the most fundamental law, we see that neither the physical nor that which it is not (mental) has independent existence, thus both simultaneous from where - like our singularity - one of those "Abbot problems" of dimensionality arose, again, metaphysical. Be reminded that everything we are and our situation - physical, mental, and whatever else - coterminously emerged from the singularity. That is, everything carries

with it that which was imminent in the singularity, including the most fundamental law. The singularity was an embodiment of that law, and everything emerging from the singularity obeys that law.

In any dichotomy, neither by itself can exist but only both at the same time in the same space. Otherwise, we have "half an ontology" (here being the first time I ever have used the term). Democritus, Leibniz, and Chalmers are correct about "monads", but in this way. More important, note that the left side in our above chart appeals more to the idealist, the right the realist, the former in the head and not tangible (inherently empirical), the right bumping into our senses.

If we have "half an ontology", then what really does exist in my model, aside from the law? What does the law yield? Aristotle was looking for the substratum, that which underpins everything. Recollect from above, Aristotle's, "Pairs of opposites ... are explained by reference of the one to the other ...".

Such is "... the underlying nature to substance, i.e. the 'this' or existent". [Aristotle, op. cit., 191a9-191a12, p. 453/15].

Hegel said, "But we can say, too, that it has been the conviction of every age that what is substantial [substratum] is only reached through the reworking of the immediate by our thinking about it." [Hegel, 1830/2001, §22, p.54]. At the core of experience is how we see ourselves and our environment through ourselves.

However, if we consider seriously Hegel's view that everything contains its own contradiction as prescient to modern views of the singularity, we can make more sense of our world. Hegel's rendition of "ground" in his *Logic* seems to capture the essence of the singularity.

Our ontological bootstrap, then, is singularity in nature. Notice I am not saying ours is a discrete world composed of singularities or monads but that existence emerges from whatever gave rise to the singularity in the first place. What of the "halves", those with half an ontology? These are analogous to notions, more like heuristics, whereas the singularity is analogous to the concept, the formal, or constructed mentation. Reality? Neither is it physical or mental but each in terms of the other, each containing its own contradiction and affirmation, together the reality.

PROBLEMS AND PROSPECTS

PROBLEMS

My framework describing consciousness (mentation) says that in the movement/dynamic field, there is generation and entropy. Correspondingly, in the static field, the same exists. It appears easy to locate the degenerative forces, although, we are observing only the effects. Even at Planck scale, we observe disassociation or disappearance, not necessarily causality, or what ultimately brings degeneration about. In the static field, we observe creation and destruction with the same problem of causation.

It may be that our representational apparatus is not sufficient to convey what mentation really is. For example, if an entity pulsates or vibrates, all directions of pulsating being simultaneous, where are time, boundary, and direction? Perhaps the mathematics does, in a manner similar to describing string theory and dimensions, but if we cannot detect these things, they remain only a part of a model, that is, bootstraps. Too, we need to identify the framework holding the logic-system-model method.

If mentation exists in a static field, how would movement occur in it? I suspect "static" and "dynamic" reflect the insufficiency of our language, but I used them to designate in terms of the most fundamental law, all the of the physical being reduced to movement as movement (cf: fields). Here, we should retrace Heraclitus and Parmenides, one view existing because of the other. Do entities remain in place here? I am not ignoring quantification problems with their inherent deficiencies, not the least of which is human bias. For it to be quantified, it has to be measurable.

The most fundamental in the physical field is motion, a type of difference. I avoided the word "change", as it requires something generating the difference. Through time, it is ongoing. In the static field, because we have no idea what mentation is, we are at a loss to identify the particle version (as in quarks, leptons, and gluons making up everything in the dynamic field) as the smallest of the smallest unit of a thought and what occurs with it in the passage of time. `What they are in the physical and mental fields remains a problem.

How do we know if the model works, even though it may be ostensibly explanatory? Predictive value is standard, but what are those standards, other than the future resembles the past and replication? Then, what is the granularity of precision in the comparison? What of non-conventional research methods, intuition, and Feyerabend's admonitions about there being no method? Then comes the complication of bias and subjectivity, even in double-blind research. What are the criteria for judging "what works"? Pragmatism always has bothered me because of its anarchy, and such can lead down dark corridors. We look about us and settle on what has "worked", not the least of which is the very computer with which I am using to type these words, and behind which lies our apprehension of the laws of physics, scientific methodologies, and so forth. Use these, by all means, but don't be the extreme skeptic. Keep an open mind. *Adelante!*

PROSPECTS AND RESEARCH DIRECTIONS

For consideration and research at the forefront are value judgements, a first one being evil, or malevolence. Extended, I refer to "evil" and entities promoting it. For example, predation involves both the destruction of life and its continuation, but such depends, of course, on perspective (relativity). I often think of Malthus being correct in that wars, disease, natural disasters, and famine are nature's population control methods. That calamities may cancel generative events suggest neutrality in the cosmos. Throughout history in situations completely isolated from each other, individuals have observed similar effects, as in wars, extreme selfishness, anti-social behavior, Genghis Kahn, Hitler, and Stalin coming to mind. On the contrary, history records good Samaritans, philanthropists, and other altruistic persons. What is it residing in these persons that gives rise to their behavior?

The framework has a place on which to hang parapsychological phenomena. A person claiming precognition might claim to reach out into a timeless static field for a monad of thought. However, such would presuppose a timeless universe. Alternatively, It also suggests a deterministic universe, the event already having happened. Psychokinesis indicates an ability to bridge the mental-physical field boundary. Telepathy would depend upon a communications ability analogous to that in the physical field, there being something comparable to the electromagnetic spectrum. Sheldrake's "morphic fields", although rejected by mainstream science, at least is a model for investigation.

My framework begs the question of the laws operating in each field. Do the physical laws (Feynman's *The Character of Physical Law* coming to mind) have correlates in the static field? Are there laws to be discovered in this domain to supplement the physical laws, or would they be independent? How about the boundary condition (Notice I did not say just "boundary".) - if any - between the two? It may be that somewhere in or around the region between the static and dynamic fields lies the creative and destructive processes giving rise to and taking away that which exists in the fields.

I finally am arriving at the animism discussion promised above. I see it not making any sense to deem anything either physical or mental but things as they are because movement as movement ultimately making up what we sense as its static counterpart. This would imply a type of animism, but animism refers more to something physical being sentient. Recall that both the dynamic (movement *qua* movement) and static fields are gradiated. Thus, when asking if rocks think, we realize that reference to "mentation" (as opposed to physical) field is incorrect; it is the static field. As we talk about the effects - perturbations (but not the underlying whatever) in the physical field,

we do the same for the static field. Mentation arises at the boundary between life and non-life, surely a research direction. However, I hope artificial intelligence and biologist scholars take into account the framework presented here.

METHODOLOGICAL CONSIDERATIONS

What are the parameters of exploration? We have been bound by conventional scientific methods, dependent upon the principle of induction - the future resembles the past, and independent replication of research findings. Recalling Feyerabend's *Against Method*, we may have to entertain intuition and the subconscious at least as auxiliary epistemologies. We need to be open to taking non-conventional exploratory paths. Remember the bootstrap method. For example, physicians, such as Richard Gallagher in his admittedly controversial *Demonic Foes*, now are asking about the existence of destructively-oriented beings. A Thomas Kuhn scientific revolution may be necessary to open the door to discovering the nature of consciousness.

Up until recently, most persons rejected the existence of unexplained aerial phenomena (UAP), but finally, the U.S. government admitted their possible existence. The 25 June 2021 report, "Preliminary Assessment: Unidentified Aerial Phenomena", issued by the U.S. Office Of The Director Of National Intelligence [DNI], is instructive on how we may approach the consciousness problem. The DNI lists the categories into which UAPs might fall, four standard, the fifth, "Other":

Although most of the UAP described in our dataset probably remain unidentified due to limited data or challenges to collection processing or analysis, we may require additional scientific knowledge to successfully collect on, analyze and characterize some of them.

In consciousness studies, we seem to know about mentation in numerous ways, mainly characterizing its effects, such as intelligence, the ICD-10, and so forth. Physically, we observe through devices like functional magnetic resonance imaging (fMRI) machines. Yet, that "other" category holds the item, itself, the object of further investigation. A careful reading of the report shows that the DNS, to its credit, has offered only a framework for study - contrary to popular acclaim of U.S. government admission that flying saucers exist.

Another methodological factor is explorations under the aegis of the model need to be interdisciplinary. I see idealists (like those represented on the *Essentia* website) and hard-core materialist physicists siloed, as if the most fundamental law did not exist. It is not uncommon to attend a conference with participants in its sub-conferences unable to communicate amongst themselves, because their work is so specialized. One of my antidotes is becoming familiar with interdisciplinary thinking and methods [Horne, *The rigor of interdisciplinary*, 2020].

For the framework, itself, it would be surprising that this initial construction would not need modification as it is applied to specific circumstances. Again, Thomas Kuhn comes to the rescue, the propagandist in me calling for revolution.

It is understandable that those realizing the need for order and discipline (the generating/creative factors) advocate an institutional structure, such as a school or monastery. Recall the underlying Latin language etymology of religion, seeking that which coheres or binds. Applied to the present case, we are affirming our mental identity by seeking the generative aspects of the static field, just those in the dynamic (physical) domain do their scholarship in discovering technology, medicine, and other creative aspects of our world. Here, I introduce what physicist David Scharf in a recent email to me referred to as "subtle fields". They often are not stark "or "gross", in his word", and, yes, one exists because of the other. As they exist in the physical domain, I see the analog in the mental domain (e.g.: meditation - anger; sleep - awake). Physical evidence? How about an electroencephalogram?

A "technical" note is in order. I have assembled in an interdisciplinary way the views and findings in consciousness research, arguably from a Jack of all trades, master of none perspective. Yet, I see no real framework existing to encompass how these areas might be related. And, there is no framework for relating the tangible and intangible worlds because the most fundamental law has

been ignored. The technical underpinning for the physicists is the mathematical, not the least of which are the calculations involving Dirac's work, Feynman diagrams, Maxwell's equations, and Einstein's work, to say the least. My question here is whether the same or similar conclusions could be reached using logic, arranging in proper form the central ideas arrived at by the mathematical physicists. Arithmetics (from which mathematics emerges) and logic converge as one, a core generating my model. I will leave this proposition for consideration and with my "koan" in which you will find all the logical operators, as well as binary arithmetics following Peano's rules. Both the competent mathematician and logician will know what I am talking about.

p	q	f ₀	f ₁	f ₂	f ₃	f ₄	f ₅	f ₆	f ₇	f ₈	f ₉	f ₁₀	f ₁₁	f ₁₂	f ₁₃	f ₁₄	f ₁₅
0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
0	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
1	0	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

Table of Functional Completeness (TOFC) [Horne, 2011]

PROSPECTS

Artificial intelligence has been one, if not the main, impetus behind consciousness research. Logically, one should know what intelligence is before s/he can create it artificially. Attempting to operationalize it goes back to ancient times with the moving owl of Ktesibios through Babbage's engine to ENIAC, and now quantum computers. Yet, these creations replicate the effects of mentation (incorporating human bias) and do not necessarily contain it. As with life, you need to know what it is to re-create it.

As the world demographic prospects are for an older population, given this planet's limit on population and corresponding reduction of population through both wars, famine, disease, and reduced birth rates, assuming there is no Holocene (Sixth Great) Extinction, and as our environment becomes more complex (and degrades), we will continue to look more to devices that replicate mentation but at an ever-increasing pace. Social problems, in particular, may be too complex for humans to solve, and it would behoove this human subspecies to identify and come to terms with our mentation and how and why it gives rise to our current crisis/conflict-ridden world.

Once the model has been more rounded out, suggesting processes in the dynamic field have their analogs in the static field, a taxonomy of process types can be established. For example, we consider a static field counterpart to the electromagnetic spectrum in the dynamic field in the static. Because there is entropy in the physical domain, so there would be in the static. Taxonomies would have to incorporate the concepts tagged by non-conventional practitioners and dismissed by conventional ones, terms like "meridians", "qui", and "aura". While it is important to remain agnostic, here, it also is critical that we account for experiences people have, especially if they are not explained by conventional means, Gallagher a prime example. As with the framework, itself, these classifications or analogs might change. For sure, biologists have come a long way since Porphyry trees in the Linnaean system.

On another front, existing within this framework with its ruleset are modalities, such as consciousness generating a physical manifestation, or vice versa. In this possible world, what might be the outcome, a path for exploration? What if we alter the rules? Such may be done no-ow, but little or no reference to a framework. Other logics may have a role - tense, paraconsistent, intuitionist, and so forth. What would their analogs in the material world look like? Overall, if we identify an aspect in one domain, we would be asking about the other domain's analog, including the ruleset.

For sure, I have omitted many discussions of substance and scholars in consciousness studies. Yet, what I have found indicates a lack of an investigatory and philosophical framework that is coherent, systemic, and can consistently account for all the mental phenomena (including anomalies). In some ways, we are where the Newtonian physicists were in the very early years of

the 20th century. This is being charitable, as the actual may place us in the era of Samuel Pepys (23 February 1633 – 26 May 1703) or even before, like heaving spears at each other from caves. Too, I have not explored the subtleties of concepts like panpsychism and panpsychism. The more I study the subject of consciousness, the more I realize I don't know. Hence, not only individual collaboration is vital, so is institutional.

Ethics must shape technology, ethics formed by our core values - ethos. 'Nuff said, here, but if we return to being philosophical monks, internalizing the love of truth, we stand a better chance of meaningful discovery.

SUMMARY AND CONCLUSIONS

I agree with Chalmers; consciousness is a "hard problem", if you have only half an ontology, the other half provided by the most fundamental law, consciousness (mental) balanced by the equally important material, or empirical (physical), neither existing alone. Hence, the problem is re-framed, once you accept the law. Such does not mean there is not a consciousness problem, but that there is a larger problem with metaphysics needing answers.

In summary, Cartesianism of the physical has taken us to sub-Planck level, but as material is "all about" what a field "records", I wonder if we have identified what "really" perturbs those fields, the "ultimate reality" of physical. Here, we encounter trying to understand the metaphysical realm, arguably - like Abbott's Flatland - constrained by dimension. Keeping in mind the most fundamental law - the ontology of something existing in terms of what it is not (like a neutral monism, the unity of difference), and all physical being that which is dynamic (in some sense - as in the electromagnetic spectrum) - movement *qua* movement, perhaps we have a corresponding (static) field corresponding to the dynamic, the static being the one in which mentation (including consciousness) manifests itself (as whatever it is manifests itself in the physical field). To accept only the physical, given the law, I suggest is only "half an ontology", the other half the static field in which those manifestations of the mental occur. Regarding both the dynamic and static fields (if that is what they are to be called), these, physical-mental, body-mind, and so forth, each being half an ontology, one existing because of the other, both assume full existence simultaneously, just as initial difference (stasis/movement, discrete/continuum, process/object ...) emerged. What we call those fields exactly is a matter for further exploration, but suffice it to say, I see their half-ontological status.

I do not think it is helpful or even makes any a priori sense to consider vagueness like "... qualitative feel—an associated quality of experience. These qualitative feels are also known as phenomenal qualities, or qualia for short." [Chalmers, 1996, p. 4]". It is like wondering why you feel drowsy without first considering the empty bottle of booze you are holding in your hand. Again, his "... "experience," "qualia," "phenomenology," "phenomenal," "subjective experience," [ibid., p. 6] are effects of something, just as the electronic perturbations registered by an oscilloscope.

Towards a solution requires recognizing the metaphysical limitations, not by arguing they never can be insurmountable (a logical fallacy). We have to accept the mental (consciousness) on the same ontological basis as the physical, with the same epistemology of observing the effects of each from the same perspective. With respect to mentation, we observe the effects if we probe or manipulate an area of the brain or other physical area. Our measurements are through devices like the functional magnetic resonance imaging (fMRI) machines. Of course, there are behavioral effects from physical intervention. Can mentation affect the physical, other than acting through our bodies? Such is in the domain of parapsychological research.

Again, neither the dynamic nor static fields exist alone. Both come into being at the same time, just as with the singularity. That is, both the singularity and the monad nature of the union of the static and dynamic fields emerge from the same source at the same instant.

For consideration is the occurrence where two elements of a difference meet - the LaGrange point, that is, the interface of a boundary condition, creation and entropy, arguably, our imposing either, creating one side of the division, subtracting from the other - and vice-versa.

Applying the most fundamental law to living things (at least "complex ones" - including animals), consider:

The body is the same life as the soul, and yet the two can be named independently. A soul without a body would not be a living thing, and vice versa. Thus the visible existence of the conception is its body, just as the body obeys the soul which produced it. Seeds contain the tree and its whole power, though they are not the tree itself; the tree corresponds accurately to the simple structure of the seed. If the body does not correspond to the soul, it is defective. The unity of visible existence and conception, of body and soul, is the idea. It is not a mere harmony of the two, but their complete interpenetration.

[Hegel, 1883/1896/2002, p. 21]

On a grander scale, including societies, everything has a deep structure, and I see "organism" a viable appellation. Overall, the Universe, itself, is an organism having consciousness. Menas Kafatos did in his 2000 *The Conscious Universe*.

For us? Is it self-deflating to see our bodies with a complex consciousness, but after death, the body breaking down, along with it the consciousness, each of the elements of the consciousness going the way of the perturbations giving rise to the particles. We blend back into the soup of existents giving rise to us in the first place.

So what is the upshot, including all assertions with their analyses appearing in gazillions of scholarly works on every subject? Though the authors and institutions usually do not state explicitly, they are merely putting on their boots, hauling themselves up on a platform, vying for recognition in this dimension's best fashion show. I am putting on mine, obeying "the most fundamental law" (as "ignorance of the law is no excuse"), and arresting the suspect, charging it with being a static field. Yet, who am I, self-appointed judge, jury, and executioner?

I like Shakespeare's line from *Macbeth*:

Life's but a walking shadow, a poor player, that struts and frets his hour upon the stage, and then is heard no more; it is a tale told by an idiot, full of sound and fury, signifying nothing.

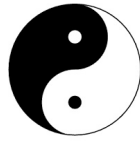
— [*Macbeth*, Act 5, scene 5, lines 16–27]

Perhaps you all have seen or heard my argument, and, if you have, consider mine an independently-arrived at set of conclusions. In the perhaps hundreds of thousands of books and papers, all of which I doubt anyone has read, I could have (and probably have) missed many, including those by the legions of nitpickers. Suffice it to say, though, if there is that paper or set of them, I do not think academicians would still be saying the problem of consciousness has not been solved. Maybe mine is the smile that charms.

Our appearance of correctness, neutrality, and all that is through ourselves to be judged, perhaps, by the quality control department creating this universe in the first place. Do we have any choice, not so much out of faith but sanity, to accept our dimension as it is? I doubt if I am the only philosopher uttering this mundane truth. I never really was a fan of his, but Kierkegaard comes to mind. Yet, if we are to be his existential religionist, it is by internalizing the Latin "to cohere", or bind, coming to terms with some form of monism, singularity, or "whatchamacallit" (whatever else one may call it.). There may a plurality, but let our creator sort it out.

I leave you with a thought perhaps uttered by Charon, himself, the middleperson ferrying us across the river Styx, perhaps escaping the clutches of our self-conflicting dialectical world. Our knowledge is only half an ontology, not knowing the ultimate what or why of anything. We don't even know what life is, or we would have created it. I think you know where I am headed, both physically and mentally, as I am not too far distant from experiencing the dialectic of life, but I also think such may explain the Bodhisattva's contentment in the nirvikalpa samadhi state [Nirvikalpa samadhi yoga, 2022]. I hope to be prepared to swim if the boat tips over.

For now, though, you editors, format freaks, those seeking to publish or perish, and other nitpickers out there clean up the format of this little piece, while you scholars wonder about its content. Before I start pushing up the daisies, I'm going outside to have fun with my cats. See ya'll on the other side!



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Big Think and PBS Spacetime - YouTube

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