

Awareness, Epistemics, and Paradigm Repair

An epistemic lexicon of terms, with definitive explanations

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Abstract: This is necessarily an evolutionary work in progress. Its purpose and goal is enabling real progress of science, mathematics, society, and civilization. Thus, to accomplish the mission, upgrading the current sociocultural paradigm is essential. That makes holistic ontology and optimal epistemics essential to ongoing work and to further development of new theory and metatheory. Hence, the current listings of key terms, definitions, and explanations presented here provide some core concepts and supporting theorems, metatheorems, equations, and examples. That enables remedial revision of relevant domains of thought and discourse. The project is also intended to inspire collaborative extension and ongoing refinement of the work. The appendices provide additional perspective.

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SECTION 1, INTRODUCTION

““A mathematical problem should be difficult...to entice us, not completely inaccessible, lest it mock our efforts. It should be...a guide-post on the mazy paths to hidden truths and, ultimately, a reminder of our pleasure in the successful solution.”” – David Hilbert

As much as possible, this glossary of next-generation scientific terms and definitions is designed for reasonably intelligent lovers of science, mathematics (maths), numbers, mazy paths, hidden truths, and wisdom. Hopefully, the results foster real progress to sustainable success.

After all, Hilbert's quote about problems and pleasure rings true for any branch of science. Yet, as in maths, almost all "standard model" (SM) educators and practitioners of physics, maths, and economics seem to be having too much fun on their mazy paths to visit the scary heights and depths. So, many self-evident realities remain hidden by ever more mystifying SM hypotheses, illusions, and anomalies. That keeps the basic theories and metatheories of the sciences disunited.

Hence, seeing how and why mazy paths now lead to more anomalies than hidden truths (and wisdom) is critical to success. For example, most of us seem unaware of the difference between pure science (and maths) and the more popular, commercialized, technical disciplines. Of course, general ignorance of the history of science and maths, and of axiology, epistemics, semiotics, and the history of language and philosophy aggravate the problem. So, hopefully, this introduction to the essential terms and corrections will foster understanding of holonomic ontology of science and society (etc.).

For clearly, like popular games and successful societies, good science and maths require a shared context, the definitions and effective usage of all the key terms, the elements of a paradigm (the foundation of any society's model of reality). However, using English—or any other human language—to consider principles of a future paradigm of science requires a new way of thinking about communication and reality. For example, consideration of Einstein's new way of describing reality required courageous openness, willingness to question the basis of socially accepted ideas about reality (and religion), and unusually great mental effort.

Likewise, a new metatheory of being and science poses a similar challenge, calling for equal or greater openness, courage, and commitment. That could enable the paradigm upgrade we need to enable more realistic science, saner society, and sustainable civilization. First though, for a major paradigm upgrade—to unify the theories of science and math—the defects and deficiencies of semantics, ontology, society, culture, and our institutional ethics must be exposed, examined, and eliminated. To succeed, we also need to see how a language embodies and expresses inherent cultural bias, illogic, and taboos embedded in modern society's paradigm.

The languages of mathematicians and physicists prove and maintain the ancient linguistic norm. For example, the incredible pronouncements and exotic rhetoric of pop-star quantum mechanics (QM) have become the anti-theistic Word of god (endowing their anti-logical zoo of supernatural particles with magical powers, colors, extra dimensions, etc.). So, instead of decreasing, anomalies and absurdities propagate like a virulent viral infection.

Nietzche foresaw our current crises, with increasing horror and dismay. Among others, Hilbert, Gödel, and Einstein were confused, baffled and, eventually, gave up on their projects. Of course, unifying the sciences (with realistic theory and a solid foundation of logical metatheory) required previously absent knowledge—ideas, concepts, words, and shared meanings. Otherwise, more effective thought and communication about the nature of nature and reality remains absent or unlikely, preventing and/or retarding the progress of science and society.

Hence, the following work in progress covers the core logic of **a**) a next-gen SM of science and society and **b**) the context of necessary theory, metatheory, and a new paradigm. Redefinition of some key terms and principles of the scientific domains of discourse is intended to evaporate the fog of normalized confusion and unrealistic rhetoric. Obviously, physical science specialists are incapable of understanding, dealing with, and explaining the nature of being and its infinite realms of nonphysical phenomena.

So, for the sake of unification and real progress, some terms and definitions reflect or refer to the whole of being (the cosmos) and its nonphysical realities (enabling principles, etc.). Without better concepts and terms—and upgrades of others—better metatheory would remain impossible or extremely unlikely. Also, since maths is so essential to modern science and technology, completing the unfinished foundation of mathematical logic is non-optional. So, re-interpretations of some existing concepts and theorems enable more congruency with nature, reality, and its enabling principles. In some cases, new theorems and metatheorems are provided. Reasons and supporting examples accompany the definitions, redefinitions, and re-interpretations.

Some of the key terms and definitions are listed in approximate order of significance, with priority given to commonly misunderstood terms (re: science, logic, mathematics, reality, principles, particles, etc.). Also, to help foster optimal results, “Section 2” is followed by hyper-linked entries listed in alphabetical order. Yet, please remember, this work is offered as a potential beginning of a team effort, to co-create an evolutionary paradigm of better science and society.

SECTION 2, TERMS & DEFINITIONS

Science: Before it was modernized, science was called natural philosophy. As always, science is study, investigation, experimental and/or theoretical work. Scientific praxis is also testing and verification, performed for the sake of discovery and understanding.

When other purposes are the prime motives, the work should be understood as (and called) either applied science or commercial research and development. However, the prime motive for the new definitions (listed below) was prompted by realization that popular assumptions and misconceptions of and about science and nature have infiltrated nearly all domains of thought and discourse.

For example, the Quine-Putnam indispensability thesis (QPIT) is important for the development of better metatheory of metamathematics (metamaths) and next-gen mathematics (maths). It, the QPIT, relies on the assumption that maths is indispensable to science. The authors claim that we can rely on valid theories of science. Also, since many believe in current theories of science, we should believe in the indispensability of maths.

However, like any other scientific theory, the QPIT is disputable and falsifiable. Yet, maths is a science and a semiotic system (a language). Therefore, it can also be a scientific toolset for doing technical work, or for proving or disproving any kind of theorem. For example, to disprove the QPIT we need only 1 example of science that does not depend on maths. For instance, philology is a science, an investigative discipline

performed for the sake of discovery and understanding. So, we can use philology to test the QPIT.

Philology requires studies of language, culture, literature, and history. Yet, maths may be part of a culture and its linguistic paradigm, but not necessarily required to do the research and new theory of philology. The best example though, from Riemann via Hilbert, is maths itself. Consider this, instead of using many complicated mathematical operations and exotic symbology, Riemann preferred explaining “the ideas” required for a theorem or proof (with words).

Clearly, that may sometimes seem more difficult. Yet, any principles, phenomena, or processes we understand well enough can be proven and explained without using symbolic values (numbers) and the semiotics of maths. So, that falsifies the QPIT. Still, mathematics is a logical language and a way of understanding realities. Thus, using ordinary language to study and describe mathematical realities is a valid use of the concepts, logic, and methods of science, mathematical thought, and theory. So, that validates the QPIT. Obviously though, both modern maths and most sciences now suffer from inherent linguistic, theoretical, and logical deficiencies, paradoxes, and absurdities.

Therefore, a prime aim and use of real science is discovering or recognizing and correcting current deficiencies, paradoxes, and absurdities that prevent or limit progress and better results. Clearly, ignoring or trying to deny discoveries and better theory (to hide or maintain defects of obsolete theory and inadequate results) is anti-scientific.

Anomalies: Realities that exist despite the inherent deficiencies of a current theory and its sociolinguistic paradigm (the conceptual context of current thinking and discussion about being, etc.) are called anomalies. Clearly, at best, theories are composed of ideas, beliefs, assumptions, facts, and truths represented by words, nomenclature (the names of observed phenomena only partially described by current theory).

Obviously, the whole duration of a natural phenomenon (and its ever-changing totality) can never be fully described by a theory, which is why all valid scientific theories are falsifiable. Anomalies are landmarks, blind-spots, misconceptions, misperceptions, misinterpretations, and warning signs at boundaries of a society’s paradigm, its mental territory and worldview. They reveal weaknesses, inadequacies, and fallacies built into languages and incomplete theories about being (and nature).

The exceptions to these truths are holonomic metatheorems based on understandings of the basic principles of being, or the whole basis of a logical system, such as a language or game, or maths, geometry, software, and so on. So, unlike immature theory, viable theory based on holonomic metatheory eliminates or minimizes anomalies and inadequate axioms (etc.).

Axiology: Axiology is the little-known, under-appreciated, and under-developed science of value and values. Now, in Euro-American academia, axiology is considered a branch of philosophy. However, philosophy and all other branches of science are really branches of macro-ontology. So, good ontology and philosophy both require optimum axiology.

It may seem odd to include axiology here, but not doing so would be a mistake. In fact, not understanding the true nature of value helped subvert modern society, economics and, thus, also physics and maths (etc.).

For example, deficient axiology fostered and maintains chronic deficiency of ethical integrity and intellectual responsibility. Even the practice of axiology itself suffered from over-technicality and the pandemic penchant for valuing quantitative materialism and sciencey rhetoric (for conformist credibility) over substantial benefits and progress. That lets it 'work' inside the social silos of a tiny minority of academics.

To foster better, truly holistic science and maths, we need bio-ethical axiology. If we achieve that, as an essential element of macro-ontology and meta-ontology (the science, theory, and holonomic metatheory of being-as-a-whole), axiology can foster and support ecospheric consciousness, a saner paradigm of society, and a new era of STEM education (and cultural wellness).

Ontology: It (ontology) once was and still should be the scientific study of the totality of being. Ontology was hijacked and subverted by medieval Western theologians and, most recently by neo-sophists and technologists. The ontology of classical and post-classical philosophy were limited by the acceptable knowledge and languages of society.

This era of civilization and science needs truly holistic ontology. Yet, to be sustainably viable, it must consider and address the actual wholeness of being. It must also be as evolutionary as being, a holotropic holontology (macro-ontology and meta-ontology), as if the whole of reality matters. Naturally, being-as-a-whole is the only all-inclusive, all-encompassing reality (the universe, and its meta-energetic, metalogical nature). Therefore, all other sciences (and fields of philosophy) are subordinate subsidiaries of holontology.

Hence, holonomic phenomenology is essential to macro-ontology. Of course, nobody can know everything about all phenomena, but we can understand the nature of being and reality. The nature of being is its elemental, enabling, sustaining principles. Physicality is only one of being's subsidiary principles, balanced and complemented by mentality. Thanks to it we may perceive and understand the other principles of form, structure, functionality, and relativity enabling and sustaining being, the cosmos, and experience. (See def., Principles)

Philosophy: The love of wisdom (philosophy) existed long before the philosophers of ancient Greece. Yet, most of history was written by conquerors, most of whom were cultural chauvinists. So, the paradigms and attitudes of ancient Greece and Rome heavily influenced those of more modern European societies.

Therefore, the modern Euro-American sociocultural paradigm and basic attitudes still foster and support chauvinistic philosophy, narcissistic egoism, and subliminal conceit. Hence, students, teachers, and practitioners of Western philosophy are free to ignore superior examples of more holistic, realistic philosophies of India and Asia. For example, the purpose and focus Buddhist and Vedic philosophies is the development of a more realistic understanding of the nature of reality and being, not just the nature of a philosopher's ideas, assumptions, rhetoric, and systemization (of concepts).

The rise and fall of Friedrich Nietzsche and Nazi Germany provided one of the most tragic counter-examples. Of course, if Nietzsche had studied all of Asian philosophy and devoted himself to Buddhist training, Adolph Hitler may have done his worst anyway. Yet, it seems very unlikely that Hitler could have perverted a Buddhist Nietzsche's realizations so easily and atrociously. It also seems unlikely that Nietzsche would have

suffered such crippling, terminal mental illness.

That seems probable because the context and aim of Buddhism is serenity, harmony, ecospheric awareness, and appropriate interaction. Now, that requires more than an intellectual attitude of utilitarian pragmatism. It takes progressively constant practice, more like dynamic psychotherapy. However, success is fostered and supported by the results of progressively effective phenomenology, ontology, axiology, psychology, and training methods developed over nearly 3000 years.

In other words, until modern western philosophy fosters, achieves, and sustains an integrative, truly holistic paradigm and domain of discourse, it will not equal the logical, intellectual, and functional integrity and results of Buddhist philosophy and practice. Of course, getting tens of thousands of modern western philosophers to give up their addiction to disintegrative academic competition, mental gymnastics, and egoic supremacy seems like an insurmountable challenge. Regardless, IFF the holotropic paradigm of holontology goes viral, the best-case results may be possible before mass-extinction resolves our problems.

Phenomenology: A phenomenon (*pl., phenomena*) may be physical and/or only virtual. It can be a thing, being, or event. It may exist in/as a form, an object, a process, an event as a group or set. So, principles, concepts, and other nonphysical entities are actual virtual phenomena.

Knowing everything about the totality of phenomena or even just one phenomenon is impossible. So, holonomic phenomenology is the science that studies and tests the nature of phenomena and what we can know them.

For example, we can know about “external” and “internal” phenomena because of mental and physical phenomena. So, we can understand them as physical and virtual or nonphysical a) things, b) processes, and/or c) events. The cosmos is a perfect example of a thing that is also an event enabled by its integral processes and all other phenomena. So, we can consider the cosmos as a whole as the totality of being, including all its enabling metalogical principles, because of our sensory processes and mental abilities.

We can also consider all phenomena as exhibiting properties of several kinds or classes, for example: a) real and unreal, b) logical, metalogical, and illogical, c) physical, energetic, visual, sonic, and mental, and/or as d) knowable and unknowable properties. So, we can understand the nature of truths because they are congruent with reality; and lies, delusions, illusions, and erroneous theorems & opinions depend on unreality. Thus, we can also understand logical and metalogical principles that enable real phenomena, like good theory, valid metatheory, and being; and we may then detect what fails to enable realities and good theory or metatheory.

Of course, the various kinds of natural phenomena enable our experience of the “field” of being’s energetic and meta-energetic phenomena as a) objects of perception & consciousness, ideas, etc., b) sounds, light, colors, forms & places, electrical & magnetic processes, forces, effects, matter, events, and as c) knowable things and events, or as unknowable phenomena. Fortunately, nature’s metalogical principles include and enable mentality and its properties & potentials. So, ideally, we can discern the knowable from unknowable phenomena, and recognize both reality and unrealities.

However, we can also classify phenomena as either natural or artificial. That can be useful in determining whether a thing (or effect) is a product of natural processes and

principles or of unnatural processes and illogic (or defective mental functioning). For example, claiming knowledge of unknowable events is a product of artificial illogic. Reality, the natural presence (of being) expresses and embodies itself as phenomena. They are enabled and characterized by their innate principles and properties that determine their nature and potentials. Each apparent expression of being is a distinct yet ever-changing form of presence.

So, although properties of transient phenomena and conditions may change, the nonphysical phenomena we can call intrinsic enabling principles remain reliably constant. The relativity and interdependence of principles, forms, and modes of being enforce the interdependent relativity of all phenomena. Whether virtual or overt, the individual identity or actuality of a phenomenon is a subsidiary aspect or element of the wholeness of being. So, for example, a sentient being's perceptions are always psychophysical phenomena.

Yet, not all such phenomena are simply perceptual. Theoretically, the existence of the universe and other phenomena (events, etc.) require no perception, nor individual perceivers. Yet, we exist, and phenomena are compound results of dependent origination and transformative interaction. However, the intrinsic metalogical principles of nature are exceptional, essentially atemporal attributes of being (as a whole). So, being neither transient nor separate from the universal nature of being, its metalogical enabling principles enable presence and our awareness of phenomena, mentality, and minds (etc.).

Ecology: "Eco-" comes from ancient Greek *oikos*, originally referring to hearth and home. Realistic ecology is holistic ecology. So, bio-ethical axiology, holonomic macro-ontology, and a valid metatheory of meta-ontology make the foundation of good ecology.

For example, for the ancient Greeks and cultures more well-connected with the nature of being, the meaning of "ethos" related the nature, essence, and ways of a place. For people of the most ancient cultures, the nature and spirit of home—shelter, habitat, cosmos—and their world were not separate. Even today, some members of the Hopi, Lakota, Cheyenne, and all other traditional indigenous cultures are more truly expert ecologists than most post-grad students and practitioners of the modern discipline. In other words, without unlearning modern civilization's disintegrative socialization (of ego, cognition, consciousness, and habit), realizing ecospheric awareness, ecological insight, and reintegrating our nature and mind that the nature of being and reality is virtually impossible.

So, if the future and fate of all life on earth matter, then optimizing modern ecology matters. Naturally, they do matter—now more than ever—and so, truly holistic ecology, bio-ethical axiology, and holonomic macro-ontology are essential for achieving our best-case results. Of course, that implies and requires much more than reform of education and politics. Rescuing civilization from itself requires a global psychosocial quantum leap, equivalent to an unstoppable nuclear fusion chain-reaction (or a miraculous spontaneous remission of normally incurable stage-four cancer).

For the fast track to success, ideally, all the Life Science teachers, biologists, climatologists, and ecologists will start practicing and supporting interdisciplinary research and development. Obviously, that requires a unitive paradigm and domain of discourse that can only be enabled by optimum theory and metatheory of macro-

ontology. (See Holontology)

Semantics: Semantics give languages their currently accepted meanings and nuances. Hence, the unfinished definitions and metatheorems of the philosophies of science and mathematics were limited by deficient **a)** philology, **b)** linguistics, and **c)** semantics. As in all languages, the semantics of science and mathematical linguistics and semiotics are equally definitive. Likewise, they deserve and need evolutionary revision, better theory, and better metalanguage of the governing metatheory. Hence, effective semantics are critical elements of post-modern science, maths, metamaths, and proofs.

Unfortunately, generally accepted theories, assumptions, and beliefs of groups of users of languages determine the scope, content, and intentions implicit in their languages and their semantics. So, societies' different languages tend to limit 'subversive' communication with inherently dynamic conservatism. Groups of mathematicians of the various subdisciplines are no less subject to currently accepted norms of their current paradigms.

Only when a group's fundamental paradigm, its standard model (SM) of 'reality' is revised does its language change or evolve. Yet, a group's semantics reinforce and limit the scope of its inherent philosophy, its paradigm, its current *understanding* of reality, and what thoughts are thinkable. Neils Bohr thought that major scientific revolutions happen when the last of a paradigm's defenders are buried. Until then, new theory, meanings, and new philosophy generate negative reactions, hostility, and worse.

Epistemics: Meta-ontological epistemics is the holonomic study and praxis of the modes and mechanics of knowing, meaning, connotation, interpretation, implication, reasoning, learning, and knowledge. So, mastering epistemics requires extraordinary knowledge of anthropology, sociology, philology, semiotics, linguistics, semantics, world history, literature, and philosophy. Clearly, optimal science and metatheory require optimum phenomenology, ontology, semiotics, and epistemics.

Yet, the sociocultural paradigm of modern science and maths failed to foster and support adequate study of the basics of holistic epistemics. Limited by psychosocially enforced deficiencies, the domains of discourse, theory, and metatheory of modern science and maths were retarded and (mostly) subverted (for the sake of commerce and normalized greed).

Unfortunately, any group's semantics are enculturated psychosocial constructs. So, without adequate epistemics, optimal semiotics, semantics, and communication are impossible. Hence, a valid definition and praxis is essential for optimal ontology and science in general.

Semiotics: Semiosis, communication, is an integral functional property of being, life, and intelligence, also an intrinsic property of life. So, cells, flowers, and most animals use chemo-semiosis. Some beings also use sonic semiosis for direct expression and interaction. Our human languages are semiotic and mostly symbolic.

Semiotics is the logic, praxis, and/or use of symbolic communication. Natural metalogical principles make linguistics (and its branches) subsidiary to semiotics. Its purpose and aims involve **a)** transmission of information or meaning, **b)** increasing knowledge, **c)** developing wisdom, understanding, **d)** gaining advantage, and/or **e)**

enhancing quality of life.

For example, mathematics and semiotics are inseparable, but semiosis is an expression of metalogical principles and properties existing independently of and prior to maths (and all other human languages). Hence, semiosis proves the existence and nature of mind, and mentality, its prime enabling principle. Semiotics also proves the existence of logic, activity, and the trinity of mind, voice, and body.

Some physicists believe that information is a primordial constituent of universal reality, intrinsic to all forms and structures. Yet, without minds and communicators—and without any mentality, receptivity, transmittivity, and other natural principles of being—information would be meaningless, at best.

Information and concepts are objects of consciousness, ideas, illusions, assumptions, opinions, and facts, enabled by principles and semiosis. Without communication (transmission and reception by sentient beings), information is a meaningless impossibility. Anyone who thinks otherwise is either confused or incredibly ignorant or both.

The linguistic nature and functionality of mathematics exist in interdependent relativity with its enabling principles and semiotic expressions. The sublanguages of mathematical logic are perfect examples of semiotic code, enabled by its extensible systemic operational logic. The self-evident importance of semiotics makes it essential to holistic science, macro-ontology.

Systems: Many ordinary scientists and people seem to misunderstand the difference between systems and living organisms, cultures, and biomes or habitats. For instance, a living being's "nervous system" is not a system; and neither is an immune system. The functioning and interactions in and between cells and organs of living beings are enabled by the metalogical principles of being (its nature), by life, not a system.

However, nature's enabling principles make logical systems possible. For example, a system can be an abstract mental construct or process, like an algebra or algebraic formula, the whole of mathematics, or any kind of logic system. A system can also be a physical invention, or a transfinite phenomenon, like a language, a software program, its defining content, or its output. Naturally, systems can also be much more complex. For example, societies and nation states are complex inventions made of beliefs, ideas, assumptions, illusions, delusions, opinions, rules, and laws. They enable the limitation of groups, association, relationship, interaction, and governance.

In other words, a social system limits a group's cultural activity. Because a social system can and usually does subsume and determine the nature and potentials of a culture's linguistic system, a society can cause mass-confusion for the sake of a current state of relations that favors maintaining a social power structure. For example, keeping 99.9% of people confused about society, culture, nature, and systems favors ongoing social control by elitist exploiters, now less than 0.01% of a population. Hence, those who understand the differences between themselves and essentially mechanical elements of a system of systems have an exploitable advantage over the others.

What should seem the most obvious and horrific example of that is the ongoing ruin of our psychophysical habitat (our world and Earth's biosphere) to maintain ecocidal consumerism, pandemic hubris, also the whims, status, and profits of less than 8 million psychopathic egos. Yet, the solution is possible and growing more likely, daily. That

possibility is enabled by the nature of both reality and humanity.

For example, human societies are systems made up of concepts, illusions, and arbitrary rules that change over time. Most causes of social change are problems caused by the system's defects and deficiencies of the cultural paradigm (the current set of notions and beliefs about reality). So, when a society's problems, defects, and deficiencies become generally intolerable, radical change can be pervasive and rapid. Of course, depending on the final severity and extent of the problem's consequences, a whole civilization may not survive a long era of defective society. World history is littered with the remains of deficient civilizations, ruined empires, and societies that failed to correct their defects.

Clearly, a general understanding of what systems are, and are not, is important to realistic ontology, science in general, and resolution of the world's rapidly worsening crises.

Principles: Principles enable natural phenomena, including other principles. They can also enable the existence and expression of new principles that were only pre-existent potentials of an enabling principle or ensemble of enabling, empowering principles. So, though principles are immaterial (nonphysical) phenomena, they have morphic, structural, functional, and relative priority over all the mental, semiotic, and physical phenomena they enable and sustain.

For example, though no other existential phenomena can have priority over a universe of all possibilities, potentials, and actualities, we can admit that it and all its virtual and material actualities are enabled and governed by its intrinsic metalogical principles, the most irreducibly elemental constituents and properties of its nature.

Remember, the word "principle" comes from *principium* and *princeps*, for first, primary. Unlike other universal phenomena, principles are the most primal, primordial enabling elements of the universe. They enable the properties, qualities, and potentials of physicality (the principle) and energetic phenomena.

So, our perceptions and sensations of solidity and forces are actually of the embodiments and/or expressions of nature's enabling principles. However, a principle is either a purely noëtic (virtual or psychic) phenomenon, or else a nonphysical element of logic or metalogical meta-energy. Primal principles enable the beginning, foundation, and existence of everything. The primality and immutability of principles ensures that.

As elements of being, its most primal principles are generative elements of universal phenomena, the universe, and its infinite totality. Being's intrinsic creativity is an example of a primal generative principle, enabling and being enabled by the other basic principles of being, like physicality and mentality. So, we can understand the realities of psychophysical energy and matter as complex results of the principles of nature's logic.

However, consider the prime dilemma of modern SM science. Some physicists believe that there is information—independent of any mind or mentality—in seemingly mechanical (non-living) phenomena, elementary particles, or in 'dark' phenomena. Yet, they offer no explanation of how or why information could be present without mentality and semiosis.

In fact, materialists offer no explanatory information about mind; and a truly satisfactory definition of "matter" has been missing for more than a century. Yet, mentality is a functional principle that enables our creativity, intelligence, awareness,

thought, and communication—as integral, universally pervasive potentials of being (the cosmos).

POP: In mathematics, the principle of permanence (POP) enables proof and verification of technical functionality (of equations, formulas, operations, theorems, etc.). The POP also enables durable reliability, because no natural forces can change nonphysical principles (enabling it, etc.). So, the POP remains durably changeless, and permanence is not simply an idea or concept dreamed up by mathematicians.

The POP exists because the enabling principles of semiotics, maths, logic, and being cause and sustain the changeless constancy and reliability of nonphysical, logical and metalogical phenomena (including mentality, maths, theory, and proofs). Of course, if that were untrue, there would be no durably persistent natural patterns, forms, and modes of being (and its elemental energy, matter, us, etc.). So, we can rely on nature’s principles to keep on enabling its actual and virtual reality.

Obviously, definitive holonomic macro-ontology and meta-ontology of actual and virtual reality, of nature and science are enabled and sustained by the POP. It enables and sustains all valid maths, science, proofs, verification, and technical methods.

Logic: Typical dictionary definitions of logic usually rely only on logic’s relationship with language, maths, propositional logic, and what makes sense within a context of shared knowledge, beliefs, biases, agreements, and artificial systems of axioms and rules. Yet, DNA encodes a quadrinary language of life. RNA embodies and expresses life’s intelligence using a biochemical (molecular) quadrinary code (its language).

So, we can accept the reality of nature’s logic as a metalogical language of being. Clearly, nature’s enabling metalogical principles are intrinsic expressions of its intelligence and mentality (the functional principle that enables mind, thought, science, etc.). Otherwise, DNA, RNA, human beings, and our languages and artificial logics would be impossible. In fact, maths can correlate with nature because its logic is enabled by natural metalogical principles.

Nature helps us describe natural events, processes, and so on. So, maths may seem to be the language of nature or God. Yet, clearly, DNA and RNA prove that nature’s language is being and all forms of expression and communication, its semiotics and meta-semiotics. Its meta-language is its metalogical principles, enabling and informing the meta-semiotics and existence of all things, all processes, and all beings.

Also, all ways of communicating depend on and express the meta-semiotics enabling them and their potentials. So, the principles and semiotics of the universe and all beings are nature’s language, not maths, and not artificial logic. Nature’s meta-logic is clearly sufficient, and necessary for enabling the totality of universal presence, and life. Being’s metalogical principles are of several basic kinds/classes:

- ✦ Original/actual: primal generative principles enabling all phenomena
- ✦ Formal/morphic: enabling all types, modes, and properties of form
- ✦ Structural: enabling all modes and properties of structure
- ✦ Functional: enabling and governing all kinds of functions
- ✦ Operational: primal principles of relativity and interaction

Clearly, the levels of nature’s principles are nested, arising with and enabled by the

original metalogical principles (of being). Morphic, structural, functional, and operational levels of principles are interdependent yet ordered per priority of their nature and potentials. Some principles, expressions, and embodiments evolve or derive directly or indirectly from and with the deeper levels of being.

For example, all embodiments and expressions of metamorphic principles derive directly from and depend on the generative original principles. Yet, forms require and enable structure; and they enable functionality and operations, all empowered and enabled by relativity, actuality, energy, and meta-energy (the primal expression of activity). Unlike artificial systems and principles of logic, all principles of morphic, structural, functional, and operational metalogic are interdependent, ordered, and nested. They are emergent potentials and results, enabled by the more primal principles. Maths provides examples of practical systemic logic we can categorize as ordered, and others as bivalent, existing as both nested and ordered expressions of semi-artificial logic.

Some of the greatest hypotheses, conjectures, and theorems of the great pioneers of science and maths deal with multivalent nested logic. Yet, all kinds of logic depend on and express enabling metalogical principles. Therefore, understanding natural principles enables the best proofs of hypotheses, theorems, and realities expressing those principles.

Property: The principles that enable and govern all phenomena give them their characteristic properties. Properties are integral to principles and to being. Form, structure, function, and all the other principles and modes of being, give each phenomena its unique properties, its actuality, its identity. For instance, the basic arithmetic progression, $S_{N \rightarrow \infty} (0 + 1, n + 1 \dots \rightarrow \infty)$, is unique, always what it is, not like any other operation or result of maths. The changeless principles and properties that make it so, ensure identical results with every instance of its use.

Property, the principle, is essentially important to the holotropic metatheory of post-modern metamaths and holonotology (macro-ontology & meta-ontology). The defects and crises of metamathematics, economics, QM physics, and cosmology are partially due to failure to understand the true nature of property and properties.

Chaos: Order and chaos—like organization and disorder—are interdependent concepts, relative complements and functions of each other. Yet, since the rise of chaos theory and complexity theory, chaos isn't what it used to be. For too many of us, chaos is a quasi-mystic buzzword, mainly used for masking pretentious ignorance.

For example, chaos is not entropy, and neither are what they may seem to be. Most of us clearly misunderstand chaos, or rarely think of it, if ever. Naturally, because of the rise of large-scale civilizations—and the exponential increase of complications, conflicts, wars, theologies, etc.—some of the confusion existed before modern chaos theorists. Before then, possibly for more than 2 million years, chaos, order, and entropy were impossible, because nobody named them. Surely, some of our earliest ancestral forerunners noticed patterns and what seemed to lack pattern. However, without names to define them, objects of our subjective consciousness remain integral aspects or modes of the way of being.

In other words, because we notice and accept the reality of order, we foster and

sustain our notions and normative perceptions of chaos and entropy. However, what happens is being and constant change, the ongoing transformation of the universal moment of presence. Of course, the elements of matter and the natural geometry of planetary orbital mechanics, molecules, and crystals prove that being prefers order, organization, and what we think of as negentropy. Thus, what may seem like disorder and entropy are really phases of energetic transformation.

So, we see the best example of chaotic disorder in all the artificial absurdities and atrocities caused by pandemic confusion about the realities of being (and the nonphysical principles that enable them, and us). In fact, being is negentropy, order, and organization. Energy is the activity of being's reorganizing of its forms, structures, domains, and subsidiary subfields. Hence, the only energy that ever gets lost is the mental meta-energy of normal egos and lost opportunities (for realizing more wisdom and better quality of life on Earth).

Yet, even the meta-energy of mind and thoughts is never really lost; and not simply because it was never physically vulnerable, but because it can only be transformed. No energy is ever lost or destroyed. For example, physicality and mentality are interdependent principles that enable our experience and awareness of matter and nonphysical phenomena. That lets us think of the field of being (the cosmos) as being mainly ($\approx 96\%$) hyper-luminal hyper-energy and meta-energy, not "dark" energy and "dark" matter. Modern astronomy reveals the effects, and the dynamically fluidic nature of the hyper-luminal modes of energy.

So, that—and the existence of the nonphysical metalogical principles that enable being—exhibit the integral interdependence, dynamic interactivity, and inseparability of **a) luminal energy, b) hyper-energy, and c) meta-energy**. Regardless, the normally socialized egos of most modern astronomers refuse to consider a realistic alternative to their "dark" labels and ever more chaotic mish-mash of increasingly ridiculous excuses (for their obsolete theory). Hence, as the current paradigm and trend of modern science generate more data, more knowledge, more technology, more projects, and more financially profitable commerce, they also cause more anomalies, confusion, absurdities, disrespect, and negative reactions.

Of course, due to relativity (the principle), the effects, the reaction and changes are directly proportional to the scale and extent of the causes. So, we can be sure of the system's conservation of energy and meta-energy and constant fluid mechanical flow.

In other words, the same set of enabling principles of being and activity govern all domains of energy (elemental, luminal, etc.). So, as in the regimes of intra-galactic and inter-galactic energy flow, major scientific revolutions and radical social change exhibit properties enabled by the principles enabling fluid mechanics. Clearly, all the clues, hints, and amazing "secrets" of the universe (being) were hidden in plain sight, in and all around us. So, holistic ontology, realistic physics, psychology, sociology, and good government clearly require a realistic definition of chaos.

Metamorphism: Physical forms constantly change, but not the metamorphism of the metalogical principles of form and structure (etc.). The nonphysical, meta-energetic, meta-structural integrity of natural principles keeps them beyond all causes of change.

The ensembles of principles that enable the forms, properties, functions, and potentials of phenomena (including principles, properties, processes, and events) are

sustained by the intrinsic metamorphism of being and all its enabling principles. If that were untrue, then there would be no reliably constant possibility of form, structure, physicality, knowledge, and science. Yet, reality and science exist because being's metalogical principles exist and enable all transient physical and mental phenomena, properties, processes, and events.

Form: Form is the primal morphological principle of being that enables appearance, presence, shapes, and the modes of things, processes, events, and bodies.

Despite the opinion of architectural sophists, form does not follow function. Form, structure, and function are inseparable, interdependent, and integral to all phenomena, either virtually or overtly. To exist, everything must have a form, even the undetectable seemingly formless field of 'dark' stuff we thought was empty space.

Even the most basic principles, at the very subtle level of nōetic phenomena, have form, logical structure, functionalities, and operational potentials. Elements and components of structure have forms. Without form there can be no structure. However, because of relativity and integrity, the metalogical principles, there can be no form without formlessness.

Like nothingness, formlessness has only virtual existence (as a concept) relative to what it is not, each and every actual thing, however subtle or virtual. The primality of form is self-evident by the fact that every kind of structure is the structure of a form of being or a thing, and every component of a structure has some kind of form.

Forms can be seen and known as dimensional, as shapes or appearances, or as nondimensional, like principles of logic and ideas, or other subtle, virtual forms. So, the form of form, the principle, is all forms, including itself. Emotions, speech, and sounds are examples of subtle, transfinite forms. For example, numbers and other symbols have very subtle, virtual forms, expressible as actual forms, symbols, objects of perception and consciousness. The ensembles of metalogical principles they embody and/or express determine the nature, attributes, properties, and potentials of forms.

Structure: Structure, the principle, enables and sustains the forms and integrity of phenomena, things, all forms of being, even principles, numbers, and identities. Meta-structural principles enable the integrity and durability of principles, elements, molecules, cells, organs, bodies, groups, cultures, societies, organizations, systems, and languages. For example, maths is a systematic language of symbols, values, functions, protocols, rules, and procedures enabled by the principles, attributes, properties and potentials that constitute its structural logic and geometric relativity. The nature, properties, and potentials of a structure are determined by the ensemble of metalogical principles it expresses or embodies.

Functionality: Without understanding the nature, meta-logic, and actuality of functionality, fully understanding the nature of numbers, maths, functions, and semiotics is impossible. The functionality of maths and maps is not a magical invention of mathematicians.

Minds and logicians exist because functionality is essentially a metalogical principle of being. The convenient relationships of mathematical functionalities to physical functionalities are no accidents of a mechanical cosmic automaton. In the explicate, overt

order of existence, function is subsidiary to form and structure. Yet, in principle, functionality is integral even to the basic generative principles of being, the primal metalogical principles, and to every embodiment and expression of form and structure.

Thus, we can understand the metalogical principle of functionality as intrinsic to all expressions of activity and energy, to the nature of being-as-a-whole, and its momentary totality. We can also understand the functional properties of physical forces, processes, and events as expressions of nonphysical functional principles: actuality, causality, activity, motility, mutability, luminosity, visibility, etc. So, functionality enables the properties [of the principle] of physicality and its energetic expressions and embodiments.

Relativity: Albert Einstein did not invent relativity or dream it up. Universal integrity enables and sustains the logical relativity of all principles, phenomena, and potentials.

Without relativity, the principle, the whole of being would lack integrity, symmetry, asymmetry, nondual polarity, complexity, simplicity, and other complementary relations required for being, life, awareness, consciousness, maths, and science. The distinct relativities of overt phenomena (we think of as physical) are expressions of actual relativity and the other principles (that enable and sustain everything).

Plato was relatively correct, in principle. Nonphysical and mental phenomena are more real to us than all the ever-changing phenomena we perceive and think of as purely physical. Yet, science and maths were retarded by the idea that governing principles, symbols, numbers, functions, and their potentials are purely mental fabrications, unrelated to being and the enabling primal principles of its nature.

However, mathematical symbols, protocols, and operations are natural, logical, psychophysical phenomena, relative to everything else.

For example, all phenomena—including mathematical expressions and the realities they represent—are as inseparably interdependent as the principles of physicality, mentality, and the other nonphysical principles that enable and sustain them. In fact, the whole of being, the totality of absolute reality, is nondual, neither purely physical nor only virtual/illusory.

Essentially, all beings and our phenomena are enabled by relativity and/or virtuality, physicality, and mentality. Our dichotomies and anomalies are artifacts and defects of human languages, sociocultural conditioning, and normal modes of thought, not defects of natural relativity (which is constantly perfect). Therefore, fully understanding the metalogical principle of relativity is essentially important to the theory, metatheory, and understanding of being, science, maths, and proof.

Activity: Energy is action. The essence of energy is activity, the functional principle. Activity, an essential functional principle, enables energy, being, life, and the other functional principles.

Though potency may not seem to need it, without activity the expressions and effects of functionality (and all the other elemental enabling principles of being) would be impossible. For example, the instantaneous interaction of causes and effects of being, expresses its energy, its activity. So, activity, energy, interaction, transactions, liveliness, physicality, and mentality are essential, equally interdependent elements of the functionality of being (and its natural actuality).

Obviously, without the active expressions of mentality, there could be no mental activity, and no intelligent living beings. Yet, we are living proof that activity enables even the meta-energy enabling the many expressions and embodiments of mentality and intelligence.

Creativity: Creativity, the functional principle, is intrinsic to being as a whole. Whether there was a sudden beginning from absolute nothingness nowhen—with a big bang of everything in the middle of nowhere (prior to the existence of explosive processes), or an evolutionary emergence from a beginningless infinity—creativity was essential, at least as a potential or implicate principle of being.

The universe clearly exists, as it is, thus creativity exists, and vice versa. So, we see creativity in the existence of the universe itself, as physical and nonphysical elements, in the ways of living beings, in artists, even in the works and results of the pioneers of maths. In fact, this dictionary of holontology (macro-ontology and meta-ontology)—the definitions and explanations of natural reality—is enabled by natural creativity.

For example, the ideas that enabled discovery of the structure of DNA and the amazing mathematical discoveries of Ramanujan were inspired by dreams. Likewise, the results of this work (of research and development) were enabled by a combination of conscious and subconscious causes, processes, and contributing factors, enabled by the principle of creativity. Obviously, creativity also enables the cosmic balance of entropy and negentropy. Also, the Nobel prize winning work of Dr. Ilya Prigogine proved that negentropic complexity is counteracting cosmic entropy. So, illogical notions, unrealistic absurdities, and obsolete hypotheses to the contrary are unnecessary.

Poesy: Poesy is a principle of being. It, and the other enabling principles of semiosis (communication) and creativity, enable the creative use of language. So, the principle of poesy enables far more than poetry, lyrics, prose, and verbal fictions.

All great breakthroughs of scientific discovery and theory required and involved use of creative communication and explanation, enabled by poesy. Before the advent of writing, reading, and general literacy, the transmission and recording of knowledge was enabled by memorization, enhanced by using poetic phrasing, chanting, and/or singing. In fact, archaeologists and paleo-anthropologists have ancient evidence that music was more important to our early ancestors than it is for us now.

In fact, living cultural memory of ancient indigenous nations is still preserved and enhanced by traditional songs and chants. Therefore, the development of language and the evolution of different languages must have been caused or influenced by the songs, poetry, and chanted histories and legends of our ancestral poets and storytellers. By the time of Plato, some noticed that changing modes of music and song preceded major social change, revolution, or civil war. But the 1300s, poesy enabled wandering troubadours, bards, poets, and other free thinkers of Europe to exchange and support new ideas and radical social change.

Otherwise, there could have been no scientific revolution, no evolution of modern civilization, no rock & roll, and no rap or hip-hop. Of course, it may not be able to save the world from our monstrosity, but the best of humanity would be impossible without poesy. Clearly, the principle of poesy is as essential for meta-ontology and good education as it is for poetry, literature, opera, and religion.

Musicality: Like poesy, musicality is a natural principle of being. Unlike poesy, musicality is the most ancient mode of semiosis—symbolic communication. If it were not an intrinsic principle of being, then birds, baby birds, and other animals could never sing or be heard.

In fact, we now have no good reasons to doubt that the most ancient dinosaurs had primitive songs. Nor should we doubt that the songs of whales may be as complex as ours. So, we can accept the evidence of archeology and paleo-anthropology that indicates the critical importance of musicality to humanity and the evolution of music and esthetics. Again, music, song, and chanting preceded and enabled the evolution of all subsequent forms of linguistic transmission of knowledge and wisdom.

So, musicology and meta-musicology clearly belong to the other closely related sciences that enable development of more realistic, holistic ontology, holontology, interdisciplinary macro-ontology and meta-ontology. Without fully understanding the nature and power of musicality, fully understanding the nature of being (the cosmos), life, and reality would remain impossible. In that case, realistic psychology, anthropology, sociology, economics, and optimal quality of life would be impossible or retarded.

Serendipity: Like synergy and synchronicity, the principle and phenomena we call serendipity are enabled by creativity, a functional principle of being. The phenomenon is normally associated with luck, divine grace, and/or supernatural causes.

However, as shown in the meta-ontological definition of creativity, serendipity is possible only because the nature of being enables it. Of course, it implies and requires the existence of mentality, human beings, the principles of creativity and synergy, and the ensemble of natural metalogical principles that enable serendipity and our experiences of its expressions and embodiments. For example, since most of us are usually unaware of the seamless unity and interdependence of the energy and meta-energy enabling physical and mental phenomena, the results of unseen causes and effects seem amazing, mysterious, or miraculous.

Yet, realizing the nature and potency of being's enabling metalogical principles lets us understand the nonduality of universal and personal expressions and results of creativity. In fact, the vast majority of major scientific breakthroughs and great masterpieces of the fine arts are examples of serendipity, enabled by creativity and synergy, the universal principles.

Synergy: Dr. R. Buckminster Fuller realized that the nature and totality of universal being make the wholeness of a thing (or an event) greater than a sum of parts. He also realized that the nature of being always enables evolutionary creativity with a synthesis of integral dynamics and interactive processes. "Synergy" is what he called it.

Despite its essential reality, Fuller and his followers never looked for or discovered the natural metalogical principles that enable, empower, and sustain synergy and its results. Also—despite Dr. Fuller's discoveries, and increasing fame—synergy was not recognized as a primal principle of being until the beginning of this project. So, the powers, properties, and potentials of being's metalogical principles (its nature) were unrecognized, unrealized, and ignored.

The essay on “The Linguistic Problem” (p.?, Appendix B) reveals and explains the psychosocial biases and dynamics that prevented deeper, further discovery of the nature of being and reality. Fortunately, the results of this project enable further discovery and positive evolutionary development of science, maths, society, and civilization.

Synchronicity: Fuller realized that natural synergy enables events and results that may seem like coincidences, but are actually the results of complexes of causal factors. He called such phenomena the results of “synchronicity” (without defining, describing, or explaining it as a primal principle of being).

Clearly though, synchronicity is a subsidiary functional principle of being, enabled by a complex ensemble of metalogical principles, including mentality, physicality, activity, and the creativity of being (the universe). Knowing that synchronicity is a principle makes it easier to see that other, interdependent principles enable it, its causes, and its effects. Of course, that also lets us see ourselves as being more than simply physical, random accidents of a mindless, illogically mechanical cosmos.

In other words, events that express synchronicity show us that mentality and physicality are intrinsic to the nature of being (universal reality), and as interdependent and interactive as **a**) cause and affect, **b**) DNA-RNA and intelligence, **c**) mind and body, and **d**) living beings and their inner & outer biomes (and habitats).

Epiphany: It may not seem like a primal principle, yet having an epiphany is an event with a uniquely metalogical nature. Naturally, like other natural principles, the essence of an epiphany is nonphysical. We can think of it as a mystical or psychosocially derived experience enabled by the principles of mentality and humanity. Yet, the reality and essence of epiphany is naturally logical, not artificial or an accidental fluke of modern society.

The most common dictionaries’ definitions of epiphany are basically helpful, but not fully explanatory. Defining epiphany as a divine revelation or a sudden, surprising realization or intuitive insight is insufficient. For example, creative human beings—like Leonardo DaVinci, among others—can develop an evolutionary process that effectively cultivates epiphany as a more or less regular part of their lives. That possibility is enabled by unleashing curiosity, increasing openness, and regular use of our creative abilities, for exploration and discovery. Of course, that process is also enabled by synergy, synchronicity, serendipity, mentality, and the more primal metalogical principles that enable epiphanies and us.

For instance, this definitive explanation of epiphany, the principle, and the development of macro-ontology, meta-ontology, and bio-ethical axiology (etc.) were enabled by an evolutionary creative process that developed progressively during more than 70 years. So, understanding the principle of epiphany is clearly essential to the development of new and better theory and metatheory of science and society.

Mystery: The indigenous Lakota people think of and call supreme being “Wakan Tanka” (Great Mystery). Mystery, the principle, is important for realistic ontology because confusion about mystery—and what it is not—is pandemic. Mystery is a subsidiary principle that enables various conditional, psychosocially derived experiences.

For example, the actual initial state and original conditions of being (the universe) no longer exist and, hence, are beyond detecting and knowing. That makes the origin of universal being (the cosmos) and its earliest evolutionary processes of being truly unknowable mysteries. So, obviously, a real expression and/or embodiment of mystery is whatever is beyond detection and totally comprehensive observation, thus beyond completely comprehensive study, understanding, and explanation. In other words, superstitious beliefs, religious or pseudo-scientific opinions (about the unknowables of being), pop-science shibboleths, and other delusions—based on accidental and deliberate ignorance—are not examples of real mysteries.

Obviously, real progress in science and society requires good, generally accepted understanding of the difference between mystery and anomalies (artifacts of ignorant misperceptions and unscientific nonsense about realities beyond the scope of detectability and knowability). Therefore, realistic meta-ontology is critically essential for any real progress to a superior phase of science, society, and civilization.

Viability: Viability is the functional principle that enables ongoing being. The durability and sustainability of life, science, and society depend on viability, and its unique ensemble of enabling metalogical principles. Clearly, viability supports all natural structural principles (etc.), but also vitality, the key functional principle enabling life and us.

In fact, whether expressions of viability (and other enabling principles) are present or absent determines the difference between live and dead or nonliving things or entities.

Virtuality: One of the metalogical principles enabling and sustaining nonphysical phenomena is virtuality. For example, elemental principles, such as logic, mentality, personality, materiality, and physicality are virtual, nonphysical, yet actual elements of being. Thus, virtuality, the principle, exposes the absurdity of anti-logical materialism.

For example, consider data and metadata. They are not *in* or *beyond* semiotic symbols used for transmitting or computing with them, just as water is not *in* or *behind* ice. Similarly, mental or virtual phenomena and principles are not *in* or *over* or *beyond* any forms we normally think of as physical. Yet, thanks to the metalogical principles of form, structure, integrity, physicality, and dimensionality, we can use properties and qualities of dimensionality to think about the nature of reality. For example, we can think of various domains and properties of form as dimensions or spaces, though they are virtual mental constructs.

Hence, though they belong to a different order of being, we can understand all virtual expressions of nature's metalogical principles as pervading the field of being (and all other phenomena). Physicist David Bohm saw the universe as holonomic, having implicate and explicate orders of being, but missed seeing physical phenomena as embodiments and expressions of nonphysical principles (required for their being). Domains of meta-energetic and nœtic (cognitive or psychophysical) phenomena are virtual modes of being. Hence, holonomic theory and metatheory provide more descriptive and suggestive explanations than all the fantastic pronouncements about "dark" stuff and 'God' particles (causeless, accidental, virtually magical cosmic glue).

Bohm's holonomic hypothesis was inspiring, but incomplete, a promising yet

inadequate explanation of what modern science knew via technology of the 1970s. However, we all live, interact, talk, and think by virtue of nonphysical enabling metalogical principles, knowable as such. In other words, our theorems and equations are linguistic, semiotic expressions and results of the actual elements of nature, and its metalogical principles.

So, nobody will ever discover a subatomic particle that generates, empowers, and sustains awareness and the principles enabling, empowering, and sustaining universal phenomena. Clearly, looking for physical causes of nonphysical phenomena and principles that enable, empower, and sustain physical, psychophysical, and mental realities is an absurd exercise in futility.

Actuality: Actuality is a subsidiary principle and property of being enabled by the interactivity and potencies of form, structure, functionality, and relativity (the metalogical principles of nature).

Like energy and reality, actuality is enabled by activity and the other principles that enable all the expressions and embodiments of being. Clearly, relativity (and its nature) make actuality and reality mutually interdependent properties of each other. However, no matter how subtle the energy, activity is essential for and in all expressions and embodiments of actuality, but not necessarily for all realities.

For example, illusions and hallucinations are actual realities, but their “contents” are unreal. Also, while seemingly opposites, actuality and virtuality are complementary logical relatives.

Reality: Most of us seem to take “reality” for granted, except when thinking and acting as if it must be a matter of opinion. However, that notion is a prime motivator of corruption, institutionalized confusion, and normalized social delusion.

For example, for effective science and maths, a valid, unambivalent definition of reality is essential for proof of truth and untruth. Hence, if science and ontology are to progress to a superior, post-modern era of theory, metatheory, and praxis, disambiguation of “reality” is a nonoptional necessity. Consider maths, metamaths, QM, SM cosmology and physics in general. They all started stagnating as popularization of notional/personal reality was increasingly accepted and institutionalized as the new, post-theistic justification for ethical & anti-ethical, moral & immoral, and amoral ‘relativism’ (with decreasing interest in valid logical relativity and actual reality). The worst of it is QM cosmology, now based on illusion, conjecture, misconception, misinterpretation, and fantasy.

So, we now need an accurate, viable, holonomic definition and understanding of reality that supports transition to better science and society (and to survive the consequences of modern civilization’s deficiencies and atrocious excesses). Also, in general, what is real is whatever is truly expressive of the principles and actualities of universal being. Naturally, that requires valid, or at least optimal theory and metatheory of valid macro-ontology, and acceptance of the actualities of being. Still, acceptance is optional.

However, disputing and attempting disproof of the necessary sufficiency of good theory, its basis in actuality, and logical truth, makes realism’s opponents guilty of foolish self-negation. For example, the relativity of personal/conceptual ‘reality’ and pre-

existent cosmic reality can be falsified by disproving the validity of logic and actuality.

Yet, arguments against reality would invalidate the viability of mentality and being (a severely illogical fallacy).

Fantasy: The nature of being, relativity, and mentality enable the potential creation and enjoyment of fantasies. It may not seem to be an enabling principle of nature, yet fantasy was clearly a regular part of human life for more than 150,000 generations (3 million years or so). So, fantasy is clearly a principle and potential enabled by mentality, humanity, and society.

We see evidence of the early importance of fantasy in the symbolic art our ancient ancestors left on rock walls and in burials. Archeological proof supports the fact that those ancient images and figurines (etc.) expressed the elements of stories, myths, and belief systems partly enabled by fantasy. Clearly, unlike reality, fantasy is a potential of mentality enabling a) imaginary or illusory, purely psychological experiences and b) its sociocultural expressions, productions, superstitions, and rituals (etc.).

All those facts, and the current mass-obsession with it, make fantasy a critically influential part of human being and reality. For example, without a realistic assessment of the nature and power of fantasy—its uses, and effects (cultural, personal, and ecological)—the theories and metatheories of ontology, sociology, anthropology, psychology, and science in general would remain incomplete. That would mean that civilization's rapidly worsening crises could remain unresolvable and, possibly, terminal.

The most telling example is the ongoing mass-production and mass-consumption of products of fantasy—as if enjoying fantasies is more important than reality and optimum quality of life (etc.). So, confusion about fantasy, reality, quality, and the nature of being aggravates the decline and decay (corruption) of society and our habitat, the biosphere.

Sanity: The nature of being, relativity, and activity enable the potentials and phenomena of possibility, causality, mentality, and sentient beings. However, because of possibility and mentality, phenomena may be illusory or actual or virtual or a combination of those qualities. Sanity, a subsidiary principle of mentality, enables discernment and realization of the different qualities and properties of actual and illusory phenomena.

Sanity is enabled by mentality, rationality, intellectual integrity, responsibility, sensitivity, perceptual viability, cognitive validity, self-honesty, and appropriate action. Therefore, sanity enables psychophysical and psychosocial wellness. However, the nature of humanity permits both physiological and psychological deficiencies, defects, and illness. They may be caused by harmful, traumatic, and/or disruptive influences, conditions, or interactions (or a combination of causes).

For example, because of the interdependent interactivity of emotional and biochemical phenomena, sentient beings may suffer genetic and neurological defects, deficiencies, and changes that diminish their ability to discern the difference between realities and fantasies, delusions, illusions, hallucinations, and imaginary phenomena. That limits or prevents appropriate mental, physical, and social responses to stimuli (events, changes, challenges, dangers, deceptions, etc.).

Mathematician and Nobel laureate John Forbes Nash, Jr., provided a historically tragic example. Though gifted with rare genius, Nash was plagued by physiologically induced schizophrenia, hallucinations, and paranoid delusions. Sadly, for too long, that was not noticed by his academic colleagues. So, his major contribution to the maths of game theory, the Prisoners' Dilemma scenario (PDS), was partly inspired by and based upon Nash's delusional paranoia. Then—partly due to the mass-trauma and insanities of World War 2 (and the Nuclear Age)—Nash's game theory inspired the Cold War strategy of “détente” and social control.

Many years later, the schizoid fallacy of the PDS was realized and proven. Yet, it still maintains the competition for military, industrial, and sociopolitical dominance (at any cost, even ecocide). Therefore, the PDS proves that Nash was right about psychopathic leaders of military-industrial societies and the vast majority of their followers who maintain normalized mass-insanity.

Clearly, both sanity and insanity cause realities of human being and civilization. However, sanity enables recognizing and understanding the goodness and benefits of psychophysical and cultural wellness. Sanity also enables recognizing and understanding the causes of wellness and its benefits, and what limits or degrades or prevents them. So, being highly social primates, we naturally tend to favor wellness of mind, body, and culture. Still, bad habits and corrupting influences can subvert our natural preference for optimum wellness.

Thus, being such a mentally interactive species, our general quality of life is largely determined by the ratio of sanity to insanity maintained by our social norms, beliefs, habits, fears, hopes, and addictive tendencies. So, it is clearly good to understand and recognize the causes of mental and cultural wellness and illness. It is also important to remember that personal and cultural sanity and insanity can coexist (as in a range of degrees), alternate and transition, even from super-sanity to monstrosity.

We should also remember that there are 2 basic kinds of mental illness, **a**) neuro-genetic physiologically-induced dysfunctionalities, and **b**) culturally-induced normalized delusion, dysfunctionality, and neurolinguistic deficiencies. Unfortunately, the insanity of the dominant sociopolitical game and its socioeconomic system maintain all the conditions and biochemical factors causing more of both kinds of insanity. Now that the scale and impacts of monstrosity are so massive, eliminating or minimizing normalized delusions, erroneous beliefs, and deceptive rhetoric is a critical necessity, especially in the arenas of science, maths, media, and governance.

Lucidity: Lucidity is a functional principle and a property of sanity and mentality. Lucidity enables effectively functional **a**) awareness, **b**) cognition, **c**) understanding, and **d**) wisdom. Yet, our expression and experience of lucidity transcends the limits of rationality.

For instance, lucidity is more important for viable mental acuity and wisdom than rationality. Without being lucid, knowing anything about rationality, sanity, mentality, and physicality (etc.) would be impossible. Rationality can enable logical effectiveness, but not necessarily wisdom or creative effectiveness. For example, Albert Einstein considered his greatest realizations results of relentless curiosity and imagination.

Of course, lucidity, epiphany, serendipity, creativity, and synchronicity enabled all great breakthroughs in the arts and sciences, some of which were inspired by dreams.

Evidently, in the most ancient cultures and wisdom lineages, experiences during dreaming were considered as real and as important as those that occur while not asleep. In fact, lucid dreaming—being mentally awake while dreaming (while asleep)—was a talent enjoyed and employed by some of the most gifted shamans, spiritual leaders, and teachers of the great wisdom traditions.

Now, at the least, we can see the necessity of lucidity for optimal personal and cultural wellness, and for optimum scientific effectiveness. We should also bear in mind the danger of letting psychopathic (inhuman) rationality or excess emotionality suppress or repress lucidity. So, rationality, emotionality, and immaturity are inferior to wisdom because sustaining lucid awareness and unhindered responsiveness enable optimal results. Hence, since quality of life is important, adequate appreciation of lucidity is essential for optimal civilization, ontology, and science in general.

Maturity: No principle is more important for fostering and sustaining optimal quality of life for human beings and our habitat, Earth's biosphere. Obviously, maturity is a subsidiary principle of being (enabled by a complex ensemble of nature's metalogical principles).

Viroids are so biochemically primitive they show us little useful evidence of maturity. Yet, even unicellular beings exhibit properties of maturity, occurring just before mitosis (division into 2 new cells). One way or another, all complex living beings mature and reproduce sexually, but we are the most exceptional. Modern humanoids are not only biologically, physiologically composite beings, our psychophysical complexity enables several different modes and potentials of maturity.

For example, we have multiple domains and modes of biochemical, physiological, mental, emotional, cultural, and social interactivity. Of course, other social species are also blessed with such complex potentials of development and interaction. Yet, on Earth, only members of our species can develop any or all of those potentials to the degree and extent that we can. That is so mainly because of our mental and linguistic abilities. Yet, they were and are enabled by our infantile neoteny, the natural principle that made our humanoid potentials what they are.

Neoteny enables limiting our prenatal, physiological and instinctual (mental) development. So, unlike all other animals, we require far more care, nurturing, learning, and training after being born. Then, the effectiveness of our parenting, training, and socialization determines the rate and extent of our development toward maturity. Therefore, at best, humanoid embryos and infants develop in ecological, emotional, mental, cultural, and social environments that foster and support optimum multimodal maturity. Yet—when those environmental conditions and contributing factors are minimal—faculties, abilities, progress, and mastery of optimal knowledge, skills, and quality of life remain proportionally limited or undeveloped.

In other words, the extent and degrees of human maturity exist in a spectrum of complex possibilities and potentials. Prince Siddhartha Gautama set an unexcelled example of optimum human maturity. Yes, he was given the best possible environment and opportunities for becoming a super-skillful, super-successful king, warrior, strategist, and diplomat. Yet, trauma in infancy—his mother dying 8 days after giving birth—and an ultra-sheltered upbringing led instead to his becoming “the Buddha” (one of the greatest psychologists, philosophers, and spiritual leaders of all time). Of course,

the other originators of the world's great religions, some of our greatest artists, scientists, philosophers, and peacemakers were equally super-mature, or nearly so.

Historic examples of the other end of the spectrum need no mention here, and billions of us nearer the middle prove the point with regular foolishness and/or habitual mediocrity. Several decades ago, somebody realized a practical definition of personal maturity:

“Maturity is realizing your limits, and being able to work within them.”

That may seem overly simplistic. Yet, due to universal relativity, it holds true for any of us, of any capability or IQ, etc.). The prime prayer of Alcoholics Anonymous adds more depth and open-ended scope to the personal dimension:

“God grant me the power to change what I can change, the patience to accept what I cannot change, and the wisdom to know the difference.”

That makes perfect sense, despite personal opinions about God and the world. So, putting up with pandemic confusion about maturity — and its importance for attaining and sustaining optimum quality of life — is clearly a symptom of normalized mass-psychosis. A successful, acceptable, sustainable paradigm upgrade requires an optimum definition and understanding of maturity.

Hence, being the only Earthly species capable of practicing holistic ontology and studying the nature of being and humanity, studying and understanding the nature and examples of humanoid maturity (and the lack of it) are essential for optimum holontology (and for science in general).

Monstrosity: An ontology of civilization (and the meta-ontology of science and technology) would be incomplete without optimal definition, analysis, and critique of monstrosity, its modes, and its effects.

A well-known, updated definition and general understanding of monstrosity may not eliminate it, but may help to minimize it. That should seem important for real progress of science and civil society, because modern monstrosity is pandemic, chronic, and mostly systematic. Also because morality and moralism could never prevent or stop either atrocity or monstrosity. Yet, like morality, monstrosity (the principle) could never exist without atrocity and humanity.

Atrocity is bad enough, but monstrosity extends and expands it to the limit. For example, though mass-atrocity and horrific monstrosity existed prior to 1177 BCE, increasingly large populations, urbanization, and increasing systemization led to increasingly systemic corruption, social decay, an increasingly systematic monstrosity. Of course, the process required increasingly traumatized, demoralized, desensitized, and confused, often terrorized populations. In other words, from the first civilization or earlier, they tended to become increasingly anti-ethical, authoritarian, monstrous, self-destructive and worse.

Though some outstanding examples of earlier civilizations prove that sustainably egalitarian societies can last for centuries or millennia, even the ancient Greek and more modern experiments with democratic government prove them all exceptions to the monstrous trend. Obviously, despite political and commercial rhetoric, massive poisoning and systematic destruction of habitats and species keep accelerating despite wishful thinking, mass-protests, and promises of seemingly honest politicians.

The global war industry, wars, global crime cartels, the prison industry, big Agribiz,

big Pharma, the atrocities maintained by the for-profit illness care industry—and the parasitic debt-for-profit national currency system—provide more recognizable proof of mass-monstrosity. A more extensive analysis is provided by a recent paper, *Trump, Hitler, Freud, and Monstrosity*, a preprint draft in progress. (Mon, 2019)* The books by Dr. Anne W. Schaefer (*When Society Becomes an Addict*, among others) enable a much better perspective on the nature of mass-monstrosity.

* See the entry in Section 6, “BIBLIOGRAPHY”

Absurdity: Whatever is foolishly illogical, irrational, dysfunctional, and/or abnormally silly is an expression of the principle of absurdity. It is enabled by mentality, humanity, society, and stupidity but, normally, as a property and symptom of a) cultural and/or sociopolitical decline and decay, or else b) as a form of social criticism or protest (often as semi-humorous satires and parodies).

For example, the absurdity of civilization’s psychopathic socioeconomic psychodynamics—and the mounting consequences—can be likened to elitist upper-class passengers playing musical deck chairs on the HMS Titanic, while the lower-class passengers are locked into the lower decks. Of course, the great novels, short stories, plays, films, and TV series using and critiquing societies’ normalized absurdity are too numerous and well-known to list here. Yet, the histories, plays, and literature of ancient Asia and Greece prove that chronic absurdity is cyclical, increasingly pandemic and, potentially, terminal.

Great examples of nearly worst-case absurdity are expressed in the works of Franz Kafka and Mike Judge, the creator and director of *Idiocracy* (the film), and other, less alarming works of satire and social critique. In fact, somewhat like Aldous Huxley (author of *Brave New World*, and *Brave New World Revisited*), but with more sardonic humor, Mr. Judge predicted probable consequences of modern absurdity. That led to fans adding satiric taglines to images of the *Idiocracy* PR posters. The following is a characteristic example:

““The only movie that started out as a comedy now turning into a documentary.””

A more recent critique of systemic absurdity is the film *Don’t Look Up*, with an all-star cast, directed and produced by Adam McKay. For example, though the film’s horrific theme, main motif, and prime plot device is a giant, planet-killer comet heading for Earth, fast, the producers (including lead male actor Leonardo DiCaprio) made it public that the film is an allegory depicting the absurd mass-insanity prolonging and aggravating extreme climate change, polar meltdown, and systematized monstrosity. So, obviously, realistic ontology and sanity require serious study of normalized absurdity and institutional-stupidity (and appropriate action).

Beauty: Beauty is a principle of form enabled by relativity, mentality, and humanity, and all their enabling principles. So, more than 2600 years ago, Lao-Zi, the author of *Dao De Jing* (*Tao Te Ching*) emphasized the fact that seeing something or someone beautiful makes other things or beings ugly or mediocre, at best. Now, that is still true, because the functionality of the metalogical principle of relativity is constantly reliable.

Despite those truths, misunderstanding and confusion about beauty can and have caused or aggravated historic problems, malignant jealousy, systemic corruption,

horrific crimes, and social decay. For example, although the legendary Helen of Troy was probably not the real reason for the Greek war against the Trojans, it seems likely that beauty, envy, and jealousy make the excuse seem more glamorous and glorious. Yet, starting a genocidal war and launching a thousand ships for just one pretty face or one man's vanity seems extremely unlikely. However, from 1177 BCE (if not earlier), envying and desiring the beautiful things an ultra-wealthy kingdom could afford was a fairly common cause of all-out war.

Dao De Jing also warns against accumulating and/or wearing lovely and precious possessions that can inspire envy, jealousy, and theft or worse. Of course, all the ancient religious traditions mention or imply the troublesome fear of losing many beautiful things acquired at great expense and/or with great effort. World literature and ancient legends also include examples of how superficial, socially-induced conceptions and standards of "beauty" can mask and enforce exploitive social control strategies, systemic corruption, and pandemic self-delusion. Thus, we still respect the old sayings, "there is no accounting for taste" and "beauty is in the eye of the holder."

Still, it may seem ironic that anyone would realize that what we see as beautiful always contains an element of the grotesque, the ugly. Yet, relativity constantly enforces the integral, virtual and/or physical relationship of complementary opposites. However, in human realms, the perception and psychological effect of experiencing a beautiful thing or being may not make any defects or ugliness apparent. The intrinsic relativity may also manifest as opposites of physicality and mentality or personality. So, a person or thing may look beautiful externally, but not internally.

In maths and the sciences, an equation or theorem may seem elegantly beautiful, but have unintended consequences that enable ruin or destruction of great beauty and horrify the theorist. Einstein's equations and the horrors of the nuclear age are atrocious examples of that dichotomy. An equally atrocious example is the millions or billions of people seeing weapons and military regalia as beautiful. Unfortunately, architecture, engineering, and industry have produced beautiful things throughout world history, but most of those things have caused and are still causing ever greater ruin, poisoning, and destruction of species, habitats, and earth's biosphere.

Therefore, it should seem self-evident that a good, generally shared understanding of the relativity of beauty is critically important for real progress of science and society.

Stupidity: In a universe of all possibilities, naturally, mistakes exist, some of them foolish mistakes. Low intelligence and ignorance are often thought of as stupidity, but it is a principle, not the opposite of high intelligence. The principle of stupidity is the relative opposite of high sanity, AKA wisdom.

For example, a highly intelligent person may lack sufficient experience or maturity to attain and sustain wisdom sufficient for optimum activity and responsiveness. So, a highly intelligent child may suffer arrested development—from inadequate or traumatic socialization, or a neurological cause—then suffer from inappropriate choices, actions, and consequences. Hence, avoiding inferior quality of life requires sufficient wisdom. So, people who are smart and highly educated can choose not to make the most of dangerous situations, to the best of their potential ability. Therefore, when they lack or reject a) wisdom, b) optimal options, and c) superior possibilities, highly intelligent individuals, groups, and societies can make the worst, most foolish mistakes.

Clearly, under-estimating the potential of stupidity is an extremely serious mistake. The ills, crises, disasters, and atrocities of modern civilization prove and verify this definition and the enabling ontological metatheory.

Identity: Identity is a primal metalogical principle of being, intrinsic to the nature of the universe. The existence of intelligence, knowledge, and consciousness imply and confirm the existence of identity. However, the nature of identity seems generally unknown, often deeply problematic, potentially catastrophic.

Naturally, the nature of identity is essentially determined by other enabling principles, for example, individuality. Obviously, there are personal and impersonal kinds of identity. For example, an entity may be a form or object without any personal qualities, thus no sentient identity. Yet, the existence of any kind of identity requires and involves the enabling principles listed below:

- Actuality, physicality, mentality, reality, and presence
- Form, structure, functionality, relativity, activity, and energy
- Individuality/singularity, integrity, unity, duality, and multiplicity
- Primality, reciprocity, regularity, immutability, and mutability

Personality: It, the principle, is enabled by the ensemble of metalogical principles of being that give personality its properties and qualities. So, it enables personhood, personal identity, but egos and animals do not have personalities. Being confused about that seems pandemic and endemic in modern societies.

However, Buddhism proves that the nature of the problem is ancient. It is also clearly nontrivial. Common confusions about personality, ego, self, and realities are common causes of misunderstanding, conflict, and war. For example, misunderstanding the nature of personhood also causes inappropriate ideas, opinions, and attitudes that cause or aggravate fear-based emotional reactions, foolish actions, and unfortunate consequences.

In fact, as Buddha realized, confusion about selfhood maintains confusion about the world, reality in general, and the causes of suffering. Of course, that problem prevents or limits our ability to generate and sustain the causes of wellness, joyful contentment, serenity, and harmonious interactions. Sadly, excessive enmity, hostility, and violence—of and between individuals, families, genders, religions, nations, species, and other groups—confirm Buddha's diagnosis of civilization's chronic illness.

Obviously, the most severe symptoms occur in societies afflicted by pervasively pandemic authoritarian personality disorder combined with malignant narcissistic personality disorder of megalomaniacs, like Mussolini, Hitler, Stalin, and too many others to list here. So, definition of the principle of personality is essential for optimum ontology, psychology, and society (etc.).

Individuality: Individuality, like personality, is a commonly unrecognized principle of being. Individuality is an aspect and interdependent expression of identity, singularity, integrity, and relativity. The universe is the primal embodiment of individuality, expressed in and as the unity of its wholeness. Each principle, each idea or thought, each symbol, every elemental form and function of being (every molecule, compound, cell, organ, and body in the universe) embodies and enacts individuality.

Without the intrinsic metalogical principle of individuality, there could be no identity or unity, nor relativity and complexity, and no diversity. Logical, virtual, and actual individuality can be finite, definite, and infinite. For example, the actual individuality of phenomena and forms of being can be as transfinite as any infinite set of unique totalities.

So, macro-ontology, meta-ontology, and holonomic metamaths affirm individuality as a primal enabling principle of form.

Multiplicity: It enables the existence of more than one thing, place, and being, multiple identities, quantities, qualities, and properties. Metalogical principles of being enable multiplicity, a subsidiary principle of form.

Multiplicity also enables totality, numbers, multiplication, productive replication, and procreation. Therefore, understanding the principle of multiplicity is as important for optimal number theory and metamaths as it is for good physics, biology, and ecology. Obviously, an optimum definition and effective use of the term is necessary for sufficiently definitive theory and metatheory macro-ontology and meta-ontology.

Possibility: Like reality and actuality, possibility is a subsidiary metalogical principle enabling the presence and actualizable potentials of **a)** being, **b)** beings, **c)** non-illusory things, **d)** events, **e)** their properties, and **f)** processes that really exist.

Possibility enables causality and the other principles required for actuality, reality, being, and sanity. However, naturally, possibility also enables the realities we call illusion, delusion, and imagination, among other potentials of being. Clearly, realities are possible and possibilities can be realities. Of course, possibilities and impossibilities may seem to be potentially real, but never become actual realities of being.

So, understanding the difference between possibility, potential, and impossibility enables good science, maths, valid proof, and optimum explanation of realities.

Potentiality: Like ability, the principle of potentiality enables what can or may come to exist, at least in principle. Unlike possibility and causality, potentiality does not always enable and sustain what can or may come to exist in reality. So, like probabilities, potentials are not always actualized realities.

However, potentiality and possibility enable potency, power, probability, and our ability to realize the evolutionary potentials of mentality and being. (see def., Power)

Probability: It, the principle, is a subsidiary principle enabled by potentiality and possibility, but does not enable reality.

The possibilities of reality do not require probability, but the metalogical principles of reality enable and sustain it. So, probabilities may be potentials, but they never equal realities.

Thus, concepts, theorems, equations, maps, graphs, and models—based on approximations, calculation, and probabilistic statistics—and the realities they symbolically refer to are neither actually equivalent nor logically identical. Misunderstanding or ignoring of that fact maintains deficiencies and crises in science (especially physics), maths, metamaths, and society.

Intentionality: Intentionality is clearly a principle, property, and element of the

ensembles of metalogical principles that enable identity, mentality, and being (etc.). So, even in the most primitive modes of transactive being—from prions, virions, viroids, RNA, mitochondria, bacteria, and our own cells on up—we find evidence and proof of intention or proactive purposiveness, at the least.

Of course, since human beings are embodied expressions of being (and its nature), we are living proof that intentionality and intentional interaction are enabled, sustained, and empowered by nature's elemental principles. Indeed, if that were not so, there could be no adaptive (or maladaptive) development enabling the evolution (and devolution) of human societies, cultures, arts, sciences, and technologies. Clearly, the good, bad, and ugliest results of intentions are enabled by the natural principles required.

The potentials of Intention are tightly intertwined with the needs, desires, and interactions of all beings, with each other, and with their inner and outer biomes, or habitats. That makes intentionality a key element of the habits of living beings, for better and worse.

For example—because of causality and psychodynamics—intentions, attitude, and emotions drive simultaneous neurochemistry. So, even in the arenas of science, maths, and STEM education, not realizing the critical importance of intentionality (and the power of habit) enables and supports ineffective analysis, policy, strategy, and actions. Of course, the worst examples we see in government, politics, corporate finance, big industry, and war, affecting every other realm and level of society.

Thus, for realistic ontology and good science in general, considering the nature and effects of intentionality is essentially important. That is especially true in the arenas of theory, metatheory, critical analysis, R&D, and educational policy.

Effectivity: Activity, causality, and effectivity are prime functional principles enabling energy, interactions, causes, and effects. In human life, effectivity also enables effectiveness and efficiency. Obviously, a deficiency of effectiveness prevents optimum **a)** thought, **b)** understanding, **c)** communication, **d)** interaction, **e)** science, **f)** theory, **g)** maths, **h)** proofs, and **i)** civilization, among other deficiencies. So, effectivity is an essential enabling principle of being that enables quality and its physical and virtual expressions or embodiments. In fact, like power, effectivity enables the potency and effectiveness of the nonphysical principles enabling physicality, being, life, and sensory perceptions of energetic phenomena (matter, forces, etc.).

Mutability: Like activity and motility, mutability is a subsidiary principle of functionality, the primal metalogical principle enabling it (*i.e.*, transformability). Obviously, mutability enables and sustains the evolutionary changes caused by activity and actual interactions. Fortunately, as is the case for other functional principles of being, mutability's nature is immutable.

So, because activity and energy are intrinsic to physical actuality—unless a process, function, operation, or event is enabled by an ensemble of principles that enable immutable virtuality—change and transformation continue. In other words, the principles and potentials of being cause and sustain the constant transformation and reorganization of all its physical and energetic phenomena.

Entropy: Entropy and negentropy are nonphysical principles of being and its nature

(the metalogical principles that enable everything else). Because physicality is enabled and sustained by causality, activity, and mutability (etc.), energetic events express the properties and potentials of entropy and negentropy. Like all other functional principles, entropy and negentropy are enabled and sustained by ensembles of natural principles, including regularity, normality, and actuality (etc.).

The reality and potentials of entropy are determined by its enabling and sustaining principles. The actualities and potentials of negentropy are also enabled by immutable principles of being. Thus, nature's balance of energetic transformation, flow, and momentary presence is sustained by its intrinsic metalogical integrity.

Clearly, entropy and negentropy are not simply accidents of chaos and causeless physical processes. They are subsidiary principles of being's metalogical functional principles. Hence, we can admit that Newton left half of energy's reality out of his theorem of thermodynamics (etc.). The best proof of that is visible in the interaction of plasmas and the hyper-plasma regimes in and around all galaxies, nebulae, stars, and the ultra-colossal currents of energy in which they move (and spin).

So, instead of believing that the cosmos is running out of energy and order (while infinitely expanding beyond possibility), we can see galaxies, stars, and vast currents of energy showing us ultra-colossal circuits—some spanning many billions of lightyears (LY) across the detectable “field” of being. Hence, that lets us understand galaxies, stars, and cosmic energy currents as nature's recycling centers and high-voltage conveyors of luminal and hyper-luminal energy. In other words, there will never be a shortage of energy or structure, nor of how they could be.

Being's cosmic energy budget is always balanced by transformational, multi-modal exchange, and increasing complexity. Forms and modes of energy (and effects) are always exchanged between the various modes and regimes of luminal (and subluminal) and hyper-luminal energy that enable and sustain every mode of physical form (matter, etc.).

Reciprocity: Reciprocity is a functional principle inherent in all phenomena, however subtle or meta-energetic. Relativity and functionality enable reciprocity and the relationship of all relationships, AKA the cosmos, or being. So, actual reciprocity requires energy or its essence, activity, the principle (and its meta-energy).

The reciprocity of relativity and identity, and of physicality and mentality (the principles) enable our understanding of reciprocity and its expressions. Clearly, intellect would be impossible without the reciprocity of perception and cognition, enabling and enabled by reciprocal awareness and appearance. All relationships, whether elemental, biological or mathematical would be impossible without reciprocity.

The principles of unity, primality, duality, relativity, symmetry, integrity, activity, and functionality enable reciprocity and everything else. So, because of causality and primal (original) reciprocity, all things and beings are subject to the functional principles that sustain interdependent interactivity (cause & effect). From the level of basic meta-logic and elemental physical phenomena to the astrophysical and psychosocial fields of being, reciprocity ensures that the constancy of interdependent interaction sustains the evolutionary creativity and reciprocal potential of universal being and its nature.

Thus, the properties and usefulness of mathematical reciprocals are no accidental

invention of mathematicians. The reciprocal relationships of the reciprocals to their denominators—and of the sequences and patterns of all the primal and nonprimal numbers in the serial progression of the whole numbers—are enabled and sustained by relativity and integrity (etc.). Hence, original reciprocity and duality are inherent to all mathematical progressions and functions, shown by all sums and zeros of Riemann's Zeta function and formula (\Re_z) and by the enabling reciprocity of $\frac{1}{2}$ and -2 . That is true because numbers, complex terms, polynomials, algebraic equations, geometrical relations, and trigonometric functions require reciprocity, and reciprocality, the natural metalogical principle enabling it.

Electricity: Reciprocality (among other things) enables the “electricity” we normally take for granted—as an independently real thing or mysterious force of nature. So, it can now be understood as a functional principle that enables the mode of energy (and effects) we call electricity.

For example, the nature of the “field” of being's cosmic energy makes it magneto-dielectric, not electro-magnetic. Electro-magnetic force is an effect of energy's magneto-dielectric properties. That redefining distinction may seem too trivial. Yet, without better definition of energetic interaction, the crises of modern science will keep festering.

Otherwise, gaining and sustaining a real understanding of being and science requires rethinking the nature and reality of energy. For example, the nature of energy is its enabling, sustaining, and empowering principles. They determine the possible forms, modes, and effects of energy. So what was called electricity is one of the modes and effects of energy. Yet, labeling it and thinking of it as an independent phenomena or force was confusing and totally unrealistic.

In fact, all kinds of force are effects of energy and its modes of being and doing what they do. For instance, because primal relativity makes its electric and magnetic properties interdependent functions of each other, they enable the effects of all energy's inseparable modes. So, the so-called “weak” and “strong” elemental forces, the force called “gravity” and the “electro-magnetic” forces (EMF) are already united by the nature of energy, its empowering metalogical principles. The only thing that makes those modes and effects of energy seem mysteriously different is confusion, immature theory, and chronic illogic.

Consider the self-evident integrity of energy's modes and effects at the elemental scale. Allegedly, probable particles (of QM maths) are good representations of the realities. Yet, seemingly, both EMF and kinetic forces, KF (angular momentum, etc.), enable the energy and motions that make all the interactions and potentials of matter and chemistry possible.

So, clearly, the interactive union of EMF and KF properties and effects are enabling and sustaining the morphological, structural, and functional modes and dynamics of the elemental forms of energy. Of course, that enables macro-scale fluid mechanics and the realities enabling electrical engineering, plasma phenomena, galaxies, and cosmic currents carrying them (etc.). Thus, we also see the interdependence of EMF and KF in orbital mechanics, solar systems, and satellites (etc.). Likewise, the nature of energy enables seeing the effect called gravity as a side-effect of the interactions of EMF and KF effects. For example, gravity (G) is actually well-defined as acceleration, not attraction. Now, it is clear that the universal “field” of energy and its forces are omnipresent, all-

pervasive, and reliable.

So, attraction to “centers of mass” could only exist relative to repulsion or expulsion from beyond. In the unified field of real energy the ‘pull’ of a force can only exist with an equal push from the other side. Thus, thanks to the laws of cause+effect and mechanics (action+reaction, etc.), ‘quantum gravity’ and magic particles (with uncaused supernatural powers) were never necessary.

Yet, we could look at gravity from a disintegrative perspective and want a description of the evidence in terms of EMF only, ignoring the KF involved. Still, because modes of energy are interchangeable, we can do that without breaking any ‘laws’ of physics. So, the effect we call G can be related to the phenomena labelled as the Lorentz, Lenz, and Hall effects, or simply described in terms of lossy dissipation due to complex interactions of interpenetrating “fields” of energy. That would still be silly though, because there is no way to separate EMF and KF and their interdependent effects.

A better way to understand the dynamic interdependence of energy’s EMF and KF modes is by seeing them in action in the heliosphere and beyond. Naturally, it helps to think in terms of fluid mechanics, and forget about hypothetical particles. Now, astronomers and astrophysicists recently found that plasmas streaming “out” of the sun keep accelerating, not losing energy and slowing down. That happens because of the magneto-dielectric nature of the field of energy and its luminal and hyper-luminal subfields.

Yet, the hyper-luminal subfield has dielectric properties (among others), meaning that it can act as an insulator or transistor. So, like the ultra-colossal currents carrying super-clusters of galaxy clusters—across billions of light-years (LY) at 1000s of kilometers per second—the sun is in a mostly resonant cosmic circuit. However, clearly, if the sun is like a cathode, then rest of the galactic subfield is the anode, which is what was discovered at the heliopause (the boundary of the Sun’s electromagnetic system).

We can also see a small analog of that in ornamental high-voltage plasma globe lamps. Naturally, the realities pose a problem for QM cosmetologists (finding it ever harder to cover up their blemishes & deficiencies). For, if the field is only an empty vacuum made of ‘dark’ mystery stuff and/or undefined ‘electronic fluid’ (or gelatinous QM foam)—without any electrical or magnetic properties—then why did they find the cosmos doing what it does (and always did)?

In other words, since there are EMF and KF effects in the allegedly inert, empty field of extraterrestrial and extrasolar space, then QM cosmology, physics, and astronomy need a major upgrade, from the unfinished foundation up. Obviously, it helps to rethink the antique ideas and terms of the pioneer electricians.

For example, instead of taking the labels “dielectric” and “static electricity” for granted, we can deconstruct them and unpack their real significance. We can do that because the pioneers were very intuitive and insightful. However, thinking that are 2 kinds of ‘electricity’ was due to incomplete understanding, due to not understanding either the nature of energy I or being’s enabling metalogical principles. Of course, it can seem that there are 2 different kinds of electrical force, but we now know the reason.

In the absence of motion (and KF dynamics), the energy of a form of matter is busy doing whatever it does. Then, the dielectric mode of the E field (E_F) and its local subfields (of matter, etc.) remain in dynamic balance, relative harmony. Yet, “permanent

magnets” show us that the dielectric mode of the E_F is as magnetic as its active modes.

So, recalling that the magnetic and electric modes of E are inseparably interdependent, we can see the magnetic properties of the E_F as the unifying enabler of its modes of interactivity. Hence, calling the E_F a magneto-dielectric field of energy ($E_{MDF\infty}$) is more realistic and more useful. It lets us de-confuse the issues and untangle the maths and rhetoric of QM physics (etc.).

Thus, we can now understand the $E_{MDF\infty}$ having 2 modes of EM_F , **a**) its relatively stable (not static), internal or latent mode of activity, and **b**) its more externally interactive mode of flow and generative change.

The local EM_F effects of E in the $E_{MDF\infty}$ of being are caused by and depend on the changing levels and intensities of E as subfields change, move, and interact. The scale of form is irrelevant. The nature of the effects never changes, because the nonphysical nature of the $E_{MDF\infty}$ can never change. Remember, physical causes and effects have no way to affect nonphysical phenomena (especially nature’s constantly reliable principles that enable physical events).

Integrity: Integrity, the structural principle, enables and sustains primal unity and identity, the unique individuality of each entity and thing, and of the universe. The expression or embodiment of integrity depends on other metalogical principles, mainly actuality, reality, identity, form, structure, functionality, relativity, reciprocity, regularity, and permanence.

Obviously, beings, forms, structures, functions, and systems would be unsustainable without integrity. The formal, structural, and functional logic of maths, its results and proofs would be impossible without integrity. In fact, without integrity, there could be no logical principle of permanence to ensure that viable functions and formulas that work with integers also work with complex numbers in analytic algebraic geometry.

The constant nature and properties of numbers, equations, formulas, algorithms, and graphs all depend on integrity that sustains the principles governing them and their potentials. For example, the logical integrity of arithmetic is an expression of the natural integrity of the metalogical principles of being itself. Integrity enables the primality, relativity, and identities of 1, 2, 3, and all the other primal numbers. Integrity also enables and sustains the complementary relativity of simplicity, complexity, symmetry, and asymmetry (seen in the relationship of primal and nonprimal numbers).

Integrity enables and sustains the interdependence of all phenomena and potentials, including truth, falsehood, reality, and unreality. So, truth, reality, and proof are characterized by integrity. Unreality and untruth lack the logical and actual integrity of natural congruency. Logical integrity ensures the reliability of the nature of maths and the nature of life, making it a fundamental essential of science and proof. That makes integrity an essentially important element of theory and metatheory of macro-ontology and meta-ontology.

Fractality: The enabling principle of self-similarity, fractality, is enabled by nature’s metalogical principles of form and structure. Yet, unlike its expression with geometry and graphics, nature clearly prefers quasi-fractality and approximal similarity.

For example, unlike geometric progressions and numeric sequences of abstract maths, embodiments and expressions of nature’s metalogical geometry usually enable

and sustain dynamic change and growth. We can say proof of that in the apparently imperfect forms of many crystals, seashells, plants, galaxies, and the approximate morphological similarities of solar systems and atomic elements. However, as shown in images supporting the proofs and meta-proofs of macro-ontology, the geometries of carbon (and many of its allotropes) and DNA (and many carbohydrates, etc.) are enabled by the same metalogical principles that enable maths and numbers. Likewise, though the various forms, configurations, and functions of the energetic elements are not substantially solid, they share some structural and functional dynamics that enable galaxies, solar systems, and weather.

So, some similarities are apparent. Yet, similarity does not equal identical form, structure, functionality, and actuality. Hence, although relativity, integrity, regularity, and normality (etc.) enable fractality and similarity, they cannot override the unique individuality and structural integrity of identities.

Symmetricality: Symmetry and asymmetry are enabled by symmetricality, the principle. They are also nondual aspects of form, structure, relativity, unity, integrity, individuality, and reciprocity. So, the symmetricality of a pattern or a thing or group of things is perceivable and/or knowable only in relation to what is asymmetrical.

That relationship can be seen in all forms of life at all levels, from the cosmic to the mineral, vegetal, animal, to the cellular, the viral, viroid, DNA-RNA and sub-molecular scale. Every kind of, brain, body, and species would be impossible without the intrinsic symmetry and asymmetry of nature's metalogical principles. As primal expressions—of form, structure, relativity, and reciprocity—symmetry and asymmetry can be seen in the numeric structure and sequences of all primal numbers (primes) and their reciprocals.

The relationship of primals and composites in a series or field of whole numbers is a prime example of asymmetry existing in relation to symmetry. Numeric inequalities are expressions of asymmetry's logical inequality with symmetry. The intrinsic symmetries and asymmetries of numbers and other phenomena are non-optional (nor accidental or fictional), nor simply inventions of mathematicians.

Equations are mathematical examples of logical symmetry expressed with equality, but asymmetrical expressions and values may be on just 1 or both sides (of "="). As with singularity and duality, or individuality and multiplicity, the principle of symmetry exists only in dyadic relativity with asymmetry, its logical opposite.

For example, the nature of the rational expression for 1 divided by 2, can represent unity divided by duality, and the relativity of logical asymmetry (2 and 1 or $\frac{1}{2}$). So, if an image or object expresses dyadic symmetry, one half is a mirror image reflection of the other. In Riemann's famous graph (of \Re_{ζ}), "the line of symmetry" ($x = \frac{1}{2}$) reflects the symmetry of the 2 sides ($-$ and $+$) that meet at zero ($x = 0$).

Obviously, the logic, maths, and enabling metalogical principles make it impossible for Riemann's zeta function not to generate zeroes only on the lines at $\frac{1}{2}$ and $-2n$. So, \Re_{ζ} also expresses the asymmetry of negative duality divided by the primal symmetry of positive unity and totality.

Equality: Without the principle of equality there would be no equations, no arithmetic, no logical equality of 0, 1, and 2 (as natural whole integers and members of the primitive triad). The equality of the maths of continuous and discreet phenomena is revealed by

the zeroes on the line of symmetry (at $\frac{1}{2}$) in graphs of \Re_z (Riemann's Zeta function). In fact, the equality of $\frac{1}{2}$ and -2 (confirmed by \Re_z) and the nature of 1 and 2, also confirm the primal relativity and logical equality of 1 and 0, as virtual realities and their symbols.

Clearly, equality, identity, unity, and integrity are interdependent, relative functions of each other. So, the principles of primal intelligence and macroscopic phenomena are logically equal constituents of cosmic totality. Some may dispute that, but the reality of being is all equally necessary things, beings, events, and processes. Thus, despite assumptions, opinions, judgements, prejudices, preferences, and aversions, the basic logical value of an element, a principle, a system, a number (or some other symbol) equals all others.

For example, as numerical symbols, as concepts, and as elements of mathematical logic, the primal (prime), odd, and even numbers have equal importance. Also, interdependence makes each relative element of a logical or metalogical couplet equally absolute.

Regularity: Buddha was right about transient things being impermanent. Yet, the morphic, structural, and functional properties of regularity, the principle, enable the results of arithmetic progressions, even in the exotic domains of complex algebraic geometry, post-Riemannian topology, and QM maths. Governing principles of numeric and mathematical logic (and rules)—enabled by metalogical principles of being, form, structure, function, and relativity—rule mathematical functions, operations, and semiotics. Thus, using any kind of maths properly never causes dysfunctional irregularities. That regularity is a metalogical principle of being is proven by an ever-increasing number of studies of physical, geological, biological, and statistical evidence.

That truth is shown by and known as the Newcomb-Benford curve (or first digit rule) or, now, as the natural distribution rule (**NDR**). Clearly, nature and regularity support logical and mathematical principle of permanence, and all other enabling principles of being. So, regularity enables viability, reliability, and certainty.

Hence, there is no reason to believe that Riemann's zeta function will ever cause any results other than what it has caused between 1859 and the present moment. That truth supports the importance of regularity as an essential element of holonomic metatheory (of science, maths, logic, and proof).

Normality: Like regularity and integrity, normality (the principle) enables reliably persistent qualities of impermanent, transient physical things and beings, at least temporarily.

Normality is another metalogical support for the reliability and functionality of maths and science. Obviously, without normality, integrity, and regularity we could have no reason for trusting either maths or theory. In fact, there would be no reliably functional principles to enable anything but a limitless chaos of total transience or formlessness. Hence, even chaos and formlessness would be as impossible as a mind to consider the concepts.

Unfortunately, the principle is often misunderstood, and what a majority may consider normal maybe a state of mass-delusion or normalized confusion, at best. Current events, world history, and common uses and abuses of language provide abundant proof of that theorem. So, understanding and recognizing the difference

between logical normality and normal psychosocial notions is essential for good theory, viable metatheory, and valid proofs.

For example, the principle of normality exists in relativity with its logical opposites, irregularity, perversity, abnormality (etc.). So, we can use and consider the expressions, properties, and potentials of normality to evaluate the nature and qualities of realities, eccentricities, exceptions, truths, theories, proofs, illusions, lies, and illogic (etc.). That makes normality important for good ontology and science in general.

Primality: Primality is a metalogical principle of form and structure, not simply a concept or invention of mathematicians. Primality is intrinsic to being and nature's original metalogic. Primality is intrinsic to identity, and an expression and property of unique individuality.

Mathematical and numeric primality is an expression of original primality. For example, original unity and universal being are *a priori* (pre-existing) expressions and embodiments of metalogical primality. Numeric primality reflects the primality intrinsic to all phenomena in each unique state of the whole, and each subsidiary identity. So, it is intrinsic to every embodiment of originality, the most primal is the universe itself. Thus, 1 is the primary, logical numeric symbol of primal priority.

Remember, primality, causality, and creativity are interdependent principles that enable each new state of being's presence and intelligence. All other principles, properties, and expressions of being, form, structure, function, and operation exist in interdependent relationship with identity and its primality.

So, the primacy of natural meta-logic is primary and prior to all other expressions of primality. The unity and integrity of being are infinitely pervasive in each new moment of presence, making primality intrinsic to all things, beings, and moments that express it to any degree.

Priority: Priority is a principle, property, and subordinate expression of originality, primality, and relativity. Priority is also a property of ordinality, and a reciprocal opposite of posteriority and triviality.

Priority is enabled by form, structure, functionality, mentality, actuality, causality, validity, reality, identity, integrity, reciprocity, and regularity. Without priority, primacy, numeracy, counting, initiation, succession, progression, maths, metamaths, measurement, analysis, evaluation, organization, and effective communication would be impossible.

For example, discovering and verifying *a priori* (pre-existent, prerequisite) principles and facts of nature enables development of better theory, metatheory, and science. Therefore, priority is fundamentally essential to proof and holonomic metatheory. Hence, the axiological and metalogical actuality and superiority of theory and metatheory proven valid, enables and supports qualitative priority over obsolete theory proven invalid or inadequate. Despite that, misunderstanding priority enables and tends to maintain inferior theories, paradigms, and opinions.

Unity: In maths, there may be an infinity of roots of unity, but only 1 taproot of infinity, integrity (the primal enabling principle). Physically or virtually, unity requires, expresses, and embodies the primal integrity and harmony of components, elements, or

constituents of a whole thing (being, the cosmos, etc.).

A single unit of some kind is called a unit because it is 1 embodiment or expression of unity, an undivided wholeness. Unity is also realized as the presence of a dyadic, triadic, primal, or composite phenomenon, a thing or concept, an entity or identity, or the whole universe. As a metalogical principle, unity enables a state of oneness, of being at one or conjoined as one with another or with all things.

So, the universe is the original embodiment and expression of unity, and that confirms the integral presence of its original metalogical principles. The interdependent relativity of identity and infinity sustains unity, as in the definite identity of an individual being, with an ever-changing actuality of infinite complexity sustained by constant multiphasic interactivity. Singularities, dyads, triads, and sets are expressions of unity. The simplest expression of unity is the relationship of two phenomena, like physicality and mentality, or unity and multiplicity.

The existence of unity may be psychophysical or sociocultural, simple and/or complex, definite and/or infinite. The logical numeric expression of unity is that of 0 and 1, or just 1, representing the unity of numeric logic and all numbers. That is so because unity and identity can only exist in relationship to something other, such as duality, diversity, disintegration, separation, division, multiplicity, or nothingness (etc).

The logical interdependence of disunity and unity make them a prime example of primal dyadic unity. Primality is always integral to unity and vice versa. Ultimate unity is embodied and expressed as the wholeness of universal reality. No expression of unity has greater primality than the prime primal P or the number 1, symbolizing primal unity and its logical and actual integrity. Its primal primacy makes unity a prime expression of primality.

Duality: Sexuality (the functional principle) may not prove that nature favors duality, yet it offers fairly convincing circumstantial evidence. Of course, unity, multiplicity, extensionality, expansivity, and activity make duality seem an inevitable element of the morphological structural principles of being.

Naturally, without duality, equality would be impossible; and addition, equations, the rest of maths, and sex would be unthinkable (because we would be nonexistent). Likewise, without it (the principle), all phenomena related to and enabled by the nature of 2 (the number) could never exist. For example, the interdependence of mind and body, intellect and existence, subject and object, mentality and physicality, symmetry and asymmetry, being and nothingness, reality and unreality, and all the other logical dyads depend on the properties and potentials of duality.

Obviously, for science and maths, duality, its expressions, and embodiments are critical necessities. In both physics and maths, the dualism and differences of models and realities are as important as the relationship of possibility and probability. Losing track of the distinctions causes paradigms and researchers to stray, ever further from realism and usefulness. Failing to recognize and accept the dyadic relativity of geometry and numbers as intrinsic to the evidence of natural form and structure affirms the previous truth. Oddly, duality enabled the false dichotomies that caused and still maintain most other psychosocial problems of the world.

That fact is confirmed by 3 millennia of deficient number theory and nearly 160 years of immature algebraic geometry. For example, not seeing the relativity of the

intrinsic principles enabling forms and structures of carbon, carbon compounds, and the semiotic expression of numeric and geometric logic enabling Riemann's zeta function (\Re_z) prevented discovery and development of a satisfactory proof of his hypothesis for 158 years.

In other words, not seeing the interdependence of form and structure, and the reciprocal nature of unity and duality, 1 and 2, and -2 and $\frac{1}{2}$, made it impossible to see why graphing \Re_z can only do what it does, no matter how many trillions of iterations continue its functional process. Another odd fact is that most mathematicians were long prejudiced against $2n$ (even numbers) and other nonprimals, in favor of being fascinated by the primals (as if they were totally unrelated, independent flukes of accidental chaos). That enforced selective inattention to the obvious relationship of $6n$ (and hexality) and primality—making all primals p_x adjacent and directly related to multiples of 6—enabled by the relativity of “even” primality $2n$ and “odd” primality $3n$.

Now, this could seem silly, if not for the evidence of more than 10 million carbon compounds enabled by the same natural, enabling morphological-structural principles. So, clearly, the infinity of possible symbolic values of 2 and all $2n$ affirm the reality and relevance of duality as an essential necessity of being, and its metalogical nature. So, a truly sufficient definition of duality is nonoptional element of optimum ontology, and science in general.

Pentality: This definition skips the priority of triality and quadrality, because they are intrinsically related to duality, by extensionality (etc.). Likewise, the nature of 5 and its expressions/embodyments (pentagonality, etc.), directly relates it to duality and triality ($2n$ and $3n$), and all related realities.

Naturally, extensionality (etc.) also relates pentality and geometric pentagonality to hexality, and its morphological structural possibilities. For example, because of their enabling ensembles of metalogical principles, we see the additive extension of 2 and 3 enabling 5 and many $5n$. Additive extension also enables hexality as an expansion of unity with pentality ($1 + 5$ and $5 + 1$, or as $2n$ and $3n$). Of course, that can seem either a trivial or nonsensical notion. On the other hand, DNA, hydrocarbons, boranes, carboranes, and carbohydrates offer quasi-concrete proof of universally pervasive morphological-structural relevance.

For instance, as shown in the proof of metalogical principles enabling \Re_z and C_{60} (etc.), the intimate relationship of 5 and 6—pentagons and hexagons—is obviously not an illogical accident. Boranes, carboranes, and C_{60} also make the relativity of 60° and 72° angles and the double Phi-Fibonacci spirals in nature more obvious. Thus, 72° is the key angle relating pentagons to Phi, the “Golden Ratio” (etc.) and the dynamic double helices in DNA and dual (hypertrochoidal) spirals in sunflowers and scaly stemmed plants (etc.).

Pentality makes DNA's predominantly pentagonal structural elements (monomers) possible, while also making C_{60} a an impressive proof of natural polyhedral geometry. Pentality also enables the structural functionality of many of the 10 million+ carbon compounds and their structures.

Hexality: Being clearly favors the unity of duality and triality expressed in hexality (enabled by extensionality and expansivity, among other metalogical principles of form, structure, functionality, and relativity). So, hexality is intrinsic to the structural integrity

of many physical and virtual forms of being, either directly or indirectly.

Yet, words are less convincing than diamonds, graphite, hydrocarbons, carbohydrates, beehives, and the organic chemistry of life. Clearly, the intrinsic metalogical structural potentials of hexality make carbon (the 6th element) the 4th most abundant element of physical reality. Naturally, its integral union of the potentials of duality and triality also make hexality the logical anchor for the expression and locations of numeric primality. Countless quintillions of primal integers are adjacent to a multiple of 6 ($6n \pm 1$), and only there, with only 2 primal exceptions (2 and 3). Obviously, the nature of being's enabling metalogical structural principles also make hexality a necessity of geometry, trigonometry, and maths in general.

For example (with summary digital reduction), using base-10 numbers, the key angles and ratios of trig (except 30° and 60°) each reduce to a primitive digital "root" of 9, their common digital identifier (d_i). Of course, because of academic nonsense, that may seem a coincidence of illogical chaos. Yet, the key numbers of trig, geometry, and geography—360, 180, 90, 72, and 45—all summing to a d_i of 9 supports proof with the pervasive evidence of organic chemistry (carbon-based compounds requiring the nature of hexality, hexagons, and $6n$).

Simplicity: Simplicity is a subsidiary principle of form and structural meta-logic, intrinsic to and enabling all other principles and irreducible expressions of numeric logic and geometric metalogic. Unity, individuality, integrity, form, structure, and complexity enable and are enabled by the actuality and possibilities of simplicity.

Naturally, simplicity and complexity are logical, interdependent complements of each other. Evidently, realizing that, Einstein saw that "everything should be made as simple as possible, but not too simple." Complication is the negative, noncomplementary opposite of simplicity.

Typically, the more confusing a situation, system or theory becomes, the more complicated and estranged it is from natural metalogic and reality. Thus, powerful, deeply explanatory, elegantly simple theories are typically the most accurate. Occam, Newton, and Einstein were not the only fans of the natural potency and relevance of simplicity.

Nor does it take scientific expertise to recognize, understand and appreciate the importance of simplicity. Even children and lucky fools can appreciate it.

Complexity: It, the principle, is a property of form, structure, and meta-morphological principles. So, both simplicity and multiplicity can be expressed and embodied as complexity. That is so because simplicity is the interdependent logical complement of multiplicity, the prerequisite of complexity.

A complex phenomenon is not necessarily complicated. The whole of universal being and logic are prime examples of complex phenomena compounded of the simplest elements, principles. Actual complexity is a primal requisite and result of nature's negentropy because, as complexity increases, so do potentials and the flow of energy, enabling new forms of order, interaction, and change.

Complication retards progressive change and smooth flow of energy, decreasing orderly interaction. Actual expressions of complexity pose no problems for logic ecotects, computers, logic infrastructure. A simple theorem or formula (like \mathfrak{R}_2) can relate to infinite complexity, enabling more complex operations, interactions, and further

development of complex results. Yet, a complicated theory or logic infrastructure may be based on mistakes, misconceptions, erroneous assumptions, misinterpretations, misperceptions, and/or inferior logic. Thus, defective theory can and does decrease creative interaction, development, and successful evolution.

Totality: Totality, the metalogical principle, enables the existence of **a**) all qualities, elements, and potentials of a form or mode of being, or **b**) of a set or group or field of phenomena. Universal totality (U_T) is all phenomena, everything, the whole of being, including its principles and qualities. That also includes what is present and/or expressed only as potentials, ideas, virtual symbols, and imaginary or illusory phenomena.

Naturally, totality includes the results of the past and memories, but not what no longer exists, or never existed, nor what may happen in the future (except as dreams or imaginings or potentials). So, totality cannot include or begin as an impossible yet seemingly endless, boundless expansion of nonexistent nothingness into everything from the middle of nowhere.

Recall that, so far, what we can detect of U_T is at least ± 93 billion lightyears in diameter, with ultra-colossal currents of plasma and galaxy superclusters (entering and exiting and almost crossing it). So, we can be sure that U_T is immeasurably larger and “older” than the imaginary Big Bang. Also recall that, beginnings, explosions, and initial conditions require energy, and energy requires something other than nothing, nowhere, and nowhen.

Holontology supports the Big Now Theory of actual totality. We can think of cosmic totality as the infinite whole of reality, greater than the sum of the individual totalities of every subsidiary form of being, every person, place, or thing in the current moment of universal presence (including all its nonphysical enabling principles).

For example, the ever-changing complexity of each human life is immeasurably greater than a sum of its physical parts. That makes us infinite and transfinite expressions and embodiments of universal being and its intrinsic enabling principles. So, clearly, humanoid beings may be the only beings who embody the totality of all universal principles. Yet, if universal totality came from anything else, the most likely source is undetectable hyper-energy and the total meta-energy of metalogical principles, properties, and qualities (of universal phenomena).

Infinity: Universal totality, the ever-changing wholeness of being, is the original, all-inclusive expression and embodiment of infinity, the principle. Except for principles, the actual conditions of universal phenomena (and beings) are constantly transient, making them both transfinite and infinite. The logical identity and psychophysical or meta-energetic actuality of principles, ideas, and virtual numbers are constantly definite yet boundlessly immaterial, thus changeless, thus infinite. That can be understood as an integral microcosmic expression of the dyadic relativity of all finite identities and all infinities.

The interdependent relativity of principles, forms, structures, functions, relations, entities, and interactions enable all finite and infinite forms of existential phenomena. So, we can think of and represent universal being and its actual totality —enabling and

enabled by its infinity of integral metalogical principles—as the ultimate infinite set that includes itself and the transfinite null set, $\{\emptyset\}$ (of absences, nullities, illusions, etc.).

Extensionality: The possible series and sequences of numbers confirm the reality and potency of extensionality and extensivity as interdependent enabling principles of being.

Of course, many natural examples of extension are present and visible, with many more invisible. Maths, science, theory, and proofs would be impossible without extensionality. The proofs of **RH** (etc.) are proofs of that theorem. The **RH** problem is perfectly relevant because it revolves around the issue of whether (or not) Riemann's zeta function (\Re_z) and its graphs are trustworthy, *i.e.*, consistently reliable. As proven elsewhere in this work, **RH** is true because the nature of \Re_z makes it permanently reliable. Part of its nature—that enables it and affirms **RH**—is extensionality.

Clearly, in the absence of counter-vailing factors, any phenomenon or process that can be extended will be extended (to the limit of its extensiveness). The best proof of that is the vastly extensive extension of the current moment of being, AKA the cosmos.

Otherwise, duration and persistence would be impossible. In that case, existence and science would also be impossible. However, geology and archeology provide solid proof that we exist and persist, proving the viability of extensionality. That also proves the importance of adequate definition and understanding of extensionality and extensivity for realistic set theory and the theory and metatheory of macro-ontology.

Expansivity: Like extension and extensivity, expansivity and extensionality are relative, interdependent principles enabled by the metalogical principles of being, form, structure, functionality, and relativity.

Expansion and expandability exist because of ensembles of elemental enabling principles. So, wherever possible, expansivity enables expansion. When expansivity is not a metalogical element of an ensemble of enabling principles, expansion is either impossible or illusory, unreal. For instance, empty space and undefined theoretical stuff have nothing to expand.

In other words, expansion requires real form or structure. Of course, maths does have real form, structure, and functional potentials. So, numeric logic enables virtual, multiplicative, and exponential expansion. The principles enabling geometry and trigonometry also enable virtual geometric expansion that can be expressed with symbolic numeric and graphic semiotics.

Validity: Truth is a principle and a concept enabled by validity, actuality, and reality, the principles. Truth, the concept, is multivalent, depending on context and its domain of discourse. Validity always makes truth the opposite of false (invalid or unreal) phenomena or claims.

Essentially, truth is what is ultimately valid, or real, beyond and before or without us and our opinions. Yet, our intellect is a dualistic function of mentality, enabling categorical perception of relative phenomena, our experiences, perceptions, and ideas about them.

That enables the existence of relative truth, conditionally valid concepts, theorems, and axioms (etc.). For instance, the principle of mentality enables perceptions, conceptions, consciousness, intellectual discernment, illusion, delusion, and evaluation

of results of interaction. That gives rise to knowledge of relativity, distinctions, identities, differences, similarities, qualities, values, and ethics. So, essentially, relative truth is a principle of practical logic enabling its own functionality as an element of semiotic and provisional logic. Relative truth is also a resultant variable of sociocultural norms and semiotics, a derivative of the linguistic logic, ideology, and dominant paradigm of a host culture.

Without a paradigm based on a metatheory of nature's actual metalogic, socialization and conditioning make some confusion about the nature of truth inherently unavoidable. The more socially generated bias, the more the confusion about truth. The definition of truth in an unbiased, purely logical metatheory explains truth as reality, an actuality. For example, a true statement expresses concepts or perceptions congruent with natural reality, or it may describe the nature of a person's activity, or of a place, an event or thing, or a principle.

That truth is what makes the valid metatheorems of a well-founded metatheory true and provable within the context of its own paradigm and domain of discourse.

Quality: We normally encounter it as a subjective, psychosocial construct or concept (or imagined per personal consciousness via culturally induced bias).

Yet, quality, the principle, like property, is an integral principle and property of the enabling metalogical principles of being. In fact, quality enables the qualities and potentials of all other primal principles of being. It also enables the existence and qualities of real values, and of numeric and symbolic values.

Thus, quality enables counting, measuring, mathematics, and science, especially bio-ethical axiology, the science (and study) of natural values. However, conceptions of quality vary from person to person and from culture to culture, sometimes from moment to moment. Yet, within the various orders, classes, and types of phenomena (including beings), phenomena clearly exhibit qualities and degrees of quality. Without it, sanity, analysis, science, maths, art, and technology would all be impossible. If quality were not a primal natural principle, then there could be no wellness, illness, inferiority, superiority, excellence, beauty, and goodness (etc.).

Also, because of it, liquids exhibit the qualities of wetness, fluidity, viscosity, deliciousness, and so on. Likewise, different kinds of stone embody qualities of solidity, hardness, density, beauty, and so on. The characteristic qualities of properties (of nature), elemental composition, form, and structure depend on it, the metalogical principle. So, plants and fungi have qualities of living beings, and of foods, medicines, poisons, and much more.

Clearly, living beings embody and express the qualities determined by the nature of their species, their individual nature, their capabilities, potentials, limitations, behaviors, habits, and relationships (to other beings, groups, places, and things); and they all express their enabling ensembles of metalogical principles. So, the qualitative aspects of reality are essential to the whole of being and its subsidiary phenomena.

For instance, human intellect depends on and expresses the quality of each of us (and of our knowledge and experience). Thus, if the principle of quality were not intrinsic to being, then intellect and effective analysis, valid theory, justice, and society

would be impossible.

Quantity: Like dimensionality, quantity is a subsidiary principle of the metalogical principles of being, specifically: form and structure. Naturally, embodiments and/or expressions of quantity are also enabled by other primal principles: physicality, mentality, awareness, cognitive perception, consciousness, and so on.

Quantity is also a psychophysical phenomena enabled by the principles of relativity, integrity, individuality, unity, and multiplicity. Also, all perceptions of quantities are relative to perceivers' qualities, conditions, conceptions, and metrics. Without the principle of quantity nobody could perceive things as either few or many things. Numerous or scarce, large or small, seeing and knowing more or less of something require quantity, the principle. Fully understanding and appreciating the vast scale of the field of being (the cosmos) and its subfields (including us) requires real understanding of quantity. Otherwise, as is normally the case, we tend to confuse notions and illusions of quantity with the reality.

Notions of money and wealth are perfect examples of imagining illusory quantities. Worse yet, without realizing the true nature of quantity, we all too often confuse its value with the value of quality. Often, we then prefer illusory quantity over real quality. That error pervades current SM paradigm science and maths. Yet, without understanding quantity and value, real, unreal, etc., there can be no qualitative progress in science or maths.

For example, confusing quantity with quality (and vice versa) makes it impossible to recognize the importance of **a**) intrinsic metalogical principles of life, **b**) natural reality, **c**) hyper-fluid mechanics, **d**) plasma physics, **e**) metamathematics, and **f**) sanity (etc.). That prevents or retards understanding and development of better theory and metatheory. So, understanding quantity, the principle, is essential.

Dimensionality: Dimensionality, the principle, is a subsidiary property and aspect of the interplay of form, structure, functionality, physicality, and mentality (the enabling principles). Of course, that fact of being is enabled by relativity and integrity, which enable and sustain our perceptions and conceptions of dimensionality's properties (space, distance, depth, up, down, etc.).

Dimensionality enables the development and use of psychophysical and purely mental conceptual constructs for the sake of thought and communication. Yet, careless use and abuse of the term "dimensions" (in physics and maths) caused and perpetuates an unfortunate state of general confusion. For example, dimensions do not exist in any pre-existent, concretely physical, independently real way. In maths, "dimension" has a strictly mathematical definition that makes it convenient for thinking about various mathematical objects and results. So, dimensionality, the principle, enables perceiving, describing, and interacting with phenomena enabled primarily by form and structure.

Yet, the popular notion of 3D "space" mistakes perceptions and misconceptions as realities (of the field of being and its attributes of dimensionality). Likewise, believing in multiple dimensions or reality in a curvy "space-time" geometry is caused by misunderstanding the principles of dimensionality, physicality, activity, and reality (etc.). For example, at well beyond 90 billion lightyears in diameter, the cosmos is either infinite or so inconceivably vast that it can be considered a boundlessly infinite sky-

ocean, without up and down, no height, width, or depth.

Only dimensionality, the nonphysical principle, enables perceptions, measurements, and ideas about any kind of form's spatial properties. So, we may as well believe that the universal regime of hyper-luminal energy enabling, infusing, and affecting galaxies and all other energy phenomena is one whole event or single phenomenon, not curvy, multi-dimensional spaces, exploding in a nonexistent continuum of magical QM maths. Like space in a room and its dimensions, empty "outer" space is a mental phenomena enabled by our senses, social conditioning, and a principle and property of form, dimensionality.

If the universe had an actual dimension, then it would be the all-inclusive infinity of its field of being, life, and energy, enabled by integral metalogical principles. The extra 4th dimension in QM's probabilistic-statistical maths (and post-Einsteinian notions) seems a useful mathematical fiction. However, it should trick nobody into believing it represents a self-existent yet totally illogical, mysterious thing, "time" (the illusion or delusion). Yet, all of QM and mathematical dimensions are enabled by truly real and reliable principles. (see defs., Principles & Logic)

Physicality: Like mentality, physicality is a natural metalogical principle that enables the embodiments, expressions, properties, and qualities of its nature and potentials. In fact, the primal metalogical principles that enable physicality (and its properties) are what enable its forms, functions, effects, and our perceptions of them.

Because the nature and actuality of physicality and the other metalogical principles of being were neither recognized nor fully considered, most modern scientists have lacked a generally accepted definition and explanation of physical matter for decades. Of course, we now have abundant evidence and proof of the logical relativity and interdependent potentials of physicality, mentality, and maths. Yet, until now, mathematicians—including Riemann, Gauss, Euler, Euclid, and Pythagorus, among others—clearly failed to fully recognize the nature of the principles enabling, empowering, and sustaining them.

However, some visionary pioneers of ancient times came very close to understanding matter. As expressions of principles, some early thinkers intuited a nonphysical source of physical things, beings, and processes. Yet, they failed to realize optimal understanding. Now, free of confusion about physicality and mentality, nothing restricts realization of the inseparability of the expressions and embodiments of physicality and mentality, the principles.

Embodied and/or expressed in dyadic actualization—of primal creativity and life—cosmic phenomena are enabled and sustained as integral expressions and embodiments of being (and its magneto-dielectric 'field' of energy, and its enabling principles). Thus, energy, thought, information, communication, bodies, and the activity of living beings require physicality, yet it is enabled and sustained by the meta-energy enabling all the metalogical principles of nature.

Otherwise, there could be no action or motion, nothing to move, no time to move anything, no elements, no explosions, no DNA and RNA, no bodies, nothing to serve as media for communication or the encoding of information by intelligent beings with minds.

Without the meta-energy and metalogical principles of physicality there would be no

plasma, no stars, no galaxies, no fuel, and no physical properties to sustain them. All phenomena contain at least the essence of physicality, the integral potentials of being, form, structure, and function. They enable the existence, properties, qualities, and potentials of integrity, dimensionality, energy, and force. So, instead of believing in partial descriptions, as if they were realities, we can and should follow the example of the ancient Buddhist sages.

Our visionary ancestors saw elemental energy and ‘matter’ as psychophysical phenomena. Instead of believing in solid, permanent particles of stuff—and settling for an inscrutable equation ($E = mc^2$)—they understood the psychophysical constituents of existence as solidity, cohesion, motility, temperature, and color.

Of course, those five subsidiary principles and properties make “things” perceivable. Yet, no things, bodies, and beings would be knowable without the universal enabling principles and presence of awareness. In other words, we can think of “atomic” energy phenomena simply as energetic events or processes expressing the principles and properties of the objects of perception we experience (by virtue of our senses and cognitive functions).

However, from the impossible perspective of a mindless, purely mechanistic universal field of magic energy, without pre-existent principles (like physicality and mentality), there could only be an infinite wholeness of totally formless no-thing-ness [*sic*], without forces, objects, parts, bodies, and places; and no beings, no minds, no logic, no principles, and no processes, anywhere. So, clearly, forms, elements, things, places, biomes, organisms, and conscious selves would all be impossible in a cosmos without physicality and the other enabling metalogical principles of nature.

Luminosity: Like activity, luminosity is a natural functional principle. Its effects—emanation, radiance, radiation, etc.—are enabled by other metalogical principles, especially activity and motility, and their primal expression, energy.

Hence, all forms and modes of being that embody and express the nature of physicality require and exhibit energetic interaction. So, the nature of luminosity is clearly intrinsic to the nature of energy. Clearly, luminosity is an essential principle enabling visibility, making both critical essentials of life and sentience (etc.). Of course, if that theorem were untrue, nobody would see and know anything (about energy, electricity, etc.).

So, eliminating confusion about the nonphysical, metalogical nature of luminosity, the principle, is essential for real progress of the sciences, especially QM physics, astrophysics, and macro-ontology (etc.). For example, understanding the true nature of luminosity and being enables realizing the potentials of bio-luminescent semiosis, psychophysical field-effects, and phenomena typically considered paranormal or simply mysterious.

Mentality: Like physicality, mentality is a functional principle intrinsic to natural metalogic, yet subsidiary to primal principles. Natural functional logic and mentality are prerequisites of intelligence, of thought, communication, semiotics, maths, and other expressions of the potentials of practical logic and the more primal principles of existence. The reality of mentality—as an intrinsic principle of universal being—is proven by the presence of scientists, mathematicians, and readers. If mentality was not

an intrinsic universal principle, at least virtually, as potential, then maths, writing, reading, mathematicians, writers, and readers would be nonexistent. If that were the case, information could not exist.

Because of mentality, some beings with natural bodies and minds might dream and remember or imagine a fictional universe with only purely mechanical entities. Yet, AI-enhanced supercomputer systems are mechanized expressions of our potentials of mentality, but they have none of their own. To simulate intelligence, mindless computers require prior invention and initial programming. Their instructions are created by beings who embody and express the potentials of natural mentality.

Visibility: Visibility is a functional principle enabled by mentality, luminosity, and an enabling ensemble of other metalogical principles of being (primarily form, structure, functionality, and relativity, among others).

Sight is obviously extremely important for optimal human functionality. It also supports a basic understanding of the nature of presence and awareness, perception, and appearance. For example, vision would clearly be impossible without the principle of visibility, because sight requires the existence of psychophysical phenomena—beings, things, places, subjects, objects, etc.—experiences of perceivers and objects of perception. So, we can accept visibility as proof that mentality and physicality, the principles, are interdependent elements of being that enable our presence and awareness.

Obviously, that supports proof that the nonphysical principle of visibility enables experience of visible forms of being, internally (dreams, daydreams, visions, hallucinations, etc.), and externally (“physical” things, places, events, beings, etc.). In other words, vision, sight, and what we see validates the reality of the elemental nature of being, its enabling metalogical principles. Therefore, understanding the nature of visibility is essential for optimum science and viable holonomic ontology, holontology.

Memory: The key principle that enables the possibility of remembering and memorization is as nonphysical as the contents of what we remember of the past. Our memories are not only imperfect, the best of them are not what they seem.

Memory is a principle of mentality, both are mainly enabled by the metalogical principle of functionality. The fact that all nature’s enabling principles are nonphysical can be accepted as evidence that the contents of our memories are also nonphysical.

This does not mean that that our memories have nothing to do with brains and electromagnetic field-effects. However, neurons, their electrochemistry, and electromagnetic emanations only mediate our experiences, thoughts, and memories. For example, mentally well adults realize that the contents of illusions and delusions are unreal, nonexistent, thus completely nonphysical. So, likewise, we can understand that the nature and contents of thoughts and memories are equally nonphysical.

We can also see a proof of that demonstrated by the universal intelligence that informs the DNA and RNA of every cell and mitochondrion that make our bodies and minds what they are, as they are. Yes, DNA and RNA or chemicals made of molecules of elements, enabled by energy and the enabling principles of being. Yet, the information enabled and encoded is as nonphysical as the principles that enable being itself, and us.

So, for the sake of good science, viable ontology, and good understanding (etc.), we should dispense with the absurdities of arrogant materialists who pervert logic, abuse

science, and retard real progress (of society, etc.). After all, if memory were not a reliably constant principle and being's nature, there could be no instinct, nor any inherited expressions of the principles of form, structure, functionality, and relativity (relations, etc.).

Of course, memory is an intrinsic, nonphysical principle of mentality and being. So, we can understand the meanings of what we learned; and we can develop and understand new theory and metatheory of macro-ontology and meta-ontology (etc.).

Curiosity: Curiosity is a subsidiary functional principle of mentality that enables intelligence, and demonstrates it. Albert Einstein said that relentless curiosity was an essential enabling cause of his work and his results. This definition of curiosity is also proven by the curiosity of every octopus, dolphin, raccoon, African grey parrot, dog, and every other intelligent species on Earth. So, it is clearly important to upgrade the definition and understanding of curiosity, especially for any kind of viable ontology.

Obviously, for real progress of science and society, we need more and better recognition and appreciation of curiosity as an essential element of intelligence and adaptive competence. In fact, our existence and the way we exist prove that curiosity and adaptivity are intimately interdependent and interactively essential for evolutionary intelligence. So, the lives, activities, and results of Einstein, Leonardo Da Vinci, octopii, smart dogs, and cats prove that the principle of curiosity is essential to genius, the cosmos, and its primal intelligence. Therefore, a good understanding of curiosity is essential for optimum macro-ontology and meta-ontology.

Emotionality: The key principle that enables emotiveness and emotions is a functional principle. Of course, emotionality is enabled and empowered by the ensemble of natural metalogical principles that enable all mental and physiological interactions and potentials of sentient beings.

Naturally, the most primitive living beings seem to exhibit little or no symptoms of emotion. So, holonomic ontology and meta-ontology deal only with phenomena we can recognize as definite psychodynamic and physiological expressions of emotion. For this definition, the best examples of the potentials of emotiveness are the good, bad, ugly, and atrocious interactions of human beings. In other words, as proven by neuroscience, emotionality, mentality, and biochemistry are constantly interdependent; and their effects are almost instantaneously interactive.

Obviously, scientists, theorists, mathematicians, and philosophers are living beings, subject to the causes, properties, and effects of emotion. Sadly, too often, the worst effect of excessive or traumatic emotion is mental and perceptual limitation. However, even emotions that may seem subtle or minor can be symptoms of chronic subliminal pattern of dysfunctionality, like pandemic "authoritarian personality syndrome" or narcissistic personality disorder.

When an entire society suffers normalized psychopathic disorders the results are always disastrous. The ancient and modern empires, fascist Italy, Japan, Germany, and Russia provided many horrific examples. Increasingly authoritarian dysfunctionality impacts, subverts, and retards the progress of science and education. The pre-Renaissance effects lasted for well over 2,000 years. Yet, now more than ever, real progress requires real commitment to ecospheric awareness of all the "internal and

external” factors that affect the quality of R&D, education, and the results.

Commitment to self-honesty and constant bio-ethical integrity can be painful. So, effective paradigm upgrade requires courage and truly scientific discipline.

Sensitivity: Sensitivity is a subsidiary functional principle of mentality (enabled by the primal metalogical principle of functionality).

However, sensitivity is now often equated with neurotic, fear-based patterns of habitual over-reaction. Yet, without the principle of sensitivity, sense perception and awareness would be impossible. So, understanding the actual nature, reality, properties, and potentials of sensitivity is critically important for understanding the nature of being and intelligence. That clearly makes the principle of sensitivity essential to the paradigm and domain of discourse of holontology (macro-ontology and meta-ontology).

Therefore, recognizing and understanding the real nature of sensitivity is critically important to viable psychology, sociology, anthropology, ecology, and the possibility of a potentially positive future of human society.

Sexuality: As a subsidiary principle of form and functionality, sexuality is directly, interdependently relative to all the basic metalogical principles of being.

For example, though its enabling structural principles may seem obscure, the virtual structural integrity of sexual phenomena is expressed and embodied in every mating couple and every fertilized egg or ovum (embryonic off-spring). Also, although it seems that nonsexual forms and modes of being may have existed for many billions of years before sexual beings, the enabling principles and potentials had to exist first. The realities, properties, and potentials of primality, primacy, and duality confirm that hypothesis. So, holistic meta-ontology and holonomic metatheory require realistic consideration of sexuality and its biological and ecological embodiments and expressions.

Of course, sexuality’s interdependence with physicality, mentality, emotionality, and reality—and the biological, ecological, and psychological effects of sexuality and sexual phenomena (female/male physiology, relations, interactions, etc.)—make it inescapably intrinsic to the nature and results of R&D by human beings. One of our greatest scientific pioneers, Nobel laureate physicist (and highly sexual bongo player) Richard Feynman, provided living proof of that theorem.

Thus, macro-ontology, effective education, and realistic metatheory of science (etc.) require accepting the integral necessity of sexuality as an essential causal element of being’s metalogical nature. A tragic counter-example is the history and ongoing disaster of the various sociopolitical and religious systems of attempted socioeconomic control of with attempted sex-control policies and stratagems. Clearly, the perversities of Victorian sexual norms and deviance were direct results of suppressive authoritarian social policy, Calvinism, Puritanism, and exploitive neo-Feudalist imperial monopolism. Obviously, keeping vast majorities of subjects (victims, etc.) confused, deceived, and conflicted about sexuality (and nature) could only cause increasingly catastrophic consequences.

Thus, ignoring the intrinsic, pervasive power and effects of sexuality—as a potent element of reality and humanity—retards and/or limits the effectiveness of our research, analysis, and results. One may as well try to ignore or suppress the energetic power of the sun or the galaxy or life.

Humanity: Humanity is a principle of being, not the whole of our species. So, the essential properties and qualities of humanity enable and sustain the way of life that expresses its metalogical nature.

Naturally, it may seem that humanity and human being are enabled partly by positive and negative qualities, like creativity and destructive negativity. However, the principle and qualities of humanity require no useless or unproductive, destructive phenomena or potentials. It may also seem that humanity must include or subsume animality (or even divinity). Yet, though they are related and interdependent, the principle of animality and humanity are separate, distinctly unique principles of being.

That lets us consider their embodiments and expressions as related, yet uniquely distinct classes of phenomena. Hence, what can seem naturally psychopathic qualities and behaviors of our species can be understood as abnormal (or subhuman)—atavistic perversions of animality—not expressions of humanity, the principle and its realities. The relative complement of that theorem is the relativity of humanity, spirituality, and divinity.

For example, without humanity, the principles, concepts, and symbols of divinity and sacredness would be impossible or meaningless. So, humanity enables and sustains the emergent potentialities and qualities we think of as divinity and spirituality. Yet, relativity makes humanity, divinity, and spirituality interdependent. However, the cosmos, life, wonder, and mystery were already present. Like other elemental principles (of being, the cosmos), humanity is neither superior nor prior to other logical and metalogical principles and realities.

Therefore, animality and the other principles that enable, empower, and sustain living beings are neither inferior nor subordinate to humanity. Still, the optimum realization of humanity gives us truly special opportunities, abilities, and options—for exploring all our possibilities and the potentials enabled by the nature of being, and life.

Of course, the special abilities that enable our possibilities and potentials are our ways of using mind, symbolic communication, and complex sociocultural interaction. Thus, as far as we now know—at least on this planet—the human species is uniquely blessed and cursed. We can help save our habitat, Earth's biosphere, from the ongoing consequences of our species' mistakes, insanities, and atrocities, or else civilization and the global quality of life will keep deteriorating.

In other words, uniquely, our species can choose to accelerate the next great die-off level mass-extinction, or to prevent the worst-case scenario. The only requirements are optimum humanity [enabled by] sufficient **a**) empathy, **b**) sanity, and **c**) compassionate responsiveness. Unfortunately, mental and cultural illness can let our capacity for expressing and appreciating the properties and qualities of humanity.

That clearly makes appropriate definition and adequate understanding of humanity essential to proactive ontology and mass-psychotherapy.

Society: When we hear the word, we usually think of society as its expression, a social group or all social groups, human or otherwise. Yet, society is a principle enabled by being and its ensemble of enabling metalogical principles (nature).

Society and societies are not synonyms for culture and cultures. Culture it is what beings typically do with each other, and how. A society is a system of systems made up

of theory—ideas, notions, assumptions, beliefs, biases, semantics, semiotics—rules and, in some cases, law. Of course, society and culture are interdependent and interactive. So, civilization is enabled and limited sociocultural paradigms.

At best, the qualities and potentials of a society enhance its host culture and its quality of life. At worst, society becomes something like a pandemic cultural illness that infects multiple generations. Naturally, imperialist societies were all destroyed by their malignant negativity and increasingly severe dysfunctionality. Unfortunately, some of the ill effects and paradigms of the past remain and maintain cultural illnesses, some more deadly than others. Yet, sociocultural paradigms are installed in us, in our brains, families, communities, and in national societies. So, authoritarian rulers, pandemic authoritarian personality disorder, malignant narcissism, and ecocidal egomania are now on the rise.

Obviously, understanding the principle, properties, and potentials of society is crucially important to optimum macro-ontology, sociology, cultural anthropology, and to science in general.

Divinity: Relativity makes the principles of divinity and humanity interdependent. The experience of sacredness and the idea of divinity are enabled by humanity and the metalogical principles of relativity, functionality, structure, form, physicality, and mentality (etc.).

Of course, without the principle of society and its expressions and embodiments, even the word “divinity” would either be impossible or meaningless. In fact, the history and prehistory of our species prove that the inseparable interdependence of humanity and society enabled all we achieved and ruined. So, thinking that religion and divinity could develop independently of society and humanity would be foolish.

Yet, for the sake of a sense of certainty—seemingly supporting security—most of us are compelled to believe what we believe and ignore what we ignore. Hence, religious conditioning can affect scientists as much as anyone, even if they consider themselves atheists or non-theistic Buddhists. So, neither science nor logic can put an end to misunderstandings, hostilities, and wars caused by conflicting belief systems and theological differences.

However, understanding the difference between divinity and what it is not could help, at least theoretically. For instance, divinity is a principle, a property, and a word, not the words and names people associate with it and their beliefs about a God, gods, and/or spirit. So, though there may be more than 1404 “names of god” in modern India—and more than a billion Indians may consider the name of a deity sacred—most of them probably have no fear as using those names in conversation. Orthodox Jews, among others, may believe in 72 or more names of what they believe is the ultimate reality of divinity, but some consider seven or eight of those names too holy to be used in ordinary discussions. Oddly—though their version of the Jewish Bible includes the super-holy name meaning “the god of gods”—most Christians use a tiny fraction of the holiest names, or else just one, or two or three (or more, if Jesus and Christ are included). Now, despite the belief that Allah and Yahweh (AKA YHVH or Elohim or El Elyon, etc.) are the same God described in the Holy Book of the Jews and Christians, most Muslims know and accept only one name of God.

Regardless of all the differences, similarities, history, at atrocities (and because of

them), some of the believers are still willing to kill and die for their beliefs and opinions. For example—no matter how much evidence and proof are discovered—some members of the various sects of the world’s religions will keep ignoring or disbelieving the reports of historians, linguists, archaeologists, and paleo-anthropologists. Obviously, most Christians, Muslims, Jews, and Hindus seem unaware of the findings of their own best theological historians and archaeologists or else, possibly, they simply refuse to think about anything that challenges their favorite beliefs.

However, despite the fact that science will never replace theology or religion, they are important subjects of bio-ethical axiology and meta-ontology. For instance, concepts and opinions about divinity, sacredness, and spirituality have so much psychological and social power that understanding them is essential for understanding society, humanity, and reality. If that were untrue, our opinions and beliefs about value and values would be very different, for having nothing to do with religion and beliefs about divinity and morality. Of course, history and prehistory that the way of human being, society, and cultures were heavily influenced by ideas and beliefs about divinity.

An ironic example of that is the modern anti-theological creation myth invented and maintained quantum mechanical cosmologists and corporations that control mainstream media (to maintain the neo-feudal socioeconomic system for its anti-ethical rulers). Now, neither macro-ontology nor meta-ontology can prove the existence of God or gods. Yet, they have proven that a big bang birth of everything—that began before anything—is not only an impossibility, but also an unscientific absurdity.

Bio-ethical axiology enables realizing that the motive for maintaining such absurd mass-confusion is **a**) greed, **b**) insane ambitions, **c**) conceit, **d**) hubris, and **e**) delusional notions of power (and security, etc.). In other words, we can trust realistic meta-ontology, and the importance of understanding divinity, the principle. Clearly, that understanding lets us realize the difference between reality and impossibilities. That also lets us see that misunderstanding divinity and reality could never make science superior to religion or make anyone totally immune to its influence. Unfortunately, that misunderstanding fostered and aggravated the perversion of religious ideas, opinions, and attitudes that caused and maintain the crises of modern science and civilization.

Spirituality: Like the principle of divinity, the principle of spirituality would either be impossible or meaningless without the principles of humanity and society. As in the case of divinity, science on its own can neither support nor prove the reality of spirit. Nor can science validate any particular version or expression of spirituality.

However, like any other concept or principle, spirituality can be understood by considering **1**) origin, **b**) causes, **c**) the enabling principles, **d**) its properties, and **e**) its potentials. So, sufficient curiosity, study, logic, intuition, and contemplation let us consider and understand the history and ongoing examples of what we call spirituality. First, we can disentangle it from religion. Religion, the word, comes from the ancient Roman word for rebinding, as if something was scattered or unbound. That implies that what was unbound was spirit or, possibly, the spiritual relationship of creature and creator.

This definition may seem arguable, but disproving it would require proving that divinity and religion existed prior to humanity and spirituality. Of course, that is as impossible as scientific proof of God and love. Still, archeological evidence of the

extreme antiquity of our ancestors' expressions and practices of spirituality preceded the history of complex religion by several hundred thousand years or more. So, we can look to the phenomena and experiences that caused our ancestors' sense of awe, reverence, and respect which led to extremely deep appreciation of being's mysteries.

For example, no one can say exactly when it began, but the indigenous Australians' ancient practice of subincision* (cutting open the urethra along the shaft of a teenage male's sex organ)—as part of their ritual initiation into manhood—shows that the mystery of sexuality, fertility, pregnancy, birth, and motherhood inspired a potent sense of supremely sacred value and benefit. Naturally, that was partly inspired by disaster.

The evidence discovered by geologists, archaeologists, paleo-anthropologists, and geneticists confirms that fact. For example, we also know that the ancient Maya and Aztecs thought of volcanoes as gods (or deities). Many modern Indian and Himalayan people still think of mountains as goddesses. Many modern Buddhists believe that spirits, deities, and gods dwell in natural things, places, and other worlds or realms. Many followers of the Japanese Shinto religion believe that event and animate objects possess or are possessed by spirits and gods. Clearly, all the above examples have extremely ancient origins, beyond knowing. Still, macro-ontology and bio-ethical axiology help us see that there is no way to separate or disintegrate the interdependent relationship of our natural preference for benefit, advantage, wellness, prosperity, and satisfaction from our notions and experiences of spirituality and spiritual phenomena.

Yet, the nature and spirit and the way of spirituality seem somewhat shrouded by vague and confusing notions and dubious rhetoric. However, though neither theology nor science in general can precisely define or fully explain either spirit or spirituality, meta-ontology and bio-ethical axiology can. That is so because their domains of thinkability and discourse enable realistic intuition and insights that enable holistic cognitive science, dynamic psychology, realistic phenomenology, definitive philology, and effective linguistics.

For instance, we say that a spirited horse has “spirit” because its unique ensemble of characteristics, ways, and natural enabling principles give it a unique expression of personality and activity. Likewise, the spirit of a human being or any other animal is a uniquely expressed combination of enabling principles, properties, qualities, and modes of expression (of its nature, especially the emotionality enabled by personality). So, we can understand spirituality as a quality and attitude expressed by people who respect and revere the nature of being, which enables our individual identities, personality, emotionality, and our characteristic ways of interaction.

For example, for most of the indigenous peoples of North America, their ancient concept of medicine related directly to the essence, nature, and ways of the various things and beings they encountered and experienced. So, each kind of place, stone, plant, animal, and person was understood as having his own unique spirit and potency, for better or worse. That ancient sense of the nature and intrinsic value of things and beings was clearly self-evident to all the most ancient cultures of human beings. In fact, the teachings and spiritual practices of many modern Buddhists, Christians, and Jews also have immeasurably ancient origins, and serve similar ecological, sociological, and psychological purposes. So, because of its interdependence with the principle of humanity and religion, spirituality is a central, very influential, and continually powerful causal factor in human communities, nations, and civilization.

Therefore, understanding the principle of spirituality (and its expressions) is critically important to the evolution and effective praxis of macro-ontology and bio-ethical axiology.

Responsibility: Responsibility enables the functions and interactions of even viroids and bacteria. Responsiveness is not always motivated by responsibility, the principle. At best—in the animal realms—responsibility enables appropriate action (of mind, voice, and/or body). So, claiming “responsibility” is a result of confusion.

Our expression of responsibility is conditional, often limited, or repressed. For example, for many animal species, parental responsibility is instinctual. For social species, social responsibility enables cooperation at altruistic behavior. Of course, the degrees of expression are affected by a complex mix of factors that can override instinct.

Humans can and often do repress instinctive reaction and response. At best, our most effective expressions of responsibility are mediated by appropriate socialization and adequate training. At worst, repression, suppression, and/or social subversion of responsibility causes and maintains mass-psychosis and monstrosity. Thus, adequately defining and referring to the principle of responsibility is important for optimal macro-ontology, reality, humanity, sanity, and society.

Empathy: Empathy is a principle, a possibility, and a potential experience. Neuroscience has found what are called mirror neurons that make empathy a built-in capability of healthy animal brains. Long-term studies have also shown that the brains of psychopaths have few if any functional mirror neurons.

Yet, like all victims of early childhood trauma, a psychopath has an overdeveloped amygdala. However, unlike most normal sufferers of PTSD, psychopaths can become predators, seeking payback, thrills, and neurochemical highs. Their mental functioning becomes more reptilian than mammalian. Therefore, psychopathic soldiers, politicians, executives, and serial killers are unable to empathize with the pain, sorrow, grief, anguish, and terror of others.

Clearly, empathy is essential to humanity, healthy mammals, and other social animal species. So, the principle and properties of empathy are essential to a holonomic ontology of humanity and the reality of being. Empathy also enables sympathy, pity, and compassion.

Yet, normal confabulation and confusion make sympathy, pity, and compassion seem like synonyms. That calls for resolution. For example, pity too often requires no empathy. Commonly, sympathy involves minimal empathy and little or no serious compassion. However, most civilized non-Buddhists equate compassion with pity or sympathy, or both. Yet, real compassion is spontaneously responsive and, thus, helpful, altruistic, sometimes heroic.

So, obviously, proper understanding and expression of empathy and compassion are critical for the optimum realization of optimal cultural wellness. Hence, the principle, properties, expressions, and understanding of empathy are essential for optimal ontology, axiology, science in general, and for sane civilization.

Joy: The principles, properties, qualities, and potentials of being—including life and sentience (etc.)—enable all the modes of pleasure and enjoyment. Whatever we call the

primal enabling principle (joy or bliss), most complex living beings seem to exhibit the effects of pleasure and enjoyment, if not to the extent that we do.

Of all species, we seem to have the greatest capacity for experiencing pleasure and joy. Yet, potential, capacity, and intensity are not the same thing. Like pleasure and pain, joy and sorrow are relative. Regardless of how animals and other beings experience joy, we can see and empathize with their expressions of bliss. Therefore, Buddha and veteran Buddhists recognize the essence of joy and blissful serenity as intrinsic to the nature of being and life.

After all, energy science shows us that all living beings are like subfields of the cosmic field of being, the universe. Thus, living beings are natural elements of universal intelligence and life. So, the principle and expressions of joy are also intrinsic to the nature of being.

Medical research of immunity and neurochemistry have shown that joy enhances immunity, and that chronic distress and depression suppresses it. It was also shown that optimal serotonin levels enhance the ability of our mitochondria to protect us (and our DNA, etc.) by neutralizing toxins that make it through the cell wall. Clearly, the goodness and benefits of joy, serenity, and harmony are important realities, essential for bio-ethical axiology and realistic ontology (and ontologists, among others).

Mathematics: Mathematics (maths) is a **a**) field of systematic thought, **b**) a symbolic descriptive language, **c**) a technical discipline, **d**) a practice, and **e**) a science. It is enabled by logical and metalogical principles of being form, structure, function, logical relativity, axiology, and operational semiotics.

Mathematical principles and phenomena are virtual, non-physical, logical, psychophysical, and semiotic. So, its properties make maths descriptive, prescriptive, generative, and operative. They also enable mathematical functions, concepts, systems, complex constructs, communication, interactive applications, operations, and results.

Originally, maths developed as a semiotic discipline that existed for the sake of gaining useful knowledge and wisdom, the understanding of reality. Though maths now seems mostly used for practical tasks and commercial applications, its original purpose survives and drives the development of new metatheory. So, principles of mathematical logic are subsidiary expressions of enabling principles of morphic, structural, functional, and semiotic operational meta-logic. Thus, maths is a subordinate subdomain of metamaths.

Metamathematics: “Metamaths” is the metatheory and metalanguage of the intrinsic metalogical principles and logic enabling and governing maths. It is also the ontology, sociology, and philosophy of maths and its epistemics. In other words, valid metamaths is the metalogical foundation of maths.

Wanting to confirm, expand, and extend the scope and potentials of maths and philosophy, David Hilbert initiated the modern approach to it. Yet, he failed to provide a well-defined foundation of metatheory, insufficient for supporting optimal maths (etc.). Holonomic metamaths deals with the actual nature of maths and the principles that enable it. Holotropic development of holonomic metamaths enables new theory

and metatheory, thus new uses, and new possibilities.

Axiom: “Axiom” is a symbolic label sometimes applied to “laws” of nature or maths, or elements of formulas.

Originally, to the Greeks, an axiom was a definition of a principle or statement about the nature of something that could be trusted as proven true, by long observation and experience, or with logic and/or by practical experiment. In that sense, holonomic meta-axioms have constituents, real semiotic components that express natural principles. They make the symbols, thoughts, maths, functions, and operations possible. Yet, axioms of limited conventional theories have limited validity and potential.

So, we have two kinds of axioms, 1) the provisional axioms of conventional logic, maths, and science; and 2) meta-axioms of valid metalogical metatheory that enable understanding principles that enable “laws” of nature. For example, type 1 axioms enabled set theory and QM-cosmology and their defects, and valid meta-axioms enable remedial R&D.

Theory: Theory, the word, is intimately related to the concept of divinity and theology and gods (more recently, to God). The Greeks of antiquity accepted and used notions of multiple gods to deal with unknown facts of nature and being. Since then, more modern ‘Western’ societies adopted the dominant paradigm of science, society, etc.

Yet, a theory is an aggregation of theorems composed of combinations of assumptions, notions, conceptions, and/or interpretations of data (either observed or deduced). They provide approximate descriptions, speculative hypotheses, and incomplete explanations of actual phenomena, processes, and events. So, truly scientific theory may be upgraded and falsified. Rejecting or trying to prevent effective critiques or upgrades of existing theory or faulty hypotheses is defending unscientific falsehoods or nonsense, not truly scientific theory.

Metatheory: Unlike conventional scientific theories and assumptions, principles, and valid theorems of post-modern maths metatheory are not validly falsifiable. So, as in conventional metatheory, statements of the truths of a holonomic metatheory are proven within its own context, yet also by virtue of pre-existing natural principles.

Principles of natural metalogic are not just concepts or elements of axioms, theorems, or hypotheses. So, holonomic metalogical metatheory (of nature’s enabling principles) is beyond falsifiability. Also, while anomalies and disputability reveal the incompleteness or fallacy of a theory, absence or minimization of anomalies confirms the completeness and validity of a metatheory. Wikipedia gives these interpretations of the meaning of conventional metatheory:

A metatheory is a theory whose subject matter is some other theory (a theory about a theory). Statements made in the metatheory [*of a*] theory are called **metatheorems**. A **metatheorem** is a true statement about a **formal system** expressed in a metalanguage. Unlike theorems proved within a given formal system, a metatheorem is proved within a **metatheory**, and may reference concepts that are present in the metatheory but not the **object theory**.

(Wik 2020-08-24)

For example, new paradigm maths metatheory is holonomic, describing and explaining the basic principles of enabling meta-logic, semiotics, maths, and numbers. Yet, they also enable thought, communication, practical activity, and being itself.

Ontologically, “metatheory” means the domain of discourse and body of knowledge pertaining to the principles and nature of being, forms, structures, functions, operations, and other phenomena. It underlies, supports, and functions beyond the scope of conventional systemic theory. Valid metamaths metatheory enables optimal theorems about actual and virtual phenomena, proof, objects of consciousness (principles, axioms, rules, numbers, geometries, algebras, systems, physics, and so on). Therefore, the holonomic metatheory of science deals with the self-evident logical and metalogical principles and semiotics required.

Understanding metatheory and maths evolves more easily by studying history. Related articles are helpful, especially the article on metalanguage @ <https://en.wikipedia.org/wiki/Metalanguage>

Number theory: It may not seem relevant to a holonomic ontological theory of nature’s enabling principles, but redefining number theory relates directly to the principles enabling all scientific work.

For example, to be valid and viable, number theory must include the basics of numeric logic and semiotics. It must enable better understanding of the nature and potential of numbers, individually, as symbols, and as natural mental and semiotic phenomena. In other words, the only valid, viable number theory is holonomic, a logically whole, self-consistent, and logically complete metatheory of numeric logic, congruent with the actual nature of numbers.

Conventional number theory fails to explain what numbers are, and why and how they are what they are. It ignores the basics, what they relate to, how and why. So, modern number theory lacked a viable logical foundation of valid metatheorems (of metalogical principles enabling numbers and their properties). It also suffered from the lack of a unitive paradigm of science and maths.

Yet, good theory and metatheory of numbers and numeric logic must include all the required basics. Thus, holonomic number theory enables understanding of primal principles of numeric logic, of form, structure, functions, relations, semiotics, and the results. Being based on the enabling metalogical principles of being, holonomic numeric metatheory is completely logical, self-consistent, and holotropic (evolutionary, extensible). It includes the enabling principles of numeric logic. So, it fosters new theory and greater understanding, by integrating theory with enabling metatheorems.

Holonomic number theory is congruent with the actual metalogical principles of maths, next paradigm metamaths, and the holotropic metatheory of logic and science. (*See Science, etc.*)

Proof theory: Modern proof theory was unfinished, incomplete, deficient, disputable, and suffered the lack of a completely defined metatheory of logic, maths, and proof. Thus, many important problems remained unsolved, some for centuries.

That lack of proofs partially proves the deficiencies of former proof theory. In fact, this project enabled realization of 2 mostly ignored elements of metamaths and optimum proof theory: satisfactory explainability and disputability.

Clearly, the greater the degree of a theorem's (or proof's) logical explainability (and intelligibility), the greater its success. Hence, the better the explainability, the more satisfaction, viability, and value provided. Yet, where optimum explainability is lacking, the greater the degree of a theory's disputability, the greater the degree of its weakness and/or failure. Ontological proof theory is holonomic, based on holotrophic metamaths and its enabling metalogical principles.

The principles of meta-ontology's metatheory enable logical and metalogical proofs of maths, and of optimum proof theory. For example, this work uses the principles and methods of optimum proof that enabled explaining the reasons for the historic failure to prove the truth of **RH** (Riemann's hypothesis). With the most powerful "AI" computer systems available, **RH** was and is a hard NP-complete problem that was not solved by economical computation in "P time" (polynomial time).

Another prime proof that $P \neq NP$ is proven by the disputability, defects, incomplete definition, and deficient explainability of modern metamathematics (since Hilbert). Yet, holonomic proof theory enables logical confirmation of the possibility of resolving hard NP-complete problems computationally (in P time). However, that is possible only if the enabling logic, metatheory, and sufficient understanding (of enabling principles) are available to the programmers of the AI system. This work verifies that claim.

Absolute proof: Unlike conventional unconditional proofs and 'finitistic' proofs, absolute proof of a theorem or metatheorem may refer to primordial natural phenomena and primal principles that make it true, and unfalsifiable.

Absolute proofs combine comprehensive logic with definitive explanation and the results of experimental verification. So, a metatheorem may be proved absolutely within the context of a holonomic domain of discourse, as in holotrophic ontology or holonomic metamaths, or in a holonomic metalinguistic metatheory. (see: defs., Theory, Metatheory, Ontology)

Perfect proof: A perfect proof includes definitive, logical, and elementary proof of absolute truth, unconditionally verifying a conjecture, a theorem, or a proof.

Perfect proof is also congruent with natural principles, relevant metatheory, and related theorems. So, perfect proofs can explain exactly why hypotheses, theorems, and proofs are valid or truly viable.

For example, a theorem or metatheorem may be finitistic and truly complete, derivable from and proven per enabling principles, axioms, and holonomic meta-axioms, thus, durably reliable. Hence, perfect proof resolves the whole of a problem. It enables optimal explainability, while eliminating or minimizing disputability. Yet, a perfect proof can be falsifiable, but falsifying it requires foolishness (using logical fallacies, erroneous thinking, etc.).

Elementary proof: An ideal elementary proof shows that a phenomenon or truth is **a**) real or unreal or **b**) does what it does or **c**) does not or cannot do something. Logically (if not comprehensively), an elementary proof verifies basic truths or enabling elements of the subject of a hypothesis or theorem, or it disproves outstanding claims.

Euclid's famous proof—that the possible quantity of primal numbers (the 'primes') cannot be finite—is an example of an elementary (yet non-explanatory) absolute proof.

So, for example, elementary proof that some things or sets of things are infinite may not be disprovable, yet not enable explanation of how and why (they are infinite).

Unconditional proof: An unconditional proof may be elementary, absolute, or perfect, or simply technical, yet may be as falsifiable as any well-proven scientific theorem. On the other hand, a conditional proof is partial proof, with limited viability, not a complete proof of absolute truth, with definite reliability.

So, an unconditional proof (of a theorem or conjecture) derived from an incomplete and/or erroneous paradigm may be both falsified and replaced with a better proof of more effective theory.

Technical proof: A purely technical proof may rely on proven theory and/or conventional techniques. It requires no purely logical, elementary proof, nor any metatheory of enabling principles. A technical proof may be unconditional or conditional (with only partial and/or circumstantial validity). Hundreds or thousands of examples are produced with QM mathematics and QM cosmology.

Technical proofs need not explain or predict anything, and they rarely (if ever) enable better theory and metatheory. Also, they may and often do support obsolete theory.

Finitistic proof: While ignoring the required enabling principles, David Hilbert and his followers did their best to formalize logical terms, rules, and metatheorems of maths and proof. They wanted the best, most logically viable (complete and consistent) foundation of maths and proof.

The assumption was that, to be reliably perfect, proof of a logical truth must completely, formally, demonstrate noncontradictory integrity (of the axiomatic system) enabling it. Otherwise, a flawed or deficient system might never enable viable proof and durable certainty.

However, Alfred Tarski's undefinability theorem (TUT) and Kurt Godel's proof of his incompleteness theorem (GIT) proved Russell, Whitehead, and Hilbert wrong about their project. So, increasingly, modern maths, number theory, and metamaths dropped most of Hilbert's concerns and finitistic ideas. The Quine-Putnam "indispensability thesis" (QPIT) generated renewed interest in fundamental metamaths.

Some important work, new theorems, and hypotheses (of finitism, idealism, realism, naturalism, and holism) were fielded. Yet, as shown with perfect proof (of RH and metamaths), those attempts were neither fully satisfying, nor successful. Indeed, despite all the benefits, Hilbert never fully defined his metatheory, nor its paradigm. Hence, lacking full congruency with propositional logic and enabling metalogical principles, Hilbert's system lacked sufficient integrity, definability, and explainability. That proves the inadequacy of incomplete definition and inherent deficiency.

For the same reasons, modern metamaths, set theory, proof theory, and number theory (etc.) remained unfinished, incomplete, inconsistent (with logic and nature), and deficient. Therefore, they all suffer from refutability and deficient logical integrity. Likewise, defects of metamaths plague current QM physics, economics, and many other arenas of 'applied' science. Thus, without violating either TUT or GIT, this disproof of modern metamaths and pseudo-cosmology is a perfect finitistic proof of holonomic

ontological metatheory and the metalogical principles of nature.

Certainty: In this ever-changing cosmos, uncertainty seems the basic mode of mind. Yet, we normally prefer and enjoy certainty, and the benefits it seems to assure. Thus, good science enables satisfactory certainty, yet only with optimum proof and sufficient explainability.

Death seems to make most of us dislike uncertainty. So, this revised metatheory of maths, proof, etc., includes certainty as a fundamentally essential element of optimal proof theory and metatheory. Clearly, we appreciate science and good theory because it provides satisfaction with certainty. It assures us that new knowledge is valid or, at least, that new theorems are as viable as possible.

Mainstream QM 'cosmology' and Zermelo-Fraenkel set theory (ZFT) prevent arguments in favor of rules that enable satisfactory certainty of results (concepts and provable theorems congruent with reality). For example, because no well-defined metatheory existed before, set theorists decided to settle for theory that relies on notional continuity, selectivity, and the axiom of choice. Of course, that made subjectivity and limited logic superior to unbiased the objectivity, short-circuiting reliably logical certainty.

Yet, validity, value, and maths, its results, theorems, and metatheory depend on reliable, logical certainties. Certainty is enabled by and confirms awareness and, sometimes, validity.

Of course, a belief in or sense of certainty may be an illusion or delusional. So, valid certainty is a prime motive of science, maths, and proof. So, certainty requires actual congruency, making it indispensable for certainty and proof. So, both are key necessities for the logical integrity of metamaths, maths, and proofs in accord with reality.

Falsifiability: Viable valid scientific theory must not only be verifiable but also falsifiable, because the nature of universal being is transfinite.

Everything constantly changes, except for principles. Being beyond knowing completely, actual and virtual phenomena may be recognized and understood, but not fully described. Thus, to be congruent with reality and reflect the natural actualities discovered by new and/or better observations, good theory must be evolutionary, upgradable, and refutable, thus falsifiable. Unfortunately, most pop-stars and fans of modern metamaths, cosmology, QM physics, and astronomy ignore their rejection of falsifiability and refutability. That prevents progress and resolution of the SM's current crisis.

So, natural phenomena now challenge cherished SM assumptions, misconceptions, and misinterpretations (of observed phenomena). So, observed phenomena and data keep disproving the basics of current standard model theory. Yet, SM believers do all they can to protect and preserve the incomplete foundation of existing theory (with ever more excuses and wilder speculations). Clearly, refusing to recall the necessity and importance of falsifiability and refutability of valid scientific theory is a self-deluding abuse of science.

Of course, it does help to perpetuate confusion about the basics, which helps perpetuate enjoyment of wrangling over theorems, hypotheses, and conjectures that lack and/or prevent optimal verifiability, certainty, explainability, validity and/or completely

logical provability. For though valid tautologies and metatheorems (congruent with principles of natural reality) are not effectively falsifiable, proving them and using them to prove theorems of subordinate logical systems makes falsifiability an essential element of metamaths. So, falsifiability is a critical element of meta-ontology and holonomic proof theory.

Provability: Provability is a key principle and necessity of good science (and maths). Good theory is a description of phenomena or enabling processes (or a definition of concepts and claims) that can be tested, verified (proven), and explained for generally satisfactory certainty of truth, being congruent with reality, nature, and/or logic.

Therefore, realizing that a theorem or hypothesis is or is not provable is critically important (to avoid retarding or preventing progress). Hence, especially for determining computability, decidability is critically important for proof and certainty.

An unprovable set of statements or axioms fails to provide any certainty of validity, hence failing to qualify as a viable theory of science (or maths). Even in the domains of metatheory, where metalogical tautologies are valid—to be considered well-defined, acceptable, and viably explainable—the elements of a metatheorem must be congruent with natural reality or, at the least, perfectly logical.

Sadly, SM QM and modern cosmology make illogical theorems, misperceptions, and fantasies about impossibilities seem like acceptable science. So, the deficiency of provability and a vast number of disproofs (AKA anomalies) make SM ‘cosmology’ a perfect example of why proof and provability are essential for good theory and science.

Definability: Einstein realized that the best understanding enables the best theory, the best proof, and the best explanation. They all require and enable the best definitions of terms that, ideally, they represent valid concepts and actual phenomena.

Thus, definability, the principle, enables the best theorems, metatheorems, proofs, and proof theory. For example, post-modern metamaths enables and is enabled by necessary definitions of terms that enable description and optimal explanation of the elemental principles that enable maths and universal reality, the actualities of being. Hence, holonomic metamaths is able to correct the deficiencies that caused the failures of the pioneers of modern metamaths. Those deficiencies were caused by inadequate definability of the pioneers’ terms, axioms, theorems, and metatheory. So, completing the pioneers’ programs was impossible.

Lack of definability was clearly due to insufficient recognition and understanding of elemental principles, making the necessary foundation of metatheory an impossibility. Clearly, without optimum definability, sufficient explainability of metatheory and proof theory are impossible. Including the definitions of the enabling principles of maths and reality lets holonomic metamaths restore and fulfill the original purpose of maths: the development, study, discussion, knowledge, and understanding of universal reality, valid theory, and proof (for satisfactory certainty). Hence, holonomic metamaths enables better maths and science. (see defs., Falsifiability & Regularity)

Explainability: Inherently, good explainability indicates validity or adequacy and reliability; and it can support satisfactory results, certainty, and acceptability. It also tends to prevent or minimize objections, doubts, disputes, and disproof.

So, teachings, theorems, and assumptions that lack optimal explainability may lack value and necessary sufficiency, proportional to lack of validity or viability. In the fields of education, logic, maths, metamaths, engineering and other technical disciplines, any deficiency of theory or metatheory that hinders optimal explainability is unsatisfactory, and dangerous.

Explainability is clearly a key principle and element of the metatheory of science, maths, logic, and proof. It is therefore indispensable to good science and any theoretical work of real value and importance.

Acceptability: Acceptability is a fundamental principle of maths, metamaths, physics, valid theories, and definitive proofs. It should be considered essential for effective teaching and communicating valid information.

Unfortunately, acceptability can also seem to be an option, a variable quality of something that may lack validity or real value. So, some accept baseless opinion, erroneous assumptions, and lies because of deluded ignorance, irrational habit, or confusion (etc.). So, that kind of acceptability can and does cause or foster general acceptance of deficient or defective theory, bad science, and worse.

So, for science and proofs, acceptability must only be conceded when proven by validity, certainty, sufficiency, natural congruency, and optimal explainability.

Reversibility: Though not always available or applicable, some proofs of mathematical results or processes are verified by reversibility, the principle.

For example, a system or algorithm or a functional process that always produces valid results in reverse can be considered functionally reliable. In fact, as long as an operator or mathematician uses a functional formula or procedure properly, it can only produce the results enabled by the principles that enable it. The prime example is the arithmetic progression of positive integers, from zero to infinity, by adding one to each preceding sum. Of course, with subtraction, the process can be reversed from anywhere along the number line. A more impressive example is the Collatz “hailstone cascade” algorithm (CCA):

Starting a sequence with any integer n , if the next integer is 1, the process stops. If the next integer is even ($2n$), then divide by 2, but if the second integer is odd, multiply by 3, then add 1. So far, for every starting n of up to $\approx 2^{68}$ (about 300 quintillion), the process always ends with 1. Naturally, if you reverse the process (RCC) at every step, starting from 1, it always gets you to the right number that started the “forward” process.

Evidently, so many mathematicians are amazed and mystified by that, they see no acceptable proof of Collatz’s conjecture. Essentially, he guessed that his algorithm would always work for any positive integer, no matter how large. However, the process is more easily understood by thinking of it as reductive going “forward” (and down). In reverse, we can think of it as productive or expansive. We can also consider the reliability of arithmetic, progressions, addition, subtraction, multiplication, and division.

However, seemingly, previous investigators failed to consider the principles that enable and ensure the reliability of arithmetic, its functionality, and its basic operations. So, the CCA and RCC verify reversibility as proof of functional reliability. They prove that a vast majority of highly educated, very talented mathematicians can be unaware of

the basics (the logical principles) enabling maths, its results, and its potentials.

That shows how falsifying or disputing valid theory, metatheory, and proof demonstrate foolishness ignorance, while confirming the reliability of the principle of permanence.

Disputability: Disputability, the fact or condition, is normally caused by **a)** lack of validity or certainty, **b)** deficient explainability, or **c)** faulty logic, **d)** doubt or ignorance. So, disputability, the principle, is an important element of holotropic metamaths, logical analysis, and proof theory. (see def., below)

Even using common logic can enable and require disputability. Clearly, mentality, intellect, sanity, reason, and truth enable insight or intuition and knowledge that support agreement and/or acceptance of the validity or realism and adequacy of an assumption or claim. Also, knowledge and reason or intuition may cause doubt or suspicion, or curiosity that supports the disputability of a questionable assumption or claim.

So, despite their many benefits, the various versions of modern metamaths, especially Hilbertian formalisms, and the many questionable assumptions and claims in the complex of debates on the Quine-Putnam [Indispensability Thesis](#) are all perfect examples of theory and metatheory infested with inadequacies, thus disputability. Hence, optimal explainability and viability are lacking. That justifies intuition or suspicion that necessary validity and logic (sufficient for unconditional proof) are absent.

Another example: This project enabled proof that SM number theory suffers disputability because of inadequate numeric metatheory, insufficient logic, and deficient explainability.

Intelligence: Essentially, intelligence is a mode of agency, and agency is a functional principle of being and identity. The nature of being (its intrinsic enabling principles, properties, qualities, and potentials) enabled and sustains life and, therefore, its expressions and modes of agency, sentient awareness, and cognition. So, however primitive or seemingly simple, all beings and forms of being exhibit natural intelligence, at least as an enabling property or potential.

For example, healthy cells, mitochondria, and RNA exhibit primitive yet intentional agency, effective responsiveness, and purposeful behaviors (triadic coding, decoding, protecting, etc.). It seems only a passive database, yet DNA's elemental morpho-structural logic embodies and expresses quaternary bio-semiotic code. Of course, we have no reason to doubt that DNA-RNA intelligence, agency, and semiosis are limited only to biochemical coding. Their molecular structures can be thought of as somewhat like resonant bio-luminescent transponders or antennae, receiving and transmitting information at many EM frequencies (at near light-speed).

Clearly, that begs a big question. Where is the separation or difference (if any) between the intelligent agency of DNA-RNA (and life) and ours? The best answer seems to be that that is the wrong question. Life's elemental subcellular intelligence and human being are inseparable. The main difference seems to be that ego's socialization can enable stupidity.

So, stupidity is the opposite of wisdom, not of intelligence. Wisdom is the realization

of the potential of life's intelligence. Subversive social programming and biochemical emotional conditioning can limit and pervert our intelligence, agency, and wisdom. Fortunately, being seems to favor wisdom (and eliminate excess stupidity).

Awareness: Awareness is a principle and the essential expression of mentality, the principle. Primal principles of being make the presence of awareness integral and universally pervasive. Without awareness, perceptions, appearance, and knowledge, information would be impossible. Awareness enables intelligence, understanding, and intentional response, however simple.

Understanding the basis of awareness helps us understand the nature of perception, consciousness, intellect, and reality. We may then understand the depths and results of science, maths, logic, and intelligence. Awareness is the primal essence of consciousness and perceptive cognition. Understanding awareness and the primal logic of mentality permits realization of the interdependently nondual nature of subjective perception, cognition, and objects of consciousness. That understanding enables realization of the psychophysical nature of our self-world constructs. That permits awareness of the inseparability of fundamental principles and the phenomena they enable, empower, and sustain. (re: def., Intelligence)

Consciousness: It is a functional principle and property of mentality. So, understanding the nature of consciousness is a necessity for fully understanding physics, relativity, QM, and reality, yet it seems to remain mysterious, confusing, and insufficiently defined.

However, without a valid, viable, generally satisfying definition and explanation of consciousness, the anomalies, uncertainties, futile arguments, and deficiencies of modern physics and cosmology will keep limiting physics and society. Now, despite contenders who play at defining and explaining consciousness (without any foundation of elemental enabling principles), we can admit that consciousness is a property of sentient being, enabled by the actualities and potentials of awareness and mentality, the principle.

Naturally, awareness, sentient intelligence, knowledge, and consciousness are enabled by and express the nature of mentality, an intrinsic metalogical principle of being. Thinking that awareness, intelligence, consciousness, and thought are only products or expressions of physical or physiological functions and processes is simply foolishness. Clearly, like physicality, mentality, identity, personality, intentionality, and the other natural principles enable a) mind and sentience, b) subjective consciousness, c) observation, and d) objects of conscious perception.

So, awareness is the interactive essence and expression of mentality; and consciousness is the condition of sentient intelligence. It expresses the intrinsic metalogical principles and properties of mind and mentality. The actual, nonphysical principles of being enable the physical and biological embodiments and/or expressions of consciousness. Reversing that metatheorem would imply the existence of an *a priori* but, as yet, undiscovered material or physical process that magically produced living, perceiving, sentient beings, thoughts, and intentions. However, no magical mind-making substance or physical objects or process could ever cause mentality or minds.

Because the principles that enable all substances and minds are enabled by other

metalogical principles, they determine their functions and potentials. The nature of being, form, structure, functionality, interactivity, energy, and all its universal embodiments and expressions of reality (U_R), enabled U_R and the nature of life, as is, long before planet Earth existed. Since then, because of their nature, the primal principles of U_R have never changed its nature or the nature of consciousness.

Nonphysical principles have nothing to change, and they never enabled anything else that could change them. Physical processes cannot change nonphysical principles that enable matter, energy, events, and consciousness of transient conditions. Otherwise, there could be no finite forms, durable structures, characteristic properties and functions of life, entities, things, places, and no sense of time. Yet, reliably durable elements are intrinsic to the field of being and consciousness.

For example, science has discovered molecular evidence of life in the outer reaches of the heliosphere (this solar system) and far beyond. That supports the possibility of biological life being intrinsic to being-as-a-whole, throughout the universe. Also, in even the most primitive forms of life—prions, virions, viroids, archeo-bacteria, and tardigrades—we see the basics of purposive intentionality (a subsidiary principle and property of mentality). In fact, the species of [microscopic] tardigrades can revert to a spore-like form that survives intense high-energy radiation outside Earth's atmosphere. Hence, we can admit that a species of being with any awareness of the field (of being, and its '3D' dimensionality of local 'space') proves that even primitive expressions of intentionality demonstrate:

1. expressions/embodiments of mentality
2. forms/modes of subjective awareness, and
3. consciousness, however limited or unrecognizable

In our human case, we can understand apparently impossible mental phenomena as the evidence of our possibly limitless potential capabilities. In other words, the potentials of human mentality may be as limitless as the potentials of universal being, its mentality, creativity, energy, and power. After all, all properties, processes, and potentials are enabled and sustained by (and belong to) being, its universe, and its nature. So, for example, pre-mortem and post-mortem OBE's (out of body experiences) and accurate clairvoyance (visions and precognition of actual future events) can be understood as naturally generated potentials of consciousness, enabled by the intrinsic potentials and properties of energy, enabling meta-energy, universal intelligence, and mentality, the enabling integral principle of mind and identity.

Thus, we can accept that the intelligence and consciousness of mind and DNA can exist without, before, and after living brains and bodies. We can see that proven by research enabling progressive understanding of mental functioning by using EM sensors placed on (outside) the head. They detect patterns of EM field-effects caused by the brain's activity. Yet, like $\pm 96\%$ of the cosmic field (its hyper-luminal energy AKA 'dark' energy), we cannot directly detect the presence of the mind's field of meta-energy.

Still, we can study the patterns of EM emanations and local field-effects of mind (awareness, consciousness, thinking, etc.), enabled by neural functioning, enabled by intrinsic metalogical principles and properties of mentality. Hence, we can come to understand the meanings of the patterns and meta-energy enabling the whole of being (the cosmos). Thus, we should accept OBE and precognition as natural evidence of the

pervasive intelligence of the field of being and its nature.

They also prove that 'mind' is not simply a 'physical' product of 'normal' biochemical, physiological functions (of a 'living' body), but an intrinsic potential of universal reality. So, we can be sure that the existence of consciousness is an inherent expression of the intrinsic potentials of mentality.

Mind: Mind is a word, a symbolic concept that refers to our ideas about phenomena enabled by the principles of mentality (etc.). Yet, mind can be considered a principle and property of being (the cosmos). For example, we have minds, and we exist as embodied expressions of being (and its nature, "in" the universe).

Therefore, mind is a principle and/or property of the nature of universal being. However, depending on our social conditioning and internal or external factors, the nature and properties of mind can seem mysterious or dubious. So, many modern people fail to think of mind as an integral mode of being, intrinsic to the nature of the cosmos.

Yet, the reality of intelligence—as a potential of universal being—is self-evident, beyond serious doubt. DNA and the purposiveness of RNA should inspire certainty that mind is enabled and sustained by nature, the greatest of all coders and communicators. Clearly though, many modern materialists and religionists maintain excess confusion.

In ancient Asia, some thinkers realized that perception and cognition are inseparable, and that concepts and perceptions are interdependent. They also realized that the nature of mind and body is beyond what we think of as physical reality. So, they realized that the nature of mind and the nature of reality (the cosmos) are nondual, not separate.

Some Buddhists then came to think of our mental faculties as being somewhat like our sensory faculties, a more subtle 6th sense. However we think of it, mind is clearly an expression of being, enabled by DNA+RNA and their natural enabling principles (including mentality).

Being: The universe (all phenomena) and being are not separate events. Beingness is the essential expression of actuality, the most essential enabling principle of its nature.

Being's nature is **a**) its intrinsic metalogical principles, **b**) subsidiary enabling principles (such as physicality, etc.), **c**) its qualities, **d**) its properties, and **e**) the processes that enable it (being). What exists is being; and what is not a part or form or process of being does not exist.

For example, nonphysical qualities and enabling principles are actual elements of being, so they exist. Thoughts, assumptions, theories, fantasies, dreams, illusions, and delusions exist (as nonphysical phenomena), but the unrealities perceived or believed do not exist. An important quality of being is its liveliness, energy, and action. By considering the whole of reality (the cosmos) as the presence or "field" of being (not mostly nonexistent emptiness + little bits of mysterious energy/matter) we can understand its liveliness as all pervading.

We can understand being because its intrinsic enabling principles of being empower and sustain its energy, properties, qualities, and potentials, including mentality and the existence of life—intelligent beings, species of beings—and constituent forms of being (mitochondria, viroids, DNA-RNA, proteins, elements, etc.). For example, the nature of

being enabled human being as an embodied expression of its nature and potential. So, we can understand it because being enabled our awareness of it, its nature, and its potentials. (see the defs. Of Mentality, Awareness, Nothingness, etc.).

Nothingness: For viable macro-ontology and meta-ontology, nothingness is an important logical principle. Yet, its actuality does not exist in any nondependently physical way. As nonbeing, “nothingness” means that which does not exist. As a condition of absence or lack, nothingness is knowable only relative to something or everything that exists.

Obviously, what does exist is everything, the totality of what exists, the universe. So, even what seems to be empty ‘space’ is indirectly detectable hyper-energy that enables, interacts, and moves with ordinary plasma, cosmic currents, galaxies, atoms, etc. Hence, nothingness and all symbolic representations of it exist only as psycholinguistic or psychophysical phenomena.

Life: 1. Life is a primal principle and property of being, intrinsic to its nature, the whole of its complex macro-ensemble of metalogical principles. That makes life an intrinsic, elemental potential of being, the infinite totality of universal presence. 2. Life is also embodied and expressed as and by living beings, from the simplest, most primitive, to the most complex, us.

Naturally, life is the principle that enables the integral interdependence of all the metalogical principles that enable living beings, their biomes, cultures, and their interactions. Of course, that theorem implies the interactivity of physicality and mentality, presence and awareness (body, mind, etc.), stimulus and response. Even the lively interaction of the most primitive beings, even viroids, and their micro-biomes express the nature of life. So, we can safely say that expressions of liveliness, vitality, and viability—however brief or simple—are characteristic of life and living beings. That pertains to the liveliness of mental activity and perceptive acuity and responsiveness. Hence, thinking of “the life of the mind” and “a lively exchange of ideas” are valid expressions and examples of lively mental activity and its enabling meta-energy. Life, liveliness, living beings, energy, and activity are intrinsic elements of being and the whole of reality as much as physicality and mentality.

Bio-ethics: Natural bio-ethics came before ethics and morals. Remember, prior to 2 million years ago, our ancestors were good learners. Learning that good and bad choices and actions cause good or bad results was clearly a helpful evolutionary development. Archeologists and paleo-anthropologists found evidence of spirituality and religious traditions of people who lived more than more than 200,000 years ago.

We also have solid proof that our earliest humanoid ancestors enjoyed successful, cooperative hunting and gathering. Their infants clearly enjoyed the loving care of devoted, empathetic mothers and fathers, pair-bonded couples—freed of constant conflict and competition for mating rights and dominance. So, more than 3 million years ago, human culture was succeeding because of **a)** empathy, **b)** consideration, **c)** our unique physiology and our neurochemistry, and **d)** the enabling principles of nature.

Obviously, all that required the prior development of natural ethics, intrinsic to our whole way of doing to being human. Later—more than 150,000 generations later—our

ancestors related natural phenomena and forces to mystic, supernatural causes and possibilities. We see that fact proven by the most ancient cave paintings and the logical semiotics of our pleistocene forerunners. In fact, the extremely durable legendary histories of the most ancient indigenous cultures (of Australia, North America, and Africa) confirm the reality of intrinsic bio-ethics that sustained the respect for nature that sustained them.

That also lets us see that the more systematic, formally codified ethics and moralism of urban civilizations were not only much more recent, but much less successful, much less supportive of adaptive sustainability. Of course, China seems to offer a counter-example. Yet, its current version of kleptocratic imperialism shows no signs of multi-millennial sustainability.

Clearly, the root cause of social decay, declining quality of life, and self-destruction that ended all earlier civilizations involved anti-ethical, normalized mass-psychosis. In other words—as people became less connected with nature and each other—egocentric consciousness, natural values, and intrinsic bio-ethics were subverted or superseded by increasingly a) perverse egoism, b) artificial values, and c) exploitive moral systems that served the ruling elites.

So, it seems that the recent resurgence of interest in bio-ethics, so fiercely resisted by regressive elitists (and their unwitting victims), is a direct result of the deficiencies and perversities of kleptocracy's anti-natural, self-doomed pseudo-moralism. Indeed, global evidence of the malignancy keep accumulating as the destructive process accelerates. Of course, as in previous cycles of decline, ruin and destruction accelerate exponentially as sociopolitical and socioeconomic dysfunctionality increase.

For instance, the toxic effects and increasingly destructive climate destabilization this civilization's ruinous impacts are already increasing at exponential rates. Still, despite PR hype and official rhetoric about the promise of AI, so far, the vast majority of its uses and development projects serve superior surveillance, better marketing, higher profits, and better exploitation of disinformed consumers. The fact that AI has not reversed the general corporate management strategy of "functional stupidity" provides proof that the GIGO (garbage in, garbage out) rule of computer science still rules.

Thus, instead of using AI to reverse civilization's decline and biocidal impacts as rapidly as possible, AI now accelerates the process. That the above truths are generally unknown or ignored—and that appropriate global emergency response is generally refused, while destruction accelerates—proves that deficient bio-ethics dooms defective societies.

Morality: It may be a subsidiary principle of society, enabled by humanity, but ideas and beliefs about morality prove mass-confusion.

There may be as many versions of morality and moralism as there are social groups and individuals. So, optimal bio-ethical science and praxis require deconstruction and de-confusion. Still, confusing rhetoric and disinformation are so pervasive, detangling the truth from fictional opinions may seem an overly gigantic task. Yet, being principles, the nature of both morality and ethical integrity makes resolution fairly simple.

For example, being a highly complex social species, activity, causality, and our natural limitations make us subject to the consequences of our choices and actions. They also determine our quality of life, our personal and cultural wellness and joy, or illness

and worse. So, over thousands of generations and millennia—as cultures developed, rose, declined, and fell or were wiped out—most human beings and families came to understand the interdependence of personal and cultural wellness. In other words, our natural preferences—for life, wellness, joy, pleasure, harmony, and prosperity—tended to cause ever greater interest in the causes.

Gradually, cultural learning and natural selection favored the development of more effective bio-ethical wisdom traditions, then ever more complex systems of religious moralism, theology, dogmas, and arbitrary social norms. So, evidently, countless cycles of disaster, atrocities, genocidal war, and regressive, increasingly systematic tyranny caused chronic, multigenerational traumatic and post-traumatic distress syndrome. That led to the increasing my poems systemization of exploitation, mass-indoctrination, mass-confusion, systemic corruption, and moral decay that was increasingly automated by the industrialization of neo-feudal imperialism.

Now, obviously, nothing could be more important than understanding the nature and ways of anti-ethical socioeconomic manipulation and exploitation of cultures, the sciences, education, and moralism. So, that, and finding remedies, is a core value and aim of holonomic, realistic ontology.

Strange attractors: Like ‘dark’ stuff, and other SM anomalies, the label “strange attractor” is a verbal landmark proving ignorance, misunderstanding, and deficient theory. For example, some regions of the universal field ‘look’ dark and totally empty, being very far from all galaxies and galaxy clusters. However, some seem attractive, with very high temperatures.

All that heat ‘normally’ indicates energetic activity and massive SM matter. Yet, SM physicists are as baffled by that anomaly as by the thousands of others that disprove their pseudo-theory. Obviously, the only things that attract anything or anybody are pheromones and other signals for facilitating mating, hunting, and sale of products. That is so because all flow phenomena of the MDE^∞ field of energy and hyper-energy are best understood with terms that best describe the fluid dynamics and enabling fluid mechanical principles that make it all possible (and visible as fluidic phenomena). High ‘pressure’ regimes/regions are not attracted to lower pressure regions/regimes, because they are not separate things or isolated events/processes.

Fluidic flow phenomena are inseparable field-effects of the field and subfields of interdependent MDE^∞ energy and hyper-energy. That is as true of magnets and hydraulic processes as it is of the whole of the cosmic field of being. So, the basic assumptions and interpretations of obsolete theory are simply invalid (thus, terminally deficient). The hyper-plasmonic modes of the field of energy and hyper-energy are constantly sustaining a responsive ‘push’ of co-emergent energy. That enables detectable forms, modes, and effects of energy that are recycled back into the hyper-frequency modes of the circuit. (see defs., Energy & Matter)

However, in SM pop-sci media and mainstream literature, we see little or nothing about those apparently dark, colossal regions of intergalactic MDE^∞ field phenomena. Likewise, we now see little or no work on the huge cosmological constant problem, despite ever-increasing evidence provided by all the heliospheric, galactic, and extra-galactic phenomena discovered via new astronomy. Now, doing real scientific work (mentally, empirically, theoretically, and experimentally) requires courageous

exploration and investigation where no modern QM theorists dared to go: into the realm of truly holistic science.

On the other hand, the recent Nobel prize for using maths to confirm the possibility of 'Black Holes' proves the degree of confusion and decline of the paradigm of modern science and society. Of course, there are CGI images of data that seem to show evidence of black holes in galactic cores. However, the associated data and images could just as well be seen and understood as a phenomenon in the center of axial galactic vortices. Also, with fluid dynamics, a torodial or quasi-spheroidal cosmic vortex of a maturing 'strange attractor' can be equally easily understood as a pre-luminal embryonic nebula. (see defs., Galaxy & Black Hole)

Yet, heat requires causes, interacting subfields, varying rates of flow, and the effects of turbulence (etc.). Obviously, the cosmos is the totality of such phenomena (and their energetic emanations). It may be possible that the spin of the whole cosmos interacts with the different rates of motion of its hyper-luminal and luminal subfields (another possible cause of seemingly strange cosmic heat).

Black Hole: Like the Big Bang hypothesis, the Black Hole hypothesis was caused by SM QM maths, materialistic assumptions, misinterpretations, antique beliefs, deficient linguistics, subverted ontology, and misunderstandings (re: time, space, energy, nature, reality, maths, etc.). In other words, the fact that maths is sometimes used to describe real mechanics of being (etc.)—such as the cosmic effects of energy's electro-magnetic and kinetic forces (EM_F+K_F), planetary motions and orbital trajectories—does not mean that whatever mathematicians think about their model approximations, probabilities, and QM statistics are natural realities. Nor do QM maths and SM presumptions excuse or justify abuses of logic and science.

Yet, clearly, believing in conjectures (educated guesses) about: **a**) an unknowably impossible point that suddenly appeared from nowhere & nothing—before being, energy, and causes existed—then turned into everything (mostly empty space & 'dark' stuff), as an ongoing explosion that keeps accelerating, and/or **b**) that causeless, hyper-tiny particles of QM material can have a supernatural power that causes gravity enables believing in almost anything, no matter how ridiculously unreal it is.

For example, they should know that EM_F is 10^{39} times stronger than G_F (gravity), and realize what that means (re: cosmic form, structure, functionality, etc.), but QM gurus and fans believe that gravity rules physical reality. Of course, that is another result of ignoring other inconvenient truths of the cosmos. So—instead of seeing and realizing the nature of all the **a**) ultra-colossal EM_F+K_F flow phenomena, **b**) hyper-dense plasma & hyper-plasma phenomena (all the 'dark' hyper-luminosity, radiation pressure, compression, etc.), and **c**) the enabling principles of hydrodynamics and fluid mechanics (enabling, empowering, and sustaining the ultra-colossal effects at and surrounding the centers of galactic vortices)—QM cosmologists and apologists focus of the results of statistical maths. Of course, that supports their interpretations of their approximal models and fantastic probabilities (that have little or nothing to do with cosmic reality, realistic physics, and good science).

Now, despite axial dual-vortices spanning billions of LY (billions of trillions of miles, sometimes aligned with several other galaxies' axial vortices)—among thousands of other rapidly increasing "anomalies" (disproofs)—the gurus and fans of deficient QM

cosmology insist that their abuses of maths and science guarantee the existence of Black Holes (in mysteriously empty yet ever-more rapidly expanding, yet still ill-defined, geometric yet impossibly curvy space-time). Of course, to the victims of such defective logic and faux-science, this critique could seem overly harsh or simply unrealistic.

However, a bit more evidence should eliminate residual confusion and misplaced trust (in SM QM cosmology, Black Holes in maths, etc.). For instance, we see and hear Black Hole lovers talking about everything but the enabling principles, properties, and actualities of galaxies. Of course, we also never see actual evidence of a star large enough to gobble up a galactic-scale subfield of the unified field of universal being (and its energy, etc.). Nor do the Black Holers have a single shred of raw data proving that even one galactic-scale super-star ever existed. What they do have is their misinterpretations of observations and data (re: phenomena ruled by the magneto-dielectric (*MDE*) nature of the energy of being, *i.e.*, the cosmos).

Clearly, believing in or maintaining cosmologically fictional Black Holes in a QM maths fantasy of empty probability-space, requires ignoring the almost inconceivably vast energy (and the totality of EM_F+K_F of galactic phenomena) empowering and sustaining **a**) galaxies, **b**) their central axial cores of concentric ultra-high-energy plasmas and hyper-plasma vortices, and **c**) the magneto-dielectric currents that carry galaxies, galaxy clusters, and galaxy super-clusters across many billions of LY (to macro-anodic destinations in the “field” of MDE^∞).

That ultra-colossal ignorance and belief in pseudo-scientific QM-cosmology also enables and temporarily supports believing that phenomena (explosions, etc.) enabled by physicality and other principles are present without causal factors and enabling principles of being (its nature). That is clearly absurd, unrealistic, and anti-scientific.

Red shift: The currently dominant interpretation of cosmic “red shift” is an illogical invention. It requires only belief that an expansion of nothingness from nowhere can accelerate forever for no reason. Despite such popular shibboleths, like Pasteur, Edwin Hubble came to doubt what became the popular interpretation of his most famous result (the constant of cosmological expansion).

There are 2 main alternatives to the anti-theistic materialists’ supernatural notions of cosmic existence: 1) an upgrade of Feynman’s “shrinking universe” hypothesis, and 2) the dynamic, post-Prigoginean paradigm. Like the original Feynman hypothesis, its upgrade includes both entropic loss of mass and negentropic replacement (with a greater number of smaller units), yet also the dynamic interactions of “light” with the intervening subfields (of light, etc.) between us and distant sources. Option 2 makes shrinking and expanding unnecessary by acknowledging the interactive nature and potentials of **a**) the field, **b**) its countless interactive, interpenetrating subfields, and **c**) the dynamic effects (forces).

In other words, per scenario #1, the wavelengths of light streaming away from very distant sources (as spheroidal wavefronts) seem to indicate receding distance because of **a**) gradually decreasing energy of the sources and **b**) losses due to interactions with the many subfields of **E** along the way. In view #2 (the holonomic view of reality), changing wavelengths and frequencies of spheroidal emanations of **E** (“light”), streaming away from sources, are caused by **a**) ongoing changes at the source and **b**) EM_F+K_F phenomena (changes) across the many interacting, interpenetrating subfields (of the cosmos).

Of course, view #2 is supported by observed effects of hyper-luminal hyper-plasma ('dark' energy/matter) on the elemental energies (and light) of galaxies (among other things). That makes this another disproof of QM cosmology's excess anomalies (*i.e.*, illogical absurdities), validating macro-ontology.

Fields: The term, though generally confusing, can be useful, as long as we recall that it relates to a vague analogy for a property of being. So, "field" can refer to mental constructs and objects of maths, theoretical physics, and plasma physics. The field of energy some call "the vacuum" (or 'space') has magneto-dielectric properties. We can be sure of that because most of them were discovered, measured, tested, and described more than 100 years ago.

For example, the intrinsic principles enabling the field and its field-effects give it some properties of conduction, resistance/insulation, impedance, permittivity, potential (energy), and other qualities common to materials required for electro-magnetic phenomena. Yet, nothing lacks existence and properties. So, clearly, the field's magneto-dielectric nature and properties prove it something other than nothingness.

However, a field of wild grass may be more like an interface between subfields of the cosmic field $\{MDE^\infty, E_{em}\}$ —of magneto-dielectric and elemental-material energy—than the SM models or an EM 'field' of a magnet moving in Earth's E_{em} field. It may be an accident of sociolinguistic limitation and deficient epistemics that "field" was chosen to label what may as well be seen as a vast sky-ocean of energy. Yet, confusion also seems to come from being somewhat like fish or birds, who never see the medium in which they live and move. However, as long as we bear in mind that the term (field) is an arbitrary label (not what it labels), it will not confuse us.

For example, science proved that energy gives form, structure, and functionality to everything—to us, and to everything within and around us. Consider the solidity of ice and the ocean's fluidity, and the supra-fluid form and functionality of high-temperature steam—the energy, hyper-energy, and meta-energy of the universal field of being enables and sustains all those forms and modes of energetic matter. It does so without isolated subatomic points of magic and maths. The meta-physicality, hyper-liquidity, and meta-gaseous hyper-plasma that fills $\pm 96\%$ of being's quasi-spheroidal vastness needs no spooky maths.

In other words—like Earth's ocean and sky, the sun's sky, and the galaxy's local sky and beyond—the universe is a unified supra-fluidic field, enabled and sustained by its intrinsic metalogical principles. Coincidentally (not accidentally), we see that reality in the forms of cloud-like nebulae and the many forms of vortical field-flow above and below galactic cyclones of plasma and stars (etc.). The temperature, solar weather, and radiant flow we see at the interface we call the sun's photosphere and corona give us actual evidence. The corona is nearly 5 times hotter than the 'surface' because the extra-solar pressure gradient enables that much more activity (vibratory interaction), radiance, luminous and ultra-luminous emanation, and bidirectional flow events.

In fact, the colossal fluidic (ionic) 'mass' ejections and streams of plasma (magneto-dielectric double-vortices, etc.) keep accelerating as they speed away from the sun, towards the 'local' planetary subfields, to the fringe of the "heliosphere" (the solar sub-field) and beyond. Regardless, SM QM cosmology makes the reality impossible, because

1. G (gravity) rules SM astrophysics, and
2. empty SM ‘space’ cannot support electricity, and
3. a SM sun only creates magnetism, not electricity, and
4. SM cosmologists ignore the inseparability of EM events, and
5. they refuse to revise their SM beliefs, assumptions, theorems, etc.

Yet, in spite of the mainstream SM QM cosmologists’ belief system—and because of its very reliable enabling principles—the $\{MDE^\infty, E_{em}\}$ field and the sun keep doing what they do. Why and how do they do so? Because the further from the sun, the less turbulent interactions to slow the flow, and the more focused the EM driving force of the magneto-dielectric response (of the field).

Also recall the vast difference of magnitude and amplitude of the EM force [at $\approx 10^{39}$ times greater] compared to G (the gravitational effect); also, at 0°K , the $\{MDE^\infty, E_{em}\}$ field’s “Planck energy” density (D_{EP}) is $\approx 10^{113}$ greater than ordinary matter’s D_E and, so, combined, that gives us

Eq. 0: $(MDE^\infty, E_{em})E_{EMF} + E_{PH} \geq 10^{152} > G$

Yet, it seems reasonable to wonder about high-energy rays, ions, and electrons. However, as explained above, we see what may look like spheroidal particles of light because atoms and other super-/ultra-/hyper-miniature plasmoids have photospheres, coronas, somewhat like those of stellar plasmoids. Yet, those are field-effects caused by local activity and densities of resonant pressure gradients, interactive flows, turbulence, and luminous interference patterns. So, we can think of them as being somewhat like omni-dimensional, animatronic holograms, projected from each vector of emergent force (within their elemental spheroids and vortices), energy, and hyper-energy.

Where does all the field’s vast energy and power come from? It comes from everywhere and beyond (the meta-energy mode of the field and its hyperactive potency).

In other words, energy, force, and power are expressions of the intrinsic metalogical principles that enable and determine the properties, forms, functions, and potentials of the field, its subfields, and field-effects at all scales. So, we can now understand the realities enabling thermonuclear fission, explosions, implosions, and fusion as results of either – a) disruptive, disintegrative destabilization of internal and external flow regimes, and/or as results of naturally occurring plasma flow and super-compression.

Yes, resonant vibratory modalities and pressure gradients normally sustain the characteristic forms, structures, functions, and interactivities of the elements, in their native ‘rest’ states. For example, the more reactive or massive and complex the form, structure, internal functions, modes of flow, vibration, and interactions of an element’s nuclear ensemble (of plasmoid nucleons), the less it can resist disruptive field effects. Thus—relative to hydrogen or its ‘free’ ionic-protonic plasmoid core—the core ensemble of uranium or a transuranic element is constantly being pressured (from within and without) to disintegrate.

The ‘radioactive’ (dissipative) emanations of ‘unstable’ elements and isotopic forms of energetic matter can be thought of as like high-energy effervescence. Remember, the core energy-density of the intrinsic-neutronic hyper-plasma vortices of elemental ensembles (of nuclear vortices) is $\pm 10^{113}$ greater than the extrinsic energy-density of

elemental matter; and its EM force is $\pm 10^{39}$ greater than G field-effects (due to omnidirectional fluid mechanics and hydrodynamics). Also, recall that all phenomena are enabled and caused by intrinsic principles sustaining the 3 basic modes of the energetic field: 'ordinary' energy & matter and the 2 regimes of hyper-energy (and by their interactions).

For example, when it 'escapes' or is forced out of a complex element, a neutronic vorticle (plasmoid) lasts about 14 seconds and, allegedly, emits an 'electron' and a tasty yet virtually 'massless' anti-neutrino (instead of an anti-electronic positron). Then, allegedly, the previously neutral 'nucleon' seems to turn into a protonic vorticle (a hydrogen ion). Despite all the virtual realities, assumption, and confusion, SM QM and QCD also require other causeless and as yet unexplainable hypotheses, causing the infamous QM "neutron decay puzzle" (the NDS anomaly). Now, per post-modern ontology, the neutronic 'dark' stuff mystery (NDSM) is also obsolete.

However, using existing facts and methods of fluid mechanics, hydrodynamics, and upgraded (Prigoginean) thermo-dynamics* we can easily understand what really happens when a 'neutral' magneto-dielectric double-vorticle is 'pinched-off' and ejected from a protonic vorticle (nucleon) ensemble as a hyper-plasmoid explosion artifact. Clearly, that happens when a disruptive field effect (process or event) causes a disintegrative perturbation, a disruptively turbulent, disorderly destabilization and change of internal configuration, pattern of flow, and interaction.

The basic form and functionality of an elemental phenomenon (of the local field) may be sustained yet transformed. In other words, the balance of the magneto-dielectric forces of the contra-rotatory flows of an elemental vorticle's internal plasma and hyper-plasma vortices may be altered without changing its characteristic atomic form. How and why must that be true? Recall that the nature of being requires and sustains simplicity, integrity, regularity, and reliability. Those essential metalogical principles enable and sustain form, structure, function, energy, and generative interaction.

In other words, nucleonic cores of complex elements are like whirling, writhing, yet very orderly toroids or spheroids of sex-crazed snakes (made of hyper-fluid bi-directional vortices). So, an M Theory fix of String Theory is as unnecessary as the equally over-complicated, unexplanatory QED, SED, and QCD (and all the ridiculous excuses and anomalies they cause and require). The orderly, habitual configurations and relations of the elements—and their characteristic knots of internal double-vortices of energy and hyper-energy—are caused and sustained by the enabling field modalities, resonant harmonics, subharmonics, pressure gradients, characteristic interactions, forces, turbulent regimes, and sustaining effects of the metalogical principles of being.

The foregoing facts, theorems, and metatheorems also help explain the phenomena that adherents of QM, QED, and QCD misperceive, misunderstand, and misinterpret as fractional spin and partial charge phenomena. For instance, motion is motion. There is no half motion, nor any fractional spin. A thing either moves or spins, or it does not.

Misusing the word "spin" is a symptom of the linguistic problem explained in Appendix B, below (p. ?). Understanding the realities of elemental energy phenomena is easy when we eliminate the confusing SM rhetoric and shibboleths. For example, ordinary hydrodynamics and fluid mechanics help us understand nature's many kinds of interactive flow, laminar flow, pressure gradients, turbulent regimes, and vortical transport events—like hurricanes, tornados, lightning, electronic flow, and elemental

vortical flow. Those forms and modes of energy transport are enabled by principles that enable and sustain all fluidic, super-fluid, and hyper-fluid phenomena.

The most physical proof of that theorem is the super-fluidic modes of helium-3 (^3He) and helium-4 (^4He). For example, liquid ^3He or ^4He poured into a container—in a suitably cryogenic environment—cannot be contained in it, despite gravity. In other words, superfluid ^3He and ^4He defy the ‘law of gravity’ and most of the SM physics belief system. They can and do spread themselves as thin as possible over a suitable surface of another substance. Why and how? The SM excuse is that, while their temperatures enable superfluidity, ^3He and ^4He escape the force of friction. Of course, saying that fails to explain how or why they do what they do. Nor does making up ever more exotic maths or graphs or new hypothetical sub-nucleonic particles help us understand anything more about the nature of ^3He and ^4He , or of nature itself.

However, like all other elemental forms and modes of energy, the nature and potentials of ^3He and ^4He are enabled and determined by and respond to the nature and forces of the local subfield in which they exist, the most powerful being EM forces (EM_F).

So, the magneto-dielectric nature, energy, and forces of local subfield regimes—not gravity—dominate the activity of ^3He and ^4He . So, we can deduce and infer the principles and modes of energetic interaction that cause the properties, potentials, and modes of superfluid ^3He and ^4He and all other fluidic events. Hence, using the logic and facts of hydrodynamics, fluid mechanics, and plasma physics we can relate interactions of superfluid ^3He and ^4He with their [cryogenic] local subfields (surfaces, planets, stars, galaxies, cosmic plasma currents, and local hyper-plasma flow events) to the causal, enabling principles and well-known MDE^∞ & EM_F field-effects.

For example, we can deduce and infer superfluid ^3He and ^4He activities by relating them to the interactions of the regimes of the MDE^∞ revealed by cryogenic electro-magnetic storage toroids (EMST) and ordinary magnets.

First, though its liquid helium cooling medium may not be superfluid, the whole inner subfield of an EMST is super-conducting because the flow of energy it sustains is hyper-fluid. So, when its local MDE^∞ subfield’s condition is optimum, there is nearly 0 (zero) counter-acting resistance to flow (of energy), nor significant losses (dissipation of energy). In fact, sub-microscopic images taken at the interfacial boundary layer of the cryogenic and noncryogenic domains (the inside & outside) of EMSTs reveal nano-tornados (of bidirectional energy flow) forming, writhing, and ceasing, repeatedly. That enables ‘recharging’ of the EMSTs ‘inner’ MDE^∞ subfield (of luminal electronic plasma and hyper-luminal hyper-plasma). Like all tornadic/cyclonic events, nano-tornados are concentric double dual-vortices of MDE^∞ flow. Thus, their writhing axial core, though looking empty, is a hyper-luminal dual-vortex of hyper-plasma flow.

Now—far beyond what SM theory can explain—this view of a cryogenic EMST’s activity is also supported by the seemingly strange magnitude and super-extension of its ‘magnetic’ field (*i.e.*, its local MDE^∞ subfield). This approach also lets us understand and explain how and why its local MDE^∞ subfield extends so far beyond SM explainability. Still, we must always bear in mind that the best theory requires and enables the best understanding and explanation. Describing fractions of reality does not equal explanation.

Yet, despite the lack of adequate explanation, why do fans of SM QM cosmology ignore thousands of logical, astronomical, and elemental disproofs? The most logical

answer is that pop SM SMEs are either embarrassed or too intellectually (and ethically) dishonest or irresponsible, or else, possibly, simply confused or emotionally immature. Proof of those possibilities is confirmed by this metalogical explanation of the enabling principles and processes that allow superfluid helium to flow ‘up’ the walls of containers (away from planetary ‘centers of gravity’), despite gravitic side-effects (G_{fle}) of local subfields .

So, superfluid helium and other ‘matter’ at or very near 0°K (the “Z point” interface) are nearly perfectly resonant with the hyper-frequencies of the field of being, its ground/rest-state. So, superfluid helium always seeks the way of least resistance to its state of least turbulence, least stress, for greatest laminar flow and/or harmonic resonance (in contact) with local MDE^∞ (elemental E, plasma, hyper-plasma) subfield. As mentioned above, this explanation is also supported by the observable, well-known realities of magnets, including each atomic magnetic subdomain of a magnetized substance.

Remember, G_{fle} (of the field & subfields) is less than 10^{-39} as potent as the EM force (EM_F) of the $MDE_{f\infty}$ (field & subfields). So, the EM_F of every magnetized elemental vorticle (proton, or atom) and every piece of magnetic metal is $\pm 10^{39}$ times stronger than the G_{fle} of the local subfield (enabling it). That causes and enables the “work” (the force & interactions) and the results produced by magnets and their ‘fields’ (of energy), seemingly without any visible motion, motive, external power source, or generator. Of course, that’s obviously an illusion caused by limited consciousness (deficient knowledge).

Every magnet is a MDE field-effect—like an open valve—caused by all the forms and modes of energetic flow, vorticity, rotation, vibration, and interacting emanations enabled and sustained by the luminal and hyper-luminal $MDE_{f\infty}$ regimes of the cosmos (the field of being). In other words, magnets and their flow of energy are enabled and sustained by the whole field of being and its nature (activity, integrity, unity, and its other enabling metalogical principles).

So, in the absence of turbulent, noncryogenic perturbations, superfluid helium can only respond to the elemental flow trends of ‘containers’ and cryogenic environments per the intrinsic enabling principles. Thus, superfluid ^3He and ^4He resonate with and ‘spread’ out in the laminar interface of the local energy density/pressure gradient (the ‘ground-state’) at adjacent surfaces. In other words, the magneto-dielectric interactions of superfluid helium (with its local energy domain) and quasi-gravitic effects of intimate proximity with other cryogenic substances (due to locality, etc.) enable super-energetic flow. Regardless of the exact level of energy density of a cryogenic plane/surface, superconducting superfluids (^3He and ^4He) will reach their limit of elemental cohesion and viscosity. The intrinsic integrity of form, structure, functionality, and the subsidiary principles enabling them support those facts.

That proves and helps explain the metatheory of meta-energy, hyper-energy, and ordinary energy phenomena (sustaining the transfinite metalogical principles of being and its nature). Still, we can ask why the nature and interactivity of superfluid helium are not the same as other isotopes of He, or of H (or O_2). We can then verify the validity of macro-ontology by reviewing and analyzing the natures, forms, structures, functions, and interactions of those critically important elements of physical phenomena.

First, literally, Hydrogen (H) is the prototypical elemental form of ordinary matter. Now, recall that plasma accounts for nearly 96% of the field's luminal and subluminal matter; and most of the cosmic plasma is hydrogenic.

Why? The protonic core of H is the basic vortical component of all the more complex elemental plasmoids (atoms). Being the simplest, smallest, and least massive elemental vorticle, H is the most responsive to vibratory field-effects.

Now, remember, energy is activity or potential, proto-energy. Yet, the harmonic resonance of H in its native frequency, pressure, and flow regimes makes it one of the most stable expressions of elemental energy, along with its stable plasmoid ensembles (^3He , ^4He , and the "noble" gas elements). In fact, the nature of proton, H, is what enables the other stable elemental ensembles (atoms). Also bear in mind that mass is simply a measure of the energy entrained in and semi-contained when sustaining a form of matter (see def.). So, remember that mass is not matter.

Still, like other low-mass, normally extraterrestrial gases, at moderate temperatures and relatively low pressures, H is gaseous (molecular ensembles of H_2). At very-low temperatures and high pressures H is liquid, and at ultra-high pressures a solid, superconductive metal. So, if the SM prediction of a superconducting, solid, metallic hydrogen sphere in planet Jupiter were correct, it could cause a colossal magnetic field. Yet, there are many more massy elements in Jupiter's subfield of energy, that should be nested very much deeper than hydrogen.

Indeed, the next deeper layer of Jupiter's ultra-dense ground-state would be made of helium, somewhat pudding-like, getting more metallic or ice-like with depth. After all, though the existing ratios fail to comply with SM QM 'cosmology' predictions, helium seems to be the second most abundant element in the cosmos. But, why not? Helium isotopes are simply complex ensembles of protonic and semi-neutronic hydrogen.

Yet, clearly, their basic structural properties and potentials—not SM rules of pointiness—make hydrogen and helium (and their qualities, properties, and potentials) what they are. The electrons are really like electronic weather events, somewhat like nanoscopic versions of Jupiter's Red Spot and a bit like the persistent polar plasma currents of Saturn, the galaxy, and countless other subfields of the cosmos.

Here again, it helps to recall that the nature, normally stable integrity, simplicity, typical relational ensembles, and activities of H, its 2 isotopic forms, and H_2 are expressions of pure energy: meta-energy, hyper-plasma, and luminal plasma; and [that] all forms of energy are enabled by intrinsic, nonphysical metalogical principles (of being and its nature).

Also, without pre-existing enabling principles, processes, and powers, hypothetical (or undetectable) 'massless' particles of QM maths, equations, and hyper-complicated SM beliefs about an accidental space-time, inflatons, god particles, magic strings, spinors, twistors, mathematical dimensions of geometric space, and other unnecessary artifacts of SM quasi-science are unable to cause any physical elements, processes, and events, like the cosmos and particles. Granted, modern QM and EU theorists got some things right, approximately.

However, maps and models are not the territory, and maths' approximations are not precise measurements, nor completely accurate descriptions. So, we can take Einstein's advice. We can and should make it all as simple as possible, but not too simplistic.

For example, we can keep the technical methods that work in good accord with actual energetic phenomena. Yet, we can forget the most nonsensical and torturously over-complicated hypotheses, absurd theorems, bizarre assumptions, and pop-sci shibboleths of SM QM cosmology and neo-mythic dogma.

What does that mean? It means we can use vectors, even vector spaces, scalars, maths for hydrodynamics, fluid mechanics, plasma science, astronomy, and macro-ontology. That will enable a truly holotropic, evolutionary theory and metatheory of universal being, its enabling metalogical principles, and energy. It also means that we can drop all the confusing misuse of terms, concepts, and definitions that propagate ever more unexpected anomalies and baffling mysteries of SM pseudo-cosmology that seem to make SM QM a lame excuse for believing in an accident of atheistic creation of the field's infinite totality from a tiny point of nothingness at the center of nowhere.

* Dr. Ilya R. Prigogine won the Nobel Prize for his discovery of “dissipative structures” that have well-ordered properties of form, structure, and functionality that only exist as effects of conditions of great disequilibrium. In other words, while a subfield—like a pot of water or Saturn, the planet—of the $\{MDE^\infty, E_{em}\}$ field is subject to a high level of EM_F+K_F effects (vibration, heat, flow, etc.), its seemingly chaotic “normal” state (of equilibrium) gives rise to orderly patterns. That reality proves that entropy and chaos are not only not always the dual results of energetic processes. For example, at the bottom of a pot of water coming to a boil, the bubbles start forming in hexagonal patterns. Yet, as the temperature of the pot and the water approach equilibrium (at 100° C, 212° F), the patterns start disappearing. We see the importance of Prigogine's work at the poles of Saturn, some of its moons, and other planets with ongoing hexagonal patterns of 6 complex vortices caused by the dynamic interaction of the planetary subfield and the solar and galactic subfields (and the EM_F+K_F effects) as they all move through the cosmic $\{MDE^\infty, E_{em}\}$ field. Obviously, the cosmos is proving that the nature of being's magneto-dielectric energy causes its subfields, forms, structures, functions, and effects to keep spinning and flowing along in a perfectly orderly way. Of course, as also shown here and elsewhere, those realities of the cosmos are enabled, empowered, and sustained by the changeless, metalogical principles that are the nature of being.

Spin: This ontological definition of spin defines and explains it as the primordial form/mode of universal energy, enabled by integral enabling principles (of being and its nature). Of course, we might suspect that pulsation or oscillation or precipitation could be the most primitive form/mode of motion (energy).

We see pulsation, oscillation, and precipitation everywhere, but the most basic mode of motion that enables and sustains all other modes of motion (forms of energy) and physical processes is the axial spin, orbital rotation, and spiral/cyclonic vortical flow of energy that generates and sustains more energy (at all scales of form, structure, and functionality). Yet, in standard model (SM) quantum mechanics (QM physics), spin does not mean spin (the rotation of physically 'real' things). So, currently, SM “spin” is a term that signifies various measures and descriptions of incompletely yet statistically defined objects of QM models of

- a. hypothetical (conjectural) geometry
- b. fields (of theoretical configurations of mathematical objects), and
- c. partially observed field-effects (of undefined/ill-defined energy/matter)

So, results of QM, quantum electrodynamics (QED), and quantum chromodynamics (QCD) are as impressive as the models' mathematical descriptions of objects (etc.). Yet, its fractional and integer unit 'measures' of SM 'spin' tell nobody anything definitive (about the whole realities of the field, its subfields, elements, and why they are as they are and do what they do). In fact, it helps believers think and talk as if invisible points of maths really have partial spin, gravity, colors, and electrical waves (without a fluidic magneto-dielectric medium).

For example, despite impossibility, QM believers say that the 'spin' of theoretical particles (of undefined stuff) is either fractional or whole number values. For instance, motion is motion. There is no half motion, nor any fractional spin. A thing either moves or spins, or it does not.

Yet, QMs theorists neither define nor explain any processes or principles that cause a thing to have supernatural multi-spin, half-spin, and so on. Why not? It must be because QM experts know nothing about 99.9975% of the cosmos (reality) and the nature of its MDE^∞ field (of being). Why not? Because, as is, QM excludes adequate data, knowledge, terms, and definitions.

Why is that? Unfortunately, the sociocultural paradigm of nonholonomic QM, and its domain of discourse, prevent using, thinking about, and discussing any realities and concepts outside its obsolete framework of theoretical reference. However, like all theorems and hypotheses, QM's perverted spin can be rehabbed and upgraded or discarded. Yes, it can be converted into a term referring to the real spin of actual plasmoids, vortices, and other energetic phenomena (caused by understandable, explainable properties and enabling principles).

So, in the case of protonic and neutronic vortices (nucleons, not particles), we can understand the observed "quantum states" of measurable spin as caused by the nature and conditions of the various intra-elemental subfields (radiation pressure gradients AKA SM 'electron shells') and the local external subfields in which they exist. Those 'quantum spin' field-effects are also the results of the various ratios of internal rotatory velocity and vortical and/or toroidal/hypertrochoidal flow (through and around axial double vortices) of luminal and hyper-luminal energy. Yes, those rates of motion are enabled and determined by local (intra- & extra-nuclear) field-effects and the supra-elemental forces impinging on (and existing as) the local subfield of a nuclei or ensemble of nucleonic vortices (an 'atom').

To more easily understand that, we can use a quasi-fractal analog. For example, though the sun is not exactly like an elemental vortice (a nucleon), a star is a plasmoid phenomenon, a sub-galactic MDE^∞ field-effect of universal energy. So, we can say that, in principle, the heliosphere is somewhat like a radioactive isotope of iron. We can visualize Earth as a protonic vortice, with the moon being its single, electron.

Of course, for this Bohrian analogy, if we fail to replace the moon with a vortical flow phenomenon (of pure energy), then it suffers Bohrian defects. Thus, we may as well imagine Earth being made of pure luminal & hyper-luminal energy flow. Doing that, we can 'see' it's E_{EMF} & MDE^∞ field-effects as a subfield of the sun's subfield (of the galactic

subfield). In other words, we do an inverse, reductive extrapolation, down to the elemental and sub-elemental scales of energetic flow, form, structure, and functioning. So, in the macro-model analogy we see the complex, interdependent forces of EM effects, fluid mechanics, and the enabling MDE^∞ field-effects (of interacting subfields of the cosmic field of being's energy) embodying and/or expressing intrinsic enabling principles of being (and its nature).

In the micro-scale model, the embodiments and/or expressions of being's nature and primal energy vary in kind and intensity, but not in principle. So, we can now visualize the cyclonic/tornadic vortices and hydrodynamics of the various levels of form, structure, functionality, and interactivity in the molecular, elemental, and sub-elemental regimes (of the field of being). We can see them being a bit like planetary and solar 'weather' events (i.e., energetic field-effects), at least in principle. Yet, the quantum numbers for QM 'spin states' need more explaining.

And Spin is clearly not a state of a thing. It is an action, a mode of motion, which is a mode of energy, generally considered a form of kinetic energy. However, the old terms can be confusing. For example, saying "kinetic energy" may lead to thinking that there are separate kinds of energy. We should think of kinetic forces and effects of energy we perceive and detect (and measure) as K_F , embodied and/or expressed in what we can call mechanical phenomena. At the deeper levels of being, mechanical effects are all enabled by EM forces and effects, fluid dynamics, and intrinsic principles enabling the whole MDE^∞ field of universal energy (and all its subfields, including sub-elemental levels of energetic interactivity). That makes K_F intrinsic to the E_{EMF} of the field.

Now, consider quantum spin numbers and quantum 'jumps' of energy, electronic and photonic transitions (in particular). Also recall that neither 'electrons' nor 'photons' are isolated balls of stuff, and nor are they simply points of magical maths. So, there is no good reason to assume different causal factors producing similar quantum limits. Thus, we can and should relate the intra-elemental field-effects with spin, wavelengths, frequency, velocity, energy levels, and reactions/emissions with extra-elemental (external local) field-effects. After all, even current SM QM theory claims that electrons (etc.) are field-effects (of energy, without bothering to fully define or understand energy and its source).

For instance, Einstein's relating of frequency and proportional energy levels to the photoelectric effect (and quantum thresholds) was and is a very limited confirmation of the nature of energy and its $MDE_{f\infty}$ (the 'field' of universal energy so incompletely defined and misunderstood in current QM). A major part of the QM problem was and is defining time and space incorrectly.

Thinking of time as a physical quantity was and is both confusing and misleading. Thinking that space is an empty container of particles, wavicles, or bundles (packets) of ill-defined stuff was and is equally confusing and misleading. Time—even its 'operational' definition—is a conceptual fiction. Space is a perception/conception of energy's MDE medium, the omnipresent source of energy (enabled by intrinsic nonphysical principles, especially form, structure, functionality, activity, etc.).

In principle, the pressure gradients, varying levels of energy density and interactivity in Earth's local subfield, from its inner core on out (to the fringe of the "Van Allen Belts") are somewhat similar to conditions at the elemental scale and beyond. Especially at the nanoscopic levels, there is no difference between pressure gradients, vibratory resonance,

and their energy density. Actual conditions and interactions are determined and limited by the intrinsic principles enabling all forms, structures, functions, and interactions.

So, all the attributes of the $MDE_{f\infty}$ and its energy can only be expressed and/or embodied in accord with the nature and ambient conditions of the eight (8) vibratory pressure gradients of luminal energy interacting with the ninth/zeroth ($9^{\text{th}}/0^{\text{th}}$) regime of hyper-high frequency energy and meta-energy domains. Thus, we find 8 'electron shells' and 8 'valence electrons' and 8 'periods' of subluminal elements. Clearly, there are no fractional spins or multiple spins of electronic, protonic, and neutronic points (SM 'particles'), just varying rates of flow and rotational velocities of the various laminar and turbulent field-effects (of the different energy density gradients, not shells).

Oddly, SM physicists and chemists talk about 'electrons' as if they are tiny, electrified planets or moons, but also as if they can fill their 'shells' or leave them empty. Naturally, the realities, observations, and data make more sense with fluid mechanics and energy density gradients, caused by resonant energy dynamics, vorticity, vortical motion, flow, turbulence, vibration, and radiation pressure. Now, we can more carefully consider the original spin.

Currently, QM cosmologists believe it necessary to make up weird excuses for the "red shift" of light seen as coming from extraterrestrial plasma phenomena, galaxies, and stars as evidence of accelerating expansion of the explosion of nothing that caused everything. Of course, the SM and all its excess particles, hunches, and crutches seem to support a big bang of everything from nothing, because the model and its exotic particles of maths were designed specifically to support all the required assumptions.

Yet, a more realistic explanation of the "red shift" and how the universe works involves its most common forms/modes of motion and flow: rotation and the vortical, laminar, and turbulent modes. Granted, knowing exactly how purely nonphysical, metalogical principles and meta-energy caused the emergence (or precipitation) of either hyper-luminal plasma or physical forms/modes of energy (flow, spin, etc.) is as far beyond the domain of science as making models of universal totality exploding out of a point of nothingness. However, once the energy of being and physical potentials emerged, the most basic expressions of activity and interaction could generate the basic modes of motion, entraining more energy out of the hyper-luminal MDE^{∞} regime of the field.

Clearly, because of the enabling principles required, we can reasonably assume that spin was essential to the initial energy required for everything else. So, instead of a residual 'cosmic microwave background' caused by an explosive magical expansion (before there was any place, time, and stuff to cause it), the basic heat energy of being's $MDE_{f\infty}$ (the 'field' and its activity) can be understood as an effect of [its] spin, subfield interactions, and vibratory effects (turbulence, etc.).

Naturally, heat requires causes, interacting subfields, varying rates of flow, and the effects of turbulence (etc.). Obviously, the cosmos is the totality of such phenomena and their energetic emanations. So, it seems most likely that the overall spin of the cosmos interacts with the different rates of motion of its hyper-luminal and luminal subfields (causes of cosmic heat).

That hypothesis may apply to unexpectedly hot "strange attractors" (that seemed like the emptiest parts of the cosmos). Such hypotheses and theorems may seem hard to

accept, but they are clearly more realistic and reasonable than the nonsensical assumptions and absurd claims of mainstream QM cosmologists.

Galaxy: The word comes from the antique notion of a “milky way” in the sky. We now know that what seemed milkiness appears because of the luminosity of a) this galaxy’s energetic nebulae, b) radiant plasma currents, and c) ± 100 billion star systems.*

What is still not so obvious is that galaxies really are fluid mechanical events enabled by the hydrodynamics, quantum hydrodynamics, and hyper-field fluid mechanics of the field of being. So, intuiting milkiness from visual observations of the “local” galactic subfield (of the universal field of being) was really not far from being a good descriptor. Yet, obviously, fluidic gaseous and liquid flow effects of energetic phenomena (matter) enable a more realistic view of the field (of being).

Sadly, abuse of maths and language (etc.) maintains fantasies and deceptive hypotheses about the nature of the cosmos, being, and universal reality. For example, we now know that the outermost fringes of a spiral galaxy rotate at exactly the same rate as its axial core. Naturally, that means that all the radiant energies of a galaxy are constantly energizing (empowering) its axial core. That also tells us that the observable effects (of $E_{EMF}+K_F$) of galactic energy will be proportionally large. So, we can be sure that the principles of vortical flow, hydrodynamics, fluid mechanics, and relevant EM theory are sufficient to account for and describe a galaxy’s current mode of activity. That eliminates the illusory need for ridiculously illogical theory.

That may seem overly optimistic and unrealistic, but consider the largest galaxies ever observed, one appearing as an ellipsoid cluster of $\pm 100^{12}$ (nearly 100 trillion) star systems. The currently dominant SM QM gurus and fans ignore all that, and the evidence of logical, structural, and functional enabling principles (and the $E_{EMF}+K_F$ phenomena being 10^{39} stronger than G_F). So, clearly, understanding galaxies requires acceptance of the principles of being that enable cosmic reality, energy, and nature.

Still, it may seem strange that any galaxies and star clusters are not the typical vortex form, like ultra-colossal hurricanes of energy. Yet, “strange attractors” and many other phenomena—currents of star-forming plasmas, nebulae, variations on the typical spiral galaxy form, etc.—indirectly show us that the cosmos has many different ways of causing and shaping flow regimes in and around galaxies (etc.). For example, the hydrodynamics and fluid mechanical forces of the magneto-dielectric field’s luminal and hyper-luminal (‘dark’ energy/matter) subfield interactions enable every kind of form and structure we see (or detect).

For a visual proof of that theorem, see the “Primer Fields” videos by David Lapoint, and the computer simulations of plasmonic galaxy formation by plasma physicist Anthony Perrat. However, it seems sufficient for this definition to explain “globular” clusters—of tens of thousands to tens of millions of stars—and larger, spheroid and ellipsoid galaxies as being formed by omnidirectional $E_{EMF}+K_F$ (electro-magnetic & kinetic) interactions, magneto-dielectric field-effects. After all, the best estimate of QM pioneers is that the Planck energy-density of “space” (at the 0° K interface of luminal & hyper-luminal regimes) is $\approx 10^{113}$ greater than elemental matter’s energy density, and E_{MF} is $\approx 10^{39}$ times stronger than G_F (a side-effect of field+subfield interactions). Also, recall that conventional physicists correctly defined G as acceleration (which is caused by energy and its $E_{MF}+K_F$ modes of activity).

* $\approx 100^9$ seems to be the current best estimate of the number of stars within the subfield of our galaxy.

Force: A force is a property and effect of energy; and energy is omnipresent, pervasive. So, there are no isolated, independent forces sustaining the forms and modes of elemental matter (etc.). Labeling different 'kinds' of force, as if they are isolated, tends to confuse the forest of energy with the trees (of force).

What seem to be separate forces—a 'strong' force, a 'weak' force, 'gravitational' force, and electromagnetic force—are all just effects of interacting, interpenetrating vortices, currents, and expansive magneto-dielectric subfields of energy and hyper-energy. Those enabling forms and modes of energy are field-effects (MDE_{fe}) of the cosmic magneto-dielectric field of being and its energy.

So, the 4 apparently separate forces of dominant QM physics are misconceptions and misinterpretations caused by exotic maths, deficient theory (mostly shots in the dark), conjectures, and inadequate knowledge based on fractional observation, defective linguistics, and deficient ontology. In other words, as Faraday and Tesla intuited, the all-pervasive, magneto-dielectric (MDE^∞) nature of **E** (energy) enables all subfields and all modes of energy, at all scales. It enables all observable forms, structural modes, functions, motions, and interactions of galaxies, suns, plasmas, elements, molecules, compounds, weather, prions, viroids, mitochondria, DNA, RNA, life, and us.

For example, the 'strong' force is actually just the stronger integrative effects of bi-directional protonic dual-vortices, their rates of flow, the momentum, velocities, intensities, densities, vibratory motions, and radiant emanations. They enable and are enabled by the 'internal' and 'external' pressure gradients of the local subfields ('inside' and 'outside' the elemental gradients of resonant energy density). That explains the activity and limits of elemental quanta and 'quantum leap' thresholds of transition and transformation.

Naturally, that applies to vorticity, spin, rotation, orbital velocities, and the angular momentum enabled. Thus, we can think of 'electron shells' as like nested bubbles, with internal harmonic (yet roiling) plasma pressure gradients/zones of density, resonant & turbulent activity, and force. 'Electrons' are like swirling femto-hurricanes on the interfacial 'surfaces' of the elemental bubbles of energy. Yet, they can align and merge with the electronic vortices of other elemental bubbles, enabling the connecting double-vortex of vectored flow (as subnano-tornados of luminal energy and protonic hyper-plasma). The strength of the protonic and electronic flows and connections (of nucleons and/or molecular ensembles) are enabled by and depend on the protonic/molecular configurations and ever-changing conditions, caused and enabled by the nature of the field and its elements.

Consider a 'line of force' really being a twisted-pair of bi-directional (double) dual-vortices of energy, with hyper-plasma at the axial core. So, the transfinite axial line in the center of each filament is not simply a directional vector in 'space', but a hyper-powerful MDE^∞ effect of elemental interaction in and with the field and 'local' subfields. Now, as explained in the definition of energy, the misnamed 'dark' energy and matter are major modes of the MDE^∞ hyper-energy domain. The principles, properties, and effects of energy's MDE^∞ nature let the hyper-plasma modes interact with our more turbulent, slower, lower energy domain and elemental phenomena, 'inside' and 'outside' of every

flowing protonic vorticle of elemental energy (E_{em}).

The nature of the field's MDE^∞ and EM field-effects, forces, flows, and potentials are what makes what we 'see' as twisted-pair dual-vortices of plasma (and 'lines of force') in a magneto-dielectric field tend to stay apart, twist, spiral and/or loop. So, they also tend to stay coupled with and by those interacting, seemingly 'internal' and 'external' forces of the field (and its nature). The exception to that is the natural tendency of plasmas' twisted-pair double-vortices to come together as their energy, flow, and force grow beyond the point of balance. Interactive field-effects can then compress and constrict ('pinch') a segment of the plasma filaments. They then ball up, like a spheroidal knot of roiling vortical loops. That can then be pinched off, to become a micro-plasmoid (an elemental vorticle, proton, etc.) or a macro-plasmoid (a star). They can then be sustained by the MDE^∞ and EM_F field-effects, galactic/extra-galactic currents, and other effects of energy and hyper-plasma.

So, lines of force, 4 independent 'forces', 'quantum gravity', and gravity in general are clearly unnecessary flukes of obsolete theory. Effects of MDE^∞ phenomena—plasmas, plasmoids (protons, suns, etc.), and elements—and all MDE^∞ field-effects can be understood and explained with hydrodynamics, fluid mechanics, and the maths of upgraded electrical engineering & EM theory.

That is so because the field of being and its MDE^∞ are omni-present, all-encompassing. They pervade, enable, empower, motivate, and enliven every domain, mode, and effect of energy and matter. Hence, nothing is separate or independent of anything or everything else in subfields of elemental m , E , MDE^∞ , and EM interactions (which are all that exists). Of course, force is also a concept and a functional property that enables and sustains the activity and effects of energy. So, forces are effects of E , enabled and governed by nature's functionality, the metalogical principle that enables activity. (see defs., Energy, Matter, & Activity)

Particles: In the mainstream 'standard model' (SM) QM (quantum mechanical) theory, a 'particle' is an undefined point that exists only in relation to other theoretical objects, including the curvy [QM theoretic] field of nothingness, in which those points allegedly exist. Hence, they are all described by and per the rules of current SM QM ideas and beliefs.

For example, SM QM "points" are supposed to have various kind of spin, including "up" and "down" and fractional spin (without having any substance to spin). Allegedly, they also possess other properties, without possessing pre-existing or intrinsic enabling principles (and substance). Nor do they have any causal processes that caused them to become physically real universal phenomena. So, evidently, SM QM theorists and fans also believe that dimensionless points can be of various sizes, charges, abilities, functions, and powers without having any real substance or form (and intrinsic structure) to enable their properties and powers. So, particles exist as QM objects because of assumptions about space, time, fields, and probable properties of particles (and conjectural models).

In fact, the whole basis of modern QM theory depends on assumptions and arbitrary beliefs about probabilities, time, space, distance, metrics, and statistics that may or may not be totally reliable and valid for all time and all cases in all frames of reference (beyond those accepted as necessary and sufficient for SM theory). Clearly, the situation

now fits Kuhn's definition of science in crisis mode.

If that claim was untrue, then SM QM theorists could explain why and how points of nothingness can have properties, functions, motions, and interactions that cause and sustain actual physical phenomena. Yet, they cannot explain all those magical powers of QM points, nor how they suddenly appeared in an original point of nothing, in the middle of nowhere. So, for a reliably useful, truly scientific definition of "particles" we need a good definition and explanation of their nature, and of what they are not.

Now, first, we must distinguish purely theoretical particles from actual (or physical) particles.

Theoretical particles are mathematical or philosophical objects of consciousness and/or imagination (or delusion). They have no actual nature of their own, other than as objects or units of theory, enabled by mentality (etc.). They are defined or described in accordance with the terms, axioms, and rules of the theoretical domain of discourse that enables their mental (or illusory) existence.

Actual particles are constantly changing events enabled by the intrinsic principles of their nature, universal nature, and its field and subfields of magneto-dielectric energy. Whether we think of a grain of sand or the tiniest particle of an element, actual particles are field-effects, with actual form, structure, functions, properties, qualities, and potentials enabled and determined by natural principles and interactions with the field of being (and its energy) that sustains them. Every physical thing—however tiny or solid or as vast as the cosmic field—is energy, a constantly changing form of energy.

Thus, all actual particles embody and/or express all or some of the principles and properties of physicality and natural actuality. So, in terms of modern physics, actual natural particles have mass and some intrinsic motions. They or their components can spin, sustain vibratory interactivity, and so on, because of their physical form (etc.) and energy. They all have mass because it (mass) is a measure of intrinsic energy enabling and sustaining their form, structure, and functioning. That is so because all forms of detectable matter are forms of energy, the energy of the magneto-dielectric field of being (the cosmos/universe, " $U_{f\infty}$ ").

Those essentials of actual particles are necessities because motion, vibration, spin, and velocity are expressions of energy. So, we can also understand energetic particles by seeing what they are not.

Thinking or saying that 'photons' are moving particles (points) of light without mass is as ridiculous as believing that neutrinos, gluons, and inflatons are actual particles—that move and cause physical effects—without the essential necessities that enable the energetic physicality of actual particles (vortices, vortices, etc.).

For example, because of the nature, dynamics, and actuality of $U_{f\infty}$ (and its magneto-dielectric field of energy), we can perceive physical objects we call particles. Only the necessary physical constituents and intrinsic enabling principles of actual particles can make them possible, and truly real.

So, consider this, most of the particles we can see, touch, or smell and/or taste are made of physical substance, elements and compounds. Most such particles are made of an element or a chemical or crystalline ensemble of elements (molecules). We also conceive of objects with some virtual, mental, or hypothetical existence we think of as real. Yet, if we consider mental objects of consciousness as real constituents of our

psychologically or mathematically real virtual reality, then they are virtually real, as such. That does not make them or our thoughts about them concretely real physical objects. Confusing the difference between actual and virtual objects and particles led to erroneous theory and hypotheses about particles.

Thanks to Democritus, et al, the particle theory of physics began thousands of years ago (in ancient Greece via speculative thinkers in India). Sadly, the ancient Greeks suffered pandemic egomania and cultural chauvinism. That kept them from citing their foreign sources. Seemingly, it also kept them from seeing that their ideas were purely mental phenomena. So, since then, reductionistic-particulate materialism developed in several spurts, to the 20th century and beyond.

Now, the current SM theory — mostly due to Maxwell, Thomson, Einstein, Lorentz, Rutherford, Schrödinger, Heisenberg, and Bohr — is popularly thought well-proven. Yet, more than a few problems, weaknesses, deficiencies, and defects remain. Thus, instead of decreasing, the anomalies keep increasing in proportion to the exponentially increasing discoveries of astronomy (etc.).

Still, QM succeeds by supplementing particle theory with statistical maths, approximating probabilities, processes, and 'behaviors' of models of 'atomic' and subatomic particles (and their theoretical properties). SM physics also relies on ever more exotic hypotheses, normalizations, and renormalizations enabled by increasingly complicated maths, probability theory, and ever more approximations based on empirical data and preconceived SM interpretations (of the data) that best fit SM models and expectations. Of course, more than 1 (one) SM model makes all of them equally notional, and equally subject to falsification, ridicule, dispute, and disproof.

However, disputability of truly scientific theory enables progress to better, more explanatory theory, and to a more realistic post-modern era of physics and ontology. Unfortunately, the new old guard of the current SM resist every attempt to upgrade their ever more obsolete belief system (to retard progress to better science).

The alternative? Instead of imagining inflatons, gluons, strange quarks, and other tasteless yet flavorful or colorful subatomic 'points' (made mostly of nothingness and undefined energy), we can understand all energy phenomena and effects as artifacts of the turbulence, pressure gradients, and resonant regimes of energetic flow and vibrant interactions, or as vortices and vortices, vectorial vortical and quasi-toroidal artifacts of explosions. We need no causeless points of better magical balls, nor any more fantastic excuses posing as well-founded scientific theorems.

Hence, we should abandon all deficient QM hypotheses that require fudging and guesswork (while lacking elemental causality and satisfactory explainability). That will eliminate countless, ever-increasing anomalies of astronomy (etc.) that disprove current pseudo-cosmology and its shibboleths. So, we can build on what remains, with good theory, based on real understanding of enabling principles and evidence. Then, what seem to 'look' and 'act' like particles can be seen as field-effects caused by all the interacting, co-emergent energy-flow phenomena sustaining the field of universal being. We can think of it as being like atmospheric or oceanic phenomena induced by thermodynamics, hydrodynamics, weather, earthquakes, volcanos, propellers, jet skis, etc. Thus, we could and should develop a new theory of quantum fluid mechanics (to upgrade QED, SED, and QM theory).

Of course, the reasons may seem insufficient, misleading, confusing, or unnecessary.

Yet, hyper-plasma hydrodynamics, meta-fluid mechanics, better hydrodynamics, fluid mechanics, plasma physics, and magneto-dielectric field theory will prove effective and satisfactory.

Power: Power is the capacity or potential that can enable action and effects. Power is clearly a subsidiary principle and property of functionality, the primal metalogical principle that enables its nature and potentials.

However, power enables the potency of functionality and all the other primal metalogical principles that enable being and its expressions and embodiments (of physicality, mentality, etc.). In the era of invention and engineering that gave us Nikola Tesla and the electrical infrastructure of this modern world, voltage was understood as potential. So, Tesla was not wrong to call his resonant coil and capacitor circuits power amplifiers. Hence, they now power the most powerful lasers in the world, used in fusion experiments, and other high-energy physics R&D.

In fact, the potential power of an electric motor is determined more by voltage (intensity, strength, and potential) than by amperage (quantity, current, flow). Higher voltage enables more effective use of the flow of energy. Thus, power is a prime example of the integral interdependence of all the enabling principles of nature.

For example, because power enables the potency of the nonphysical principles that enable energetic phenomena — forces, matter, places, processes, events, etc. — we have experiences enabled by our sense perceptions and mental activity. Of course, life and experience are also expressions of those principles and their properties, enabled and sustained by power.

Energy: Few modern theorists realized energy's magneto-dielectric nature (intuited by Michael Faraday and Nikola Tesla). Des Cartes and Newton never came close. So, their followers and successors were led astray.

Now, we know that magneto-dielectric energy (MDE^∞) and its electromagnetic and elemental forces (EM_F and F_{em}) are more than $\pm 10^{39}$ times stronger than G (AKA g, the 'force of gravity'), a by-product and field-effect of energy, hyper-energy, and meta-energy. In fact, some bright QM 'physicists' found that magneto-dielectric hyper-energy (at 0° K, zero-point, E_{zp}) is $\pm 10^{113}$ greater than the energy density of massy (*i.e.*, lossy) elemental matter. Yet, like matter, energy is an emanation and expression of the intrinsic principles of actuality, causality, potentiality, activity, motility, reciprocity, and magneto-dielectric relativity.

So, naturally, the enabling principles and properties of energy are enabled by the universal metalogical principles of being, form, structure, functionality, actuality, activity, causality, vitality, expressivity, permittivity, susceptibility, transmittivity, receptivity, potentiality, and potency (etc.). From ancient times, observers with great awareness understood the life force (our essential bio-energy and mental activity) as an expression of energy and power they called prana, la, chi, ki, or whatever. We can think of its highest level of activity as meta-energy.

We can be sure of that because change and motion are modes of energy expressing the nature of activity, its essential enabling metalogical principle. For example, our thoughts and modes of mental activity change and cause effects and changes in our local

field of being. Yet, mental/emotional activity is not only mediated by physiological, electrochemical interactions of our cells.

Our local field is pervaded by all the EM forces and magneto-dielectric field phenomena of being, including all the EM emanations of every cell, every mitochondrion [*sic*], every microbe, and every viroid/virion, and every molecule (RNA-DNA, etc.). Countless quintillions of ‘atoms’ of elemental matter—in and on and around our bodies—are emanating energy at their own characteristic frequencies, intensities, and modes of vibratory activity. Of course, whether we notice it or not, each of those embodiments of being and their energetic field-effects are always changing, causing new changes in our personal psychophysical fields of being and experience. Our minds and bodies are complex, nondual phenomena of the field of being and its energy, at every level and mode of interaction (from the ‘subatomic’ on up/out to the macrocosm) and intelligence.

The primal properties of energy (its magneto-dielectric field effects and electromagnetic forces) are functionality, motility, fluidity, effectivity, relativity, reciprocity, interdependent interactivity, transmittivity, conductivity, permeability, resistivity, impedance, capacitance, inductance, permanence, multiphasic presence, transfinite duration, power, force, radiant emanation, pulsation, oscillation, vibratory motion, axial/vectorial vortical flow, and momentum.

Naturally, most of energy’s properties are principles, enabled by other intrinsic principles, like directionality, locality, physicality, unity, duality, totality, and the other principles necessary for universal being and life. For example, all the principles and properties of energy enable and animate living beings, even viroids, virions, and prions. So, composite beings live as long as their intrinsic energy level remains sufficiently above the minimum required. (see def. of Life)

A more microscopic example of the nature of energy can be seen at the laminar boundary layer of toroidal superconducting cryogenic storage coils. The nearly complete lack of counter-electrical resistivity enables almost perfectly unimpeded plasmonic flow of energy within and around the toroidal field of flow. However, the cryogenic environment is slightly less than perfect. So, tornado-like microscopic double-helical vortices arise, persist, and dissipate, intermittently in the transition layer boundary between the singular, toroidal flow of electronic fluid and the surrounding bath of super-fluid liquid helium. Hence, the apparently empty core of the nanoscopic tornados forming and dissipating in the almost turbulence free transition layer are actually full of the pure hyper-energy/matter exchanged at and with the invisible $\{MDE^\infty, E_{EMF}\}$ boundary.

Those high-energy phenomena exhibit characteristics that help us understand the cryogenic and near-cryogenic, ultra- and hyper-high energy states of the extra-planetary domains of the cosmic $\{MDE^\infty, E_{EMF}\}$ field. In other words, the microcosmic vortices we see in the cryogenic domain of toroidal superconducting (energy storage) devices, demonstrate the same intrinsic principles that enable and govern the axial vortices at the center of galaxies, hurricanes, tornados, lightning, and the twisted-pair filaments that cause polar auroras and intergalactic currents of plasmas and hyper-plasma. So, we can see that the super-massive energy-density (mass) at the heart of a galaxy’s axial, double-helical vortical flow is due to the radiant MDE field-effects, E_{em} forces, flow, and

pressure gradients. Those are caused and sustained by all the energy of stars and plasma currents charging a galaxy's axial vortex or spheroidal core.

That theorem is supported by the fact that the furthest reaches of a galaxy's spiral 'arms' (clouds & currents) of stars move at the same velocity (rate of rotation) as the inner-most boundary of the eye of the galactic hurricane. So, all the suns' positions relative to the galaxy's central quadruple-vortex (or core) remain relatively fixed. Thus, the core energy density can be calculated per...

$$\text{Eq. 1: } E_{Gc} = ((n_s \sqrt{E_s}) E_{em} (E_{EMF} + K_F)) \cdot 10^{\pm 39} (g^3/m) v \pi r^4 \cong D_E \therefore$$

$$E_{Zp} = \pm 10^{113} \equiv E_{gc} + E_{PH} = E_{U^\infty} \geq (10^{\pm 113} + 10^{\pm 39}) \pi^4 \geq 10^{152} \pi^4 > G$$

In other words, the energy density (D_E) of the galactic core (E_{Gc}) equals the number of local stars times the square root of the stars' radiant energy times the quantity of elemental energy phenomena times the scalar product of energy's electro-magnetic and kinetic force ($E_{EMF} + K_F = 10^{\pm 39}$) times gravity, times the cube root of galactic mass (g^3/m), times its rotational velocity times pi times the 4th power of the radius.

That is so because all galactic subfields (of plasma, stars, etc.) spin as a single $\{MDE^\infty, EM_F\}$ phenomenon, energizing their axial cores (etc.). Thus, we have minimum hyper-luminal $E_{Zp} \approx 10^{113}$ and approximate luminal energy density equal to $10^{\pm 39} (g^3/m) v \pi r^4$ at a galaxy's core.

However, spiral galaxies have quadruple laminar vortices, caused by their bidirectional double-helical vortical flow of hyper-plasma (E_{PH}) within and around their 2 bidirectional double-helical vortices of $\{MDE^\infty, EM_F\}$ flow, and galactic electro-magnetic and kinetic forces ($EM_F + K_F$). So, per QED & SED theory, since the relative energy density of E_{PH} at E_{Zp} is at least $\geq 10^{113}$ times greater than that of 'normal' E_{em} density (and EM force is $\pm 10^{39}$ greater than G , gravity), the apparent mass and energy of the exact center of a galactic vortex is virtually infinite, equivalent to $E(m) \approx E_G \cdot 10^{152} \pi^4$ (at the least).

That explains the apparent existence of a super-massive 'object' (without detectable luminal mode energy) at a galaxy's core. Also, a galaxy's local hyper-plasmonic field is moving with and within the galactic spin of luminal $\{MDE^\infty, EM_F\}$ phenomena, and vice versa. So, they are inseparably interdependent, interactive, modal domains of universal energy (E_{U^∞}) and universal being/actuality (U_A).

That explains the existence and detection of ultra-colossal jets, colossal "bulbs" of ultra-high-energy gas, and plasmonic currents that emanate from the galactic core (somewhat like magneto-dielectric lines of force in a spinning semi-spheroidal field, AKA a "magnetosphere"). Naturally, despite QM nonsense and ignorance, all magnetic and electrical flow phenomena are inseparably interdependent field-effects. Thus, as the intrinsic principles of being enable and sustain U_A (the cosmos), pure energy enables its field of magneto-dielectric and elemental energy phenomena, $\{MDE^\infty, EM_F\}$. They are all enabled and sustained by E_U (including its enabling meta-energy and hyper-luminal hyper-plasma).

So, if there are any spheroidal 'objects' at the centers of galaxies, they must be ultra-colossal hyper-plasmoids caused by plasmonic pumping and the "pinch" process, not by former super-stars shrunken into a nothingness with ever growing mass and gravitational suck. Thus, the fake need for reifying (thingifying) conceptual objects and

artifacts of abstract maths and statistics is superfluous. Yes, all the illogically confusing singularities, like black holes and big bangs (of nothing before beingness began) are now unnecessary. (see defs., Particles, Fields, Energy, etc.)

However, we can also see a QM point of “singularity” as the 3D center and central focal point of all the energy empowering a galaxy and its vortical axis. Yet, we should remember that most galaxies move within galaxy clusters within super-clusters, within ultra-colossal currents of energy and hyper-energy. Some are flowing across more than half the diameter of the detectable field of universal energy. Obviously, like any other EM circuit, those currents begin at cathodic sources, and flow toward anodic locations.

Those ultra-colossal circuits and their contents are interactive effects of their internal (and surrounding) hyper-luminal E_{PH} medium. Also, recall that the detectable region of being must be moving with the rotation of the whole field, but at a rate undetectable from within it. Yet, we can accept cosmic spin, hyper-viscosity, and turbulence as the source of energy released by field-effects (as ‘background’ microwaves, cosmic rays, galaxies, stars, plasmas, light, etc.). Hence, equations 1 and 2 (above & below) are only good for finding approximate energy density of galactic cores (relative to the local subfield of a galaxy). To precisely calculate the absolute energy density of a galactic core requires including the velocity of the galaxy’s motion in or relative to the others in a cluster and, also, to the field external to the plasma current carrying them toward its terminus, and its actual velocity of spin around the cosmic axis of rotation.

Clearly, we should also acknowledge the total energy and velocities of the plasmonic currents and subfields moving the galaxies, stars, nebulae, and the field (E_{U^∞}). Ideally, the equation would also include the actual energy (and velocity) of the field spinning around the universal axis, as

Eq. 2: $(E_{Rv})\pi r^4 = E_{PH} \wedge E(m) \geq 10^{152}(E_{U^\infty})\pi^4$

That equation indicates immeasurably infinite universal energy (E_{U^∞}). After all, it is infinitely transient, generative, enabling, sustaining the totality of U_A (universal actuality) and its magneto-dielectric field of phenomena and meta-phenomena. Clearly, though meta-energy and nonphysical phenomena (principles, etc.) are not and cannot be directly sustained by luminal and hyper-luminal energy, they are all as inseparably interdependent as the relativity of being and nonbeing (nonexistent nothingness).

Now, per SM QM, ‘gravity’ is acceleration. Thus, we can infer and partially deduce the relative energy of cosmic rotatory velocity, much the same way we can see, infer, and partially deduce the presence and activity of the galactic and intergalactic E_{PH} field (AKA ‘dark’ energy/matter). However, even if the James Webb Space Telescope shows us 10 or 20 times more of the E_{U^∞} field (beyond the ± 100 billion LY diameter sphere of field-effects now detectable), unless it shows us the cosmic axis and a periphery, we will have no measure of its size. So, equation 2 expresses infinite vastness.

Remember, real scientific method requires measurable and/or provable phenomena. Therefore, even if we get to see the cosmic axis, there is no guarantee that we will ever see its periphery, if there is one. Regardless, the nature and qualities of being and energy are much more interesting than quantities, probabilities, and absurdities. In fact, there is no way to disprove Buddha’s theorem:

The cosmos and its worlds are dreams within a dream (of a primordially beginningless, thus endless and infinitely vast mind).

Still, the field of being expresses and embodies intrinsic metalogical principles enabling, empowering, and sustaining us and the rest of the cosmos. In principle, pure energy is the pure expression and essence of activity and interactivity, enabled by metalogical relativity, reciprocity, vitality, and the power of presence. As Einstein intuited, energy and matter are fundamental, interdependent enabling expressions of cosmic reality (actuality, form, structure, functionality, interaction, and presence). Yet, instead of imagining a ridiculous 'continuum' of curvaceous yet nonphysical 'space-time', we can now see the hyper-luminal field of being as an ocean of hyper-fluid, enabled and sustained by integral, elemental, metalogical principles, energy, and power, enabling and enabled by being's meta-energy. Of course, they are expressions of the purest, subtlest form of energy, metalogical meta-energy. (see defs., Time, & Space)

Einstein thought that there is a cosmic 'medium', like an actual or virtual gas, that enables energetic field-phenomena, such as transmission of emanations and emissions of energetic phenomena. However, he was confused in thinking that "time is motion." That defective over-simplification confuses too many of us.

How? Not only because time is a mental fiction, but also because Einstein failed to mention that motion is an expression of energy. He also failed to say what kind of medium enables it (energy, including hyper-energy & meta-energy). So, clearly, Einstein misunderstood motion, energy, and the field. He was also either confused about enabling principles or else simply ignored them. Sadly, his SM QM successors were equally confused, and/or worse.

A better way to think of the varied frequencies, flow regimes, and pressure gradients of the E_{U^∞} field is by analogy with **a)** dense oceanic salt water, **b)** an upper-layer of fresh water, **c)** Earth's atmosphere, **d)** the Sun's heliosphere, and **e)** the interstellar & intergalactic regimes & regions of energy I.

In that analogy, the ocean and less salty water symbolize the domains of 'slow' luminal and subluminal energy phenomena, where complex turbulent phenomena and interactions create the characteristic substances, elements, frequencies, flow regimes, and pressure gradients. The air of Earth's atmosphere is much less dense, less viscous, more active, more subject to turbulence but of lower-order pressure gradients. The energetic field of the heliosphere, beyond Earth's magnetosphere seems much less dense, more energetic, yet seemingly less turbulent.

The galactic interstellar and intergalactic regions seem much less dense, but with the much more energetic luminal phenomena of the more harmonic super-high and ultra-high frequency regimes, seemingly, with much less turbulence per unit volume. However, as usual, analogies are imperfect and limited.

So, accurately thinking or talking about energy requires recalling that mass and energy density D_E are measures of results of interactivity, motility/vorticity, velocity, momentum, force, intensity, frequency (rates of vibration and/or pulsation), amplitude/potential, and dissipative radiation (net energy loss). Yet, those actualities exist because of and relative to the hyper-energy field (which absorbs seemingly 'lost' field energy in galactic vortices). To understand the nature and dynamics of the $\{MDE^\infty, EM_F\}$ field requires a new way of seeing its dualities, symmetries, and meta-symmetries within its nondual totality. A simple 3-mode model of the MDE^∞ field's density gradients helps:

1. $\pm 1/3$ of the hyper-mode is hyper-dense hyper-frequency E_{PH}
2. $\pm 2/3$ of the hyper-mode is ultra-dense hyper-frequency E_{PH} , and
3. the E_{em} mode is luminal (plasma, RF, UHF, ultrasonic, sonic, thermal, etc.)

Naturally, the 3 regimes have corresponding harmonics and density/pressure gradients. However, if it were physical, we could say that the enabling meta-energy regime (of pure principles and other nonphysical phenomena) is another gradient. Yet, clearly, it is the integral enabling source of the $\{MDE^\infty, EM_F\}$ field and all subsidiary phenomena, including us, minds, science, logic, and mathematics.

Also, from this perspective, relative to the hyper-plasmonic hyper-energy (E_H) modes of the cosmos, all the elements we know as light or heavy (in the E_{em} mode of matter) have inverse proportional energy density. Thus, 'gravity' (G) is a by-product and side-effect of $EM_F + K_F$ interactions and the E_H and D_E modes of the field. So, the more complex elements and seemingly heavier objects actually rise out of and away from the denser energy regimes. In other words, all less energetically dense objects are like bubbles that rise out of the ocean's depths. Exactly, how and why, requires more rethinking of energy.

For example, any kind of explosion in the E_{em} mode of being, requires sufficient pre-existing energy and a causal process. So, even if we say that the E_H of the MDE^∞ mode was a pre-existing field or source of hyper-plasmonic energy (regardless of its origin), still a causal process was required to get part of it to leak enough E to enable any kind of fuel, motion, ignition, fission, and explosion or implosion. However, we may as well say that every thing simply emerged and took form as the field spun, developed, and evolved.

The best candidates for the most primal, elemental, and macrocosmic forms and sources of energy are 1) a magneto-dielectric field, 2) dynamic flow, 3) spin, rotatory motion, 4) vortical motion, and 5) energetic interaction/reaction. Yet, 'early' in the imaginary Big Bang 'universe', initially, nothing interactive existed, so nothing reactive, then not enough of anything to make an explosion of everything out of nothing. So, unless we accept the intrinsic power and co-emergent potentials of natural metalogical principles and the $\{MDE^\infty, EM_F\}$ field of being, we get no spin, no energy, no turbulence, no luminal elemental phenomena, and no explosions, ever. In this view, we can see original spin, energy, and power as causing pervasive microwave energy is because the universe is still spinning.

We need no big bang 14 billion years ago to begin a spherical universe vastly larger than 14 billion light-years in diameter. No need to make up for a missing big bang with ridiculous notions about 'dark' energy & 'dark' matter. Also, as both Nikola Tesla and the great astronomer Halton Arp realized, accepting the realities of spin and vortical flow can eliminate the embarrassing anomalies and problems associated with the illusion of cosmic expansion (caused by misperception, misunderstanding, and pseudo-cosmology).

Mass: As shown in the definitions of energy, matter, particles, force, and spin, "mass" became confusing. Mass is too often confused with 'physical' matter, instead of being understood as a label for what it represents, a measure of integral energy.

In other words, all the modes and forms of ‘internal’ energy that sustain any form of matter, give it its overall measure of mass. So, instead of limiting ourselves to current SM QM and Einstein’s equations, we can more easily understand mass with

$$\text{Eq. 3, } mc^2 \equiv EM_F + G + E_{HPf} = E_{\lambda v}(V_{vT}) \approx MDE_{f\infty}$$

Briefly, although it implies an observer (a being, or consciousness), mass times the speed of light squared is strictly equivalent to the integral combination of the electro-magnetic forces, gravitational acceleration (radiation pressure, dissipation, etc.), and energetic action/reaction of the luminal and hyper-plasma field. So, it also equals the required energy per wavelengths and frequencies times the total vortical velocity of enabling emanation and flow. Of course, the dynamic nature of the magneto-dielectric field’s activity enables rotation, laminar and vectorial vortical flow, but also turbulence, thus vibration, pulsation, and oscillation.

Therefore, also being essentially unitary, changeless, and infinite, it ($MDE_{f\infty}$) cannot precisely equal its luminal/elemental subfields of emergency, form, and so on. Misunderstanding and misuse of “mass” is clearly a proof of defective theory and deficient science. (*See* defs. Energy, Matter, & Elements)

Matter: Naming the basic forms of matter (solid, liquid, gas, and plasma) is a very inadequate definition, especially for a post-modern era of science and ontology.

Naming those 4 modes of matter tells us nothing about the fundamentals of how and why matter is what it is. Likewise, labeling and describing observed properties of the energetic elements of matter leaves us equally unsatisfied. For example, QM and SM physics considers the elements compound phenomena made of other compound phenomena, called particles, composed of an exotic zoo of other particles (composed mostly of ‘empty space’ and undefined energy, plus some spin), and other undefined, unexplained objects and probabilities of QM maths. They do not explain how or why any precursor particles and/or processes could suddenly exist (without cause), then cause other particles, elements, and their properties (without necessary principles, conditions, and processes).

SM SMEs only describe what their QM maths and models let them imagine and think about a tiny fraction of 1% of what exists ($\approx 0.0025\%$). They also ignore or misperceive or deny the vast majority of actual realities and required principles outside their theoretical box of concepts, notions, conjectures, and hypotheses. So, post-modern physics and ontology need a new, holonomic definition of matter and energy, providing optimum explainability, good understandability, believability, reliability, and satisfaction.

Therefore, sufficient definition, necessary for optimal progress, requires starting with the basics. Instead of speculating about ‘dark’ matter and causeless particles (with magic powers that came from nowhere before anything existed), we can consider the nature, essence, and potentials of the intrinsic principles that enable matter, energy, and all other phenomena, including the universe itself. For example, the prime principle enabling solid matter is solidity, a principle of form, a metalogical principle. The prime principle enabling liquid is liquidity, a principle of form, structure, and functionality.

Liquidity and fluidity are also enabled by activity and motility, all enabled by functionality (the enabling metalogical principle). Gaseous matter is also enabled by

activity, motility, and fluidity, principles enabled the primal metalogic of functionality, structure, and form.

The prime principles enabling and expressed by electronic and ionic plasmas are duality, activity, vorticity, fluidity, motility, reciprocity, and magneto-dielectric relativity. They express enabling metalogical principles of being, form, structure, function, and energy.

Thus, we can define 'anti-matter' (positrons, etc.) as contra-rotatory, reciprocal, magneto-dielectric complements of oppositely charged plasmoids ('free' protons, etc.), vortices, not particles. Yet, the fact that so little matter exists can be understood as evidence that principles, energy, and hyper-luminal hyper-plasma are the sufficient necessities of universal being.

Naturally, without all the intrinsic principles enabling being and energy, they could not exist, nor would we. Nor could there be any galactic and intergalactic interaction with what SM SMEs call 'dark matter' and 'dark energy' —without intrinsic enabling principles of the cosmos and its nature. In fact, obviously, the nature of universal being is its enabling, governing principles, which enable nature's ways, modes, and processes. Hence, we can understand, define, and explain matter as macrocosmic and microcosmic field-effects, phenomena embodying and/or expressing universal metalogical principles of being, intrinsic to the nature of its reality.

For instance, a prime principle of all directly observable/detectable matter is physicality. Thus, we can assume that the vastness and potency of hyper-luminal energy has properties that make it meta-solid, meta-liquid, and meta-gaseous hyper-plasma. So, it exhibits 2 main modes of energy density and magneto-dielectric interactivity, misnamed 'dark' energy and 'dark' matter. Yet, hyper-energy, energy, matter, and the cosmos-as-a-whole are emergent vibratory phenomena, full of all the forces and frequencies of energy and matter.

So, we can think of the undetectable hyper-plasmas resonating as hyper-harmonic overtones of Deuterium and Tritium (or of Hydrogen & Helium). That can be known because we can detect and observe the effects of hyper-plasma interacting causally with luminal plasmas, galaxies, and physical elements.

Naturally, all the facts above are possible because of mentality, the prime metalogical principle of being that enables awareness, intelligence, mind, thought, knowledge, and understanding. Therefore, we can also intuit and investigate the nature of the pure hyper-energy that fills approximately $\pm 96\%$ of the detectable cosmos, while enabling and sustaining the other $\pm 4\%$ of phenomena (which is $\pm 95\%$ luminal plasmas).

We can also see the apparent disparity of luminal and hyper-luminal energy (and 'anti-matter') as an expression of meta-symmetry, not super-symmetry. In other words, the meta-material vastness of the hyper-plasmonic field is balanced by the explicate physicality of its lower-frequency (lower energy) luminal/elemental phenomena. (*See* defs. Of Space, Reality, etc.)

Plasma: Astrophysics tells us that plasma amounts to $\pm 96\%$ of all physical matter. Yet, QM cosmologists mostly ignore fluid mechanics, electrical theory, and plasma physics.

So, mainstream QM cosmology's definitions and descriptions of the most abundant mode of matter leave much unsaid and unexplained. Saying that plasma is both electronic and ionic calls for better definition and explanation of electrons and ions. (see

defs., Particles, Hydrogen) However, the verified properties, normal relations, and potentials of ions and electrons discovered by experiments and described by QM physics are already fairly well-known. So, this macro-ontological definition of luminal and hyper-luminal (hyper-frequency) plasmas focuses mainly on the hydrodynamics of their fluidic, ultra-fluid and hyper-fluid modes.

The terms are critical, for the observed nature, modes of flow, radiance, luminosity, and EM activity of plasmas make it clear that their fluidity should be considered the key characteristic necessary for full understanding. For example, radio-astronomy enabled an image of the spheroidal region of the cosmic field ($MDE_{f\infty}$) currently detectable; and it looks like a brain-like web of twisting, writhing filaments, currents of luminous liquid or neural networks. Yet, instead of seeing the hydrodynamic nature of the fluid mechanical sky-ocean of plasmas and hyper-plasma (now AKA 'dark' energy & matter), mainstream QM theorists and 'cosmologists' prefer thinking about nanoscopic sub-particles and probabilities.

Of course, ignoring all the flow, motions, interactions, and colossal forces of the ultra-high energy of the $MDE_{f\infty}$ and its hyper-high-energy action/reaction events makes it nearly impossible to understand how they affect the nanoscopically tiny, delicate sub-fields of the quantum level (of the field). So, to understand it, we must abandon the refusal to consider the realities of the whole of the field, especially its basic, fluidic, and hyper-fluidic nature.

We must also drop the normal SM habit of pretending that the field, its subfields, interactions, and effects exist in isolation. Seeing only imaginary billiard balls in empty space in a mental model prevents seeing the universe's fluidic sky. In the depths of the $MDE_{f\infty}$ and its interstellar and intergalactic subfields (and currents of plasmas, galaxies, galaxy clusters, etc.), its reality and enabling principles make it obvious that all its forms, modes, forces, and events are interdependent and simultaneously interactive.

Therefore, instead of an approach like exploding water to see isolated atoms or molecules, we can consider the principles and modes of magneto-dielectric interaction that enable the fluid nature and hydrodynamic flow of plasmas (and hyper-plasma). Hence, it's reasonable to call the hyper-fluid hyper-frequency regimes (of the cosmos) hyper-plasma, not 'dark' energy/matter. We know that because it causes observable effects of fluid mechanical interaction with and in **a**) galaxies, yet also with **b**) nebulae, **c**) colossal plasma currents of galaxies, and **d**) with giant plasma filaments enabling star-formation. We can also be sure of the hydrodynamics because all of the field-effects in the ± 93 billion LY bubble of detectable phenomena are entering, leaving, and flowing across the field from sources, towards terminal locations. So, seeing and thinking about the cosmos as a vast sky-ocean of magneto-dielectric energy is realistic and very helpful.

Luckily, SM astronomers and physicists looking for evidence of 'dark' stuff, found evidence of fluid mechanical interactions with, within, and around galactic subfields, including this one. Also, since $\pm 96\%$ of the cosmos is hyper-luminal plasma, and $\pm 4\%$ is $\pm 96\%$ luminal plasmas (mostly hydrogenic), and the majority of the other $\pm 5\%$ (of matter) is hydrogen, it seems best to accept the fundamental ubiquity and omnipresent effects of hydrodynamic principles, from the quantum right up to the sub-/supra-quantum, hyper-luminal levels of scale.

So, plasma and hyper-plasma phenomena are fluidic field-effects, enabled and

sustained by the magneto-dielectric energy of the field of being, per its intrinsic enabling principles. So, we can understand the electro-magnetic and thermodynamic forces/effects of plasmas and hyper-plasma as results of their modes of activity (motion, flow, etc.), and their subfields' interactions. (see defs., Fields, Force, Energy, etc.)

Light: Light is an effect of the cosmic magneto-dielectric field ($MDE_{f\infty}$), enabled by luminosity and the other natural principles that enable being and its energy. However, SMQM says that light is electro-magnetic waves and/or points (photonic 'particles' or wavicles or packets or bundles) and/or "rays" of undefined energy (or massless matter).

Of course, SMQM SMEs also seem to know that all such forms/modes of energy are effects of a field of "EM energy" somehow sustained in a mysterious, unexplained nothingness (or $\approx 96\%$ "vacuum") and/or fluctuating yet undefined "electronic fluid" and "dark" energy & matter. They also believe that, like other waves, the waviness of light 'behaves' in a similar manner, but with or without a sustaining medium (an actual 'field' of something that can be affected in ways that cause its waviness). Evidently, SMQM SMEs and fans hate or fear thinking about the fact that waves are conditions of mediums—like water, air, etc.—being affected by forces caused by events, processes, and enabling principles.

All its contradictions and lack of definition maintain mainstream scientism's ongoing crisis of confusion, incredibility, and absurdity. Apparently, its visibility, detectability, measured actions, and effects make light's nature seem self-evident. Clearly though, depending on the consciousness, knowledge, and beliefs of an observer, light is usually not what it seems, even to QM physicists.

For example, while thinking of it as ball-like points or packets of stuff (EM energy and/or matter) or waves of nothingness, it became nearly impossible to understand the various modes of light as emergent effects (emanations) of interacting subfields of the magneto-dielectric field ($MDE_{f\infty}$) of being. So, the ancient 'aether theory' (of a fluidic universal sky-ocean of energy) lost out to spooky maths, illogical geometry, and a new sense of sciencey certainty about fantasy.

Thus, light seems to need a speed limit, despite the fact that waves and their speed happen only in and because of a medium (which does the waving). Mainstream QMs refuse to accept that scientific fact. Of course, they also ignore the fact that c is defined per arbitrary (and deficient) definitions of time and distance, seconds and meters (or hours and miles). So, mainstream believers also ignore 2 other facts: **a)** 'time' is a conceptual construct that thingifies our limited perception of momentary change, and **b)** space is a concept and a perception of an attribute of the $E_{MDE_{f\infty}}$ (field) or of a local ensemble of subfields (a place or event).

Naturally, ignoring those 2 realities makes it impossible to see the modes of light as results of the interactions of the subfields of the $MDE_{f\infty}$ (of its luminal and hyper-luminal regimes). Yet, mainstream astronomers realize that the 'dark' hyper-luminal modes of hyper-plasma are powerful enough to cause the galaxies to disobey the rules of "their SM cosmology" and obsolete QM theory. Still, like fish who never know about water, mainstream believers refuse to admit that their beliefs and rules are deficient, preventing progress to superior science, better education, and a saner civilization.

Elements: The development of “Western” science and society led to the dominant concept of atoms of elements (mostly discovered by miners) recognized by chemists. Yet, the “atom theory” of matter may have began in India more than 3000 years ago. Nearly 100 years ago, Neils Bohr successfully promoted his solar system analogy for atomic form and structure. It required ongoing revisions, supplementations, and remedial efforts that led to ever more (not fewer) problems, contradictions, complications, and anomalies. That led to the current state of crisis and confusion maintained by mainstream QM physicists, cosmologists, et al.

So, to enable real progress to better understanding and results, a revised definition of “elements” is clearly necessary. As explained in the definitions of particles and fields, what we think of as the elements of matter are forms of energy, indeed, subfields of the field of being and its energy (AKA the cosmos). So, the nature of the physical elements is determined by the enabling principles of the field of being (its metalogical nature) and its $MDE_{f\infty}$ (magneto-dielectric field and subfields). The nature of hydrogen, helium, and their plasmoid nucleic ions was explained in their definitions, but more insight can be gained with a more general explanation of current SM ideas and beliefs.

For instance, by SM convention, the ‘atomic weight’ (W_A) of H equals the quantity of its 1 protonic vorticle (its protionic ‘nucleon’). So, its [relative] SM energy density number (D_{En}) is approximated at 0.00008988, apparently much less than D_{En} of all other elements. Yet, the ‘specific heat capacity’ (C_{Hs}) of H is the highest by far, at $14.304 = J/g(K)$. However, $C_{Hs} =$ quotient of potential activity/energy (E_{Pq}), energy/voltage/power. Thus, except for pure uranium (U), H’s basic vibratory frequency and vortical energy (E_V) is $\pm 1,430.4\%$ greater than other elements—even from protactinium (#91) to oganesson (#118)—all having C_{Hs} and $E_{Pq} \cong 0$.

So, obviously, SM QM theorists and SMEs are missing and/or ignoring literally massive elemental realities. For example, uranium’s $C_{Hs} + E_{Pq} = 0.116$ (and $C_{Hs} + E_{Pq} = 0.0081096\%$ of H’s total energy quotient). That is so because the intrinsic enabling principles of U_{Ef} (the universal field of energy) make $\pm 96\%$ of it a hyper-energy-dense domain of hyper-frequency (hyper-luminal) hyper-plasmas. Thus, the seemingly ‘heaviest’ elements of subluminal matter all have C_{Hs} and $E_{Pq} \cong 0$ (zero, relative to the virtually infinite E_{Pq} and D_{En} of the field and local subfields). In fact, potential energy is a valid fact because nature’s enabling metalogical principles make it a property of physicality (itself a primal principle of being), enabled by the nature of energy (the expression of activity and primal functionality).

Yet, for complete analysis, to relate the modern SM elemental values to the hyper-high values of the 2 modes of hyper-plasma (E_{HP}), we can use a rule of thumb rubric and the reciprocals of the values for mass ($m =$ ‘atomic weight’ $W_A + E$ ‘density’). So, per SM theory, 1H has D_{Ea} of 11,135.857 and the SM value of $EMF = \pm 10^{39} > G$ (gravity). Also, the D_{En} of $E_{HPF} = \pm 10^{113} > U$ ’s \mathbf{m} and D_{Ea} . Thus, the actual free energy values for both U and H = $1/W_A(1/D_{En}) + E_{Pq} \therefore$ (therefore)

Eq. 4a: $U_{Ea} = 1/238.02891 \times 1/18.95 (= \pm 0.0002216) + 0.116 = \pm 0.1162216$

Eq. 4b: $H_{Ea} = 1 \times 1/0.00008988 + 14.304 \cong \pm 11,135.857 + 14.304 = \pm 11,150.161$ and \therefore

Eq. 4c: $H_{Ea} \cong 959.388\% > U_{Ea} < E_{HPf} \in MDE_{f\infty}$

In other words, per its nature (its intrinsic enabling principles) ^1H has ± 9.6 times more potential interactivity (E_{Pq}) and intrinsic energy than ^{238}U (uranium) does. That value closely matches the verified order of magnitude variations of elemental energy densities observed throughout the development of modern physics. Yet, recall that the total energy-density (and potency) of the magneto-dielectric field ($MDE_{f\infty}$) is at least $\pm 10^{152}$ times greater than G (g_{fe}) and $\pm 10^{74}$ times greater than EMF events. That explains why free H & H_2 so easily sink out of 'lighter', lower energy regimes, back into the harmonic resonance of the ultra-high-energy modes of the field.

So, the nature and local conditions (of the $MDE_{f\infty}$) keep ^{238}U (uranium) so busy maintaining its form, structure, and elemental activity (as much as possible) its own potential responsiveness (free energy) is nearly $1/10^{\text{th}}$ that of hydrogen. Despite its radioactive dissipation of energy, the nature of ^{238}U lets it resist 'external' field-effects, making it less resonant. Clearly, the massiest, seemingly heaviest elements have the least energy densities because of what we can loosely consider the braking effects of their somewhat turbulent, and slower (unstable) rates of internal flow and vibration.

Of course, E 's nature loathes such restraint, which causes such high-energy emissions (when E wins the struggle to escape confinement). In principle, it could be similar to the corona, coronal discharges, and mass ejection events of the sun. Yet, remember that the elements (etc.) exist in an omni-dimensional sky-ocean of energy, with a triune regime of energy levels (a trinity of vibratory pressure gradients). Also recall that 'our' luminal regime has sub-gradients. They enable and sustain the form and resonance of each element. The more harmonic the resonance, the more stability; and the more dissonance (noise), the less stable the element (or isotope). A very limited analogy is massy complexes of effervescent bubbles rising out of the depths of the field, into the less dense strata of matter.

So, for deeper insight and satisfactory explanations of elemental forms and functions (even without any materialistic analogies, like quantum droplets and pilot-waves on the 3D surface of a pond of QM oil) we can now reconsider the basics, hydrodynamics, and relational potentials of H_2 , O_2 , and He (and superfluid ^3He & ^4He). First, we can now see G effects in massy, relatively chaotic galactic, stellar, and planetary gradients as dissipative side-effects of those noisy, more dissonant subfields. Hence, the proportionally less G effect beyond a planetary or solar (or galactic) subfield is due to the greater resonance of the greater levels of energy density. The acceleration toward less dense regimes (or other less dense forms of matter) is clearly caused by the radiant emanation (pressure) of the triune field (of luminal and hyper-luminal energy) surrounding and sustaining everything and every body.

So, we can think of our weightlessness beyond the interface of Earth's more massy domain as somewhat like floating in super-salty water. Although it seems upside-down and inside-out, we can think of our acceleration out of the denser energy—beyond Earth's noisy, massy (fluffier) gradients—being like bubbles of CH_4 (methane) rising out of the seabed, then breaking free, merging into the atmosphere. We can also understand instantaneous effects 'below' the elemental nano-scale level of form as field-effects of the 2 hyper-dense hyper-plasma regimes.

For example, if we push a pillow or piece of plutonium across hard, smooth ice, mass and size are irrelevant. A point on the opposite side of the object moves

simultaneously, the same distance, at the same rate. If a cue stick puts a spin on a ball, it can be seen on both sides as it moves, but the light reflected by the side spinning away from us has a red shift. Of course, obviously, hyper-frequency hyper-energy is not exactly like water or billiard balls. It exists within and around all things, and must be at least as large as the cosmos. So, clearly, hyper-field fluid mechanics and potentials transcend the limitations of QM field equations and Einsteinian 'relativity' theorems.

Now, in the absence of counter-acting forces and superseding interactions, 'free' H needs to form molecular H₂ because its enabling principles, natural forms, ways, harmonics, and constraints make its central dual-vortices and its quasi-spheroidal EM potential most likely to combine with a twin, forming an entwined (non-entangled) pair. Yet, recall that isotopes and molecules of H are interactive field phenomena, effects of the magneto-dielectric energy continuum of the cosmos (not tiny balls in a magic maths continuum of nonexistent time + perceptual or conceptual space).

Why does being (the universe) like plasma and H and He and O so much?

Remember the totality:

Eq. 5: $(E_U + MDE^\infty) \approx MDE_{f\infty}$

So, the cosmic field oozes energy and interacting, intermingling forces, super-high & hyper-frequency standing-waves, harmonics, interference patterns (of interpenetrating wave-fronts), vortices, laminar flow regimes, and turbulent effects. That is true at all scales, from the subatomic to the biggest galactic vortices and deepest extra-galactic regions of the cosmos. How can we be sure of that? Because we see it in all observations (at all scales) of physical events (field-effects).

Now, recall that O is a writhing, knot-like ensemble of 8 protonic vortices (dual-vortex hydrogen nucleons), but with greater mass-energy ('atomic weight' 15.999) per nucleonic vorticle, and ± 15.89 times the D_{E_H} (standard energy density) of free H.

Why? Obviously, in relation to its 'external' local subfield and the $MDE_{f\infty}$ at-large, O is like a complex of bubbles roiling with twice the massy (entrained/captive) luminal energy and 'internal' hyper-vortical flows of four H₂ vortices ('molecules'). In other words, the resonant harmonics, intensities, and 'scalar' vectors (of 'radiant' emanations) of the $MDE_{f\infty}$ cause the forms, structural properties, functions, and relational potentials that determine the nature of oxygen and its compounds.

So, O and O₂ are so energetically reactive because oxygenic field phenomena are normally in a fragile balance between 'internal' & 'external' turbulence and orderly flow. Clearly, that can only be because of O's nature and its harmonic relationships with its mates and its progenitor, H, and because of the nature and conditions of the all-pervading, all-empowering energy and hyper-energy of $MDE_{f\infty}$ (the field of being).

Now, also recall that the actual internalized energy density of O (relative to hyper-plasma, E_{HP}) is the inverse of SM mass- D_{E_H} values.

Therefore, H is really 16 times more energetic than O, making its relations and bonds with O and O₂ so intensely energetic, powerful, strong, and durable. Hence, they confirm this theory and metatheory (and the fact that nature dislikes a lack of spin and flow even more than it loathes vacuum). So, bear in mind the analogies — with suns, magnetospheres, bubbles, and water — and we see that H₂O is so hydrogenic, so fluid, with such great integrity and 'surface tension' because its nature, form, structural

properties, and functional potentials force it to merge with its molecular sisters, forming a single fluid field that resists dispersion by more turbulent, dissipative local field phenomena.

Also, remember, the expansion ratio of the vapor phase transition of H₂O (from liquid to steam) is 1325:1, while combustion of gasoline (and oxygen) expands at a rate of only 347:1, i.e., a difference of nearly 4 to 1.

That confirms the intrinsic energy and inherent power of H₂ and H₂O—due solely to their nature and the intrinsic metalogical principles enabling and empowering them and the rest of the field (cosmos, universal totality). The hyper-liquidity of super-fluid ³He provides another confirmation of the real nature of elemental and protonic plasmoids (ions/nucleons), their activities, and their intrinsic enabling principles. However, for optimum understanding, we can refer to water again. For instance, though fluid H₂O is an incompressible liquid, it can expand. That is a nontrivial example of the power of the enabling metalogical principles sustaining the nature and properties of the field and all elemental forms of its energy.

In fact, the greatest rise in average sea-level is at Earth's equator, because liquid H₂O can expand. The cause of H₂O's great tropical expansion is a magneto-dielectric field-effect, not the effect of the moon's G ('gravitic' force). Now, remember, a force is an effect of energy, a field-phenomenon. Again, also recall that per SM QM

Eq. 6: $EM_F = 10^{39} \times G$ and that $E = mc^2 = EM_F + G + E_{HPf} \equiv MDE_{f\infty} \therefore$

$$E_{Zp} \equiv E_{HPf} = \pm 10^{113} + EM_F = G(\pm 10^{152})$$

Translation: In other words, elemental energy is the magneto-dielectric field (of light, etc.) plus its integral hyper-plasma energy plus the force of gravity plus the EM electro-motive force. Therefore, since E_{Zp} ('zero-point' energy, at 0°K) is strictly equivalent to the energy of the hyper-frequency hyper-plasma field, hydrogen and water responds to Earth's local field phenomena and other *MDE* events, accordingly. Also, since the energetic domain (field) of hyper-plasmas (E_{HPf}) is in, and around, and enabling all phenomena, while sustaining $\pm 10^{113}$ more hyper-energy than an equal quantity of all the transuranic elements combined. So, clearly, the moon's EMF effects on the interacting heliospheric+galactic *MDE* subfields, and upon Earth and all its field phenomena, is $\pm 10^{39} \times$ greater than the lunar G (side-effect of its interaction).

So, we can also admit that the moon's braking effect on Earth's rotation (reducing its field strength, intensity & magnitude) is primarily an effect of its EM electro-motive force, not gravity (a side-effect of interacting *MDE* events). That causes the stretching of the vortices maintaining H₂O and, thus, the 'swelling' of tropical salt-water (even without petrocene GHGs and extra heat). In other words, *MDE* processes cause the tides and higher tropical sea-levels.

Clearly, instead of using only quantum statistical methods to approximate unintegrated, isolated, and disintegrated elemental vorticals (that spew out of man-made explosions and thermonuclear implosion events, supernovas, etc.), we can understand the actual nature of the elements from the relations and transformations of all 3 forms of H and the 7 forms of He. So, without nonsensical ideas posing as explanations (of uncaused particles and a big bang creation story that 'begins' with an explosion in the middle of nothing, in the absence of energy and something to react

with, to make magic gluons, etc. (and H protons out of those teeny-weeny bubbles of nothing)), the realities can be understood as indicating the intrinsic presence of natural metalogical principles. They enable the meta-energetic and hyper-energetic, proto-physical meta-material, hyper-plasmas, and intrinsic potentials. All the intrinsic principles and potentials of being empowered the original spin, flow, turbulence, and precipitative co-emergence of the elemental forms of energy. They enabled and sustain this lower D_E mode of the $MDE_{f\infty}$ which we can detect directly.

Now, instead of visualizing neutrons and electrons as material particles, we can 'see' the isotopic forms, modes, and ways of H and He. They express the fact that they are fluidic effects of the interactions of the $MDE_{f\infty}$ (and its local subfields) with the intrinsic energy intensities, vorticities, velocities, vibratory amplitudes, and forces generated by the toroidal and vortical flows that give all elemental field phenomena their unique characteristics. We can replace tiny balls of unexplained (and insufficiently explained) stuff and 'dark' stuff with active interfacial vortices and vectorial potentials of interaction, integration, and disintegration of pressure gradients and flow regimes. Again, the apparent emission of particles is caused by perturbations of the 'internal' form, structure, functions, and integrity of the elements, and of (or by) the 'external' local field.

For example, envision a gamma ray as an ultra-high frequency femto-vorticle of hyper-plasma ejected from an ultra-high energy event at an ultra-high velocity. Naturally, it leaves an ultra-high frequency, ultra-high energy 'trail' as its vectorial dual-vortex tunnels through the hyper-plasmonic and elemental 'material' field of universal energy. So, it can seem to behave like an ultra-high velocity particle of stuff, with qualities that give cosmic 'rays' and 'gamma' and neutrino vorticles the properties found by observation, measurement, and maths.*

The actuality is that 'neutrinos' and 'gamma rays' are—like all other energy events—interactive field-effects. All such rays are the result of events that cause penetrative vectorial vortices. Some traverse the vastness of the $MDE_{f\infty}$ and countless interacting, interpenetrating subfields. In fact, when the energy involved is sufficient, vectorial interaction across vast 'distances' can happen instantaneously because what seem to be particulate sources and recipients are not and never were separate from the unitary $MDE_{f\infty}$ and its enabling meta-energy. In other words, in that case, since the source-level core of every form of energy/event (subatomic, etc.) is hyper-luminal, meta-luminal, and unitary, the luminal speed-limit is irrelevant. So, no 'entanglement' of 'particles' ever happened because they never existed as separate, isolated objects (accidentally spinning & vibrating in nothing).

Finally, the nonphysical elements—the intrinsic metalogical principles of nature—enable, sustain, and determine the forms, modes, and potentials of all other things (including awareness, mind, thought, and science). Accepting those facts and realities, we can understand elemental matter as results of the relationships and interactions of the various levels, densities, modes, and forms of nature's energy. That also lets us understand why the universe is $\pm 96\%$ hyper-luminal energy and why $\pm 95\%$ of what we see (or detect) is plasma (protionic/electronic energy). That eliminates the need to believe in accidental, inexplicable, god-like numbers and symbols (G, c, etc.). (see def., Mass & Matter)

* In laboratory experiments, special equipment enabled researchers to create a super-heavy ion (artificial nucleus) of a transactinide (transuranic) element that they then inserted into a near perfect ‘vacuum’ (in an assembly containing a positron detector). That was thought to cause a destabilizing turbulence and “decay of the vacuum” (of the field) and “precipitation” of self-annihilating positron-electron pairs. The choice of wording was more appropriate than realized at the time. However, the result was an example of a quasi-Schwinger Effect enabled by the existence and nature of the hyper-luminal MDE^∞ field (of hyper-frequency hyper-plasma).

Hydrogen: The most basic, simple, abundant, elemental form of energetic matter—other than electron plasma—is ^1H , hydrogen, AKA protium (or proton, the prototypical ion).

All 3 names are appropriate, for ^1H has the unique distinction of being the required essence of water’s fluidity and, also, the most prototypical protonic plasmoid enabling energy’s other, more complex elemental nucleons. In other words, all other elemental nuclei are ensembles of proton (^1H) nano-plasmoids. Some of them have higher energy hyper-plasma flow (in their axial vortices), ‘neutralizing’ their ‘positive’ charge (making them act and ‘look’ like neutrons). Now, recall that the activity and effects of ‘dark’ energy/matter demonstrate the omnipresent reality of the hyper-luminal (clear light) of hyper-plasma. So, just as every proton is a nearly identical ‘ion’ of ^1H , all ‘neutrons’ are really higher energy protonic plasmoids, as in ^2H (deuterium) and ^3H (tritium).

There are other previously unexplained facts and causes for all the distinguishing properties and actualities of hydrogen. For example, its unique priority as the most primitive element of matter is no accident. So, the nature of $^1\text{H}_2\text{O}$ being as it is, the most basic expression of liquidity (the principle), fluid dynamics is also called hydrodynamics. Thus, all energetic phenomena, interactions, and field-effects can be described with the terms of fluid mechanics.

Another actuality of hydrogen is its magneto-dielectric susceptibility to axial alignment with electromagnetic subfields. That confirms the pervasive magneto-dielectric field and intrinsic forces that enable all hydrodynamic flow regimes. So, that enables energetic events at all levels and scales of phenomenal form, structure, function, complexity, and actuality. In other words, the hydrogenic properties of hyper-plasma, plasma, and elemental energy flow enable the more complex forms of elemental matter.

Now, in its ^1H form, hydrogen needs no ‘neutron’ because its protonic vorticle (and its internal hyper-plasma dual-vortex) is the perfectly balanced, massy, vortical flow phenomenon enabling all protonic nano-plasmoid form, structure, function, and activity. So, that makes ^1H the prototypical nucleonic vorticle that enables more complex elemental forms (of matter). In those elements, due to meta-fractality and nature’s other primal principles, the electronic interfaces of protonic domains merge, somewhat like the merging of (molecular) H_2 (or O_2). Hence, per the enabling principles, depending on the conditions and interactions of the intra- and extra-elemental subfields and the quantity of positive and/or neutral protons (in an elemental ensemble), the nature and energy density of the field (of hyper-plasma) permits up to 8 electromagnetic subdomains per multi-protonic element.

Briefly, a plasmoid ‘neutron’ of ^2H or ^3H is really the hyper-luminal vortex that flows and spins faster than the luminal energy vortex it enables and sustains. A proton’s magneto-dielectric (MDE) force and power ($\text{EMF} + V$), and its relative non-neutrality is

due to meta-symmetric relativity, asymmetry, interactivity, and the lossier bi-directional vortical flows of its hyper-luminal axial core. So, the energy/pressure/flow regime of the $E_{em} + MDE^\infty$ field sustains ^1H protons (from within and outside its elemental domain). Clearly, the principles enabling basic protonic plasmoids that enable the 3 isotopic forms, structures, and functions of H, also enable the other modes of the other elemental nuclei.

Hence, hydrogen is rightly considered the prototypical kernel of all other elements. So, it makes sense to assume that its 3 forms are due to its resonance with the 3 fundamental frequency domains of the field: the basic vibratory/radiant energy of our mode of being, and the 2 hyper-plasmonic modes of the $MDE_{f\infty}$ (field). That and its 3 forms/modes, structural configurations, and functionalities also reflect hydrogen's primal expression and embodiment of primal unity, duality, triality, trinity, triadic and quadratic structural logic (in $^\infty 3\text{D}$).

That is so because its nature and basic hydrogenic morphology physically, energetically unite primal singularity and duality. Hence, deuterium, ^2H or D, embodies and expresses primal triality with 1 protonic vortical and an equally powerful, 'internal', electromagnetically 'neutral' dual-vortex of hyper-plasma, with only 1 coronal-interfacial electronic potential.

In other words, its more massy internal flows and activity gives ^2H approximately twice the apparent field strength of H (while remaining relatively stable). So, it seems as if it has an extra 'nucleonic particle' (a neutron). Free tritium, ^3H or T, embodies and expresses primal quadrinity and tetradic morphic-structural logic, with 1 protonic (dual-vortex flow) and, apparently, 1 electron (with 2 coronal energy potentials).

Obviously, the 'local' energy density, vibratory and rotatory phenomena, harmonic resonance, turbulence, and pressure (of the MDE^∞ field) pump H into its less stable, unsustainable levels of energetic activity, ^3H (or ^2H). Thus, when ^3H loses enough 'neutral' hyper-energy and merges with another ^3H plasmoid, it becomes the more massy He. That shows that mass is simply a measure of entrained, constrained energy sustaining the forms, modes, and ways of ions, elements, plasmas, galaxies, stars, planets, and other forms of energy. The rarity and dissipative instability of ^3H confirm the intrinsic principles and properties of H that sustain its form, priority, and status as the prototypical element that resonates with the most powerful, pervasive frequencies of the MDE^∞ field.

Thus, ^3H 's 2 'phases' (forms & modes) and levels/ways of activity (energy density, intensity & harmonics) clearly confirm causal interaction with the 2 major modes of hyper-plasmas (misnamed 'dark' energy & matter).

Why and how? Because all forms, modes, ways, and effects of energy are enabled and determined by their intrinsic principles, enabled by the fundamental metalogical principles of being. So, this view of elemental actuality accords with the abundant evidence of nature, form, structure, functionality, and hydrodynamics of the tri-modal field of E (and its semi-cubic/tetramorphic hyper-physical infrastructure).

Helium: He, the element, is a model morphic seed-form of H_2 (the natural molecular form of hydrogen). However, though He (like H_2) is an elemental embodiment and expression of its intrinsic enabling principles (of natural metalogic). Its 9 forms (isotopic

variants) are field phenomena enabled by the nature and potentials of MDE^∞ energy and co-emergent interactions of and with the bi-modal E_{PH} (hyper-plasmonic) domain of the actual field of being (U_A).

This approach to elemental ontology is supported by the SM finding that, as radioactive elements decay, they emit helium atoms. Yet, modern SM doctrine fails to explain why, and what that really means.

What it means is that, just as singular vortices (atoms) of hydrogen (and its enabling hyper-fluid hyper-plasma's hyper-trochoidal, toroidal and hyper-paraboloid flows) like being coupled with a vortical double, helium vortices like being coupled with at least one partner. So, clearly, the 2 nondual protonic vortices of helium like to be coupled in their more materially resonant flow regime, determined by the local and universal field phenomena and their nanoscopic, picoscopic, and femtoscopic effects. For example, as we see with hydrogen and its [isotopic] variants, the 9 heliums embody and express the primal, enabling, characteristic principles of energetic elemental matter that make helium 'look' and 'act' like helium.

We can also relate the 2 modes & density regimes of hyper-energy/matter to hyper-plasmonic hydrogen and hyper-plasmonic helium. Whatever the case, we cannot verify that conjecture directly. Yet, we can only analyze the circumstantial evidence. We start by looking for reasons why hydrogen needs no neutron, intuiting what neutrons and electrons really are.

So, as claimed for hydrogen, a lone protonic vortex's axial flow is enabled by the neutral, contra-rotatory, bidirectional, double-helical vortices of E_{PH} flow. However, in the nuclear domain of He, the resonant harmonics, pressure gradient, and surrounding turbulence of the MDE^∞ field enforce the characteristic form interpreted as neutral vortical plasmoids coupled to the 2 protonic vortices of the helium ion. Yet, if such a neutral complement of protons exists as an independently, concretely real object, then there should be a satisfactory explanation, including causal factors.

Of course, these theorems and metatheorems can be falsified, like all truly scientific theorems, but neither SM cosmology or physics offers a satisfactory substitute, nor a valid disproof. In fact, like all valid metatheory congruent with actual universal phenomena and their nature, the metatheorems presented here are falsifiable only with fallacies. Thus, this work of metatheory presents viable, valid, logical and metalogical definitions, causes, and explanations of enabling metalogical principles.

For example, the $(E_{em} + MDE)^\infty$ domain of the magneto-dielectric field of being sustains H_2 and all forms of He as the lightest forms of elemental matter (E_{em}). However, relative to the hyper-plasmonic mode of the field of being, the dyadic 'positive/negative' EM charges, flows, interactions, and forces of the $(E_{em} + MDE)^\infty$ field are counteracted or canceled by the opposite contra-rotatory flows and spins of the hyper-energetic E_{PH} mode of U_R (universal reality). That makes hydrogen the most energetically resonant, relatively energy dense form of elemental energy. Thus, H sinks into (*i.e.*, escapes) the oceanic hyper-energy of the extra-planetary field more easily than helium.

How and why should that be possible? We only need to observe the macrocosmic and nanoscopic evidence, and consider the actualities with an open mind, free of obsolete hypotheses, doctrines, dogmas, and shibboleths of QM cosmology. We can also review the absurdities of current QM physics and faux-cosmology. (see defs., Plasma,

Fields, Energy)

Measure: So far, the definition and reality of measurement has been largely ignored by almost all SM QM researchers and many mathematicians. So, general understanding of the field of magneto-dielectric energy (MDE_{fco}) was prevented.

Worse yet, not understanding the nature of measurement supports misunderstanding of MDE_{fco} energy events, numbers, consciousness, and reality. That occurs mainly because the consciousness (conceptions, perceptions, and knowledge) of most researchers causes some confusion of resulting data and interpretation with the phenomenal reality studied. In other words, failing to know and bear in mind the reality of measurement always supports the error of thinking and acting as if our numbers are what they quantify, our maps are the territory, and models are as valuable as the fraction of reality they partially approximate.

For example, a measure of a thing or process assumes some consciousness of it, without any explicit account of how little of it is perceived. Clearly, we normally fail to realize how much of what we observe remains unknown or unknowable. Currently popular mainstream SM QM and 'cosmology' are perfect examples. On the other hand, macro-ontology lets us approximate how much of reality is either unknown or unknowable per the rules and limits of mainstream QM. Its view equals less than $\pm 95\%$ of $\pm 5\%$ of $\pm 4\%$ of universal totality, which equals ± 0.0025 of 1% of reality, per the SM's own results and measures (of quantities).

Actually, QM deals with far less than that, because it totally misses the huge percentage of qualitative realities (and other nonphysical elements of reality) that make the universe, being, and life what and as they are (in each ever-changing moment of presence).

Observation: Observing is an event and process enabled by perception, which is enabled by sentient being, awareness, conscious intelligence, mind, and embodiment (expressing and enabling naturally intrinsic principles: mainly actuality, mentality, activity, and awareness. However, perception and observation may be inaccurate, illusory, and limited by existential conditions or the conditioning of observers, and the limitations of their minds and senses. In other words, there can be no isolation or separation of subjects and objects, or self and world, microcosmic phenomena and universal being-as-a-whole. So, clearly, the critical importance of defining observation and, hence observers, is necessary for all the sciences.

That is true because understanding observations and objects requires a good understanding of the actualities and limitations of our observations. For instance, Einstein's famous reduction of energy and matter to $E = mc^2$ required and assumed the existence of observation, a conscious observer, the observer's frame of reference, and space, and time. Yet, post-Einsteinian physics lacks definitions and optimal recognition of all those terms and basic requirements. So, to this day, Einstein's postulates are normally accepted (as necessities of life, science, and maths), without looking deeply into what enables their actualities and potentials.

For example, an astronomer may observe an unexpected phenomenon that proves the basics of QM physics and cosmology absolutely invalid. Yet, in those cases, the

astronomer has no concepts or valid theory to 'make sense' of such phenomena. So, she/he misinterprets what is really happening, or else calls it an anomaly, then refuses to question the basics of QM cosmology. Consider a more ordinary example: We can misperceive something, yet trust that our inaccurate or incomplete observations and presumptions are valid, correct. Obviously, that problem causes many controversies, conflicts, false dichotomies, and bad or inadequate theory.

Space: Space is a word representing our perceptually derived experience or concept of explicate dimensionality (a subsidiary principle and property of form). So, "outer" space is neither nothingness nor outside anything.

Space is not a '4D' continuum of empty geometry+time; and dimensions are nonphysical ideas or measurements. They exist only for and "in" minds, experiences, perceptions, illusions, and ideas (etc.). Space is also a virtual property of various actual and potential expressions and/or embodiments of dimensionality and locality (two of the properties and subsidiary principles of form, the metalogical principle). So, we see telescopic images seeming to support notions of 'dark' energy and 'dark matter' filling ±96% of a mostly empty universe (the field of being between and within galaxies (and everything else)). Yet, even Higgsians now admit that 'space' is not empty. In fact, it is every place, everywhere, never outside of or apart from things, entities, energies, and meta-energy. We can rely on that because good astronomy shows that the 2 undetectable forms of energy (the transparent 'dark' kinds) interact with luminal forms of energy: plasmas (the light, slower kind), nebulas, and galaxies.

Yes, hyper-luminal energy's frequencies are beyond technological detection and measure. So, to us, what seems dark and empty is simply invisible, transparent. That theorem is also supported by experiments with 'synthetic' ultra-heavy elemental nuclei. They can cause breakdown (perturbation, turbulent slowdown) of the vacuum (the hyper-energy field), causing precipitation of electron-positron pairs (etc.).* Laboratory experiments verified work that confirmed the existence of the indirectly detected field (MDE_{∞}) of hyper-plasma (E_{PH}), the hyper-luminal energy of being. Wikipedia's article on the results of QED and SED helps:

“...both [quantum electrodynamics](#) (QED) and [stochastic electrodynamics](#) (SED)... with the principle of [Lorentz covariance](#) and with the magnitude of the [Planck constant](#) suggest a much larger value of 10^{113} joules per cubic meter.^{[4][5]} This huge discrepancy is known as the [cosmological constant problem](#).”

An ultra-colossal problem, indeed, like an elephant the size of the cosmos in a room the size of a QM-cosmologist's head. Yet, early work in QM physics estimated the energy-density of the emptiest cubic centimeters of the universe at 10^{80} or 10^{100} greater than the energy density of the densest physical element. That is vastly greater density than 10^{-9} Joules per m^3 of mostly empty space. Of course, that estimate was calculated without including Planck energy density and hyper-energy density. So, clearly, no part of the field of being is empty or lacking energy sufficient for enabling all subsidiary, constituent phenomena, processes, and events.

Yet, more importantly, the findings of QED, SED, and radio-astronomy prove that our old notions about ordinary matter and reality were severely deficient, mostly defective. This post-modern theory and metatheory of macro-ontology and natural

metalogic resolves residual QM SM deficiencies and the cosmological constant problem.

- * Numerous experiments produced visible traces of mutually annihilating phenomena (interpreted as “electron-positron pairs”) emerging from what had previously looked like “perturbed” spaces without electrons.

Time: The universe is a momentary event, always happening now. Time is a concept and an illusion enabled by our minds, perceptions, changes, and duration. Those experiential phenomena are enabled by the principles of actuality, activity, mentality, physicality, form, structure, functionality, and semiosis.

So, time is not an independently real, universal actuality or thing that exists outside our minds. Thus, reifying (thingifying) time, while ignoring its illusory existence may make good scifi possible, but makes good physics impossible. Unreifying time by defining it as half (or $\frac{1}{4}$) of an impossibly curvy, totally empty ‘space-time’ continuum could never work.

For example, ‘space’ is a psychosocially derived construct enabled by principles and properties of form. Like time, perceived space is an illusory product of limited knowledge. So, combining illusory time and illusory space—to create an impossible fabric of curvaceous yet $\pm 96\%$ empty cosmic geometry—is as foolish as it is confusing.

Actually, the universe exists momentarily, as it always has, as a constantly changing event. The very reliable principles of nature enables and sustains its constantly changing events, subevents, processes, living beings, and all other phenomena. Otherwise, it would all get stuck, stagnate, or else never be here and now in any definite, durable form. So, the only necessary and sufficient continuum of universal reality is the continuum of being, energy, and the meta-energy of its enabling principles. Also, that makes the only real ‘time travel’ via either memory or dreaming, or as a mental field-effect of universal being (and its intelligence and infinite potential).

We can be sure of that because being’s totality is constantly changing every form of being and energy in its current moment of presence. Its intrinsic principles, properties, and interactions enable, cause, and limit the changes.

In other words, the universe (and its ever-changing condition) and our consciousness are co-emergent phenomena (of being) happening in the only place and time that exists, here, now. The past (a previous condition of universal being) always was and is being constantly transformed into being’s current moment of presence. All former states, forms, conditions, and physical causes of physical being no longer exist, because they were recycled into this moment of being and its current condition.

Addition: Addition is the summing or combination of units or components (of a composite thing or set, or of a group or series). An additive operation combines units or quantities or numeric symbols without multiplication or exponential expansion.

So, adding 1 thing and another gives a sum of 2, a new quantity or thing. So, $1 + 1 + n$ things produce an aggregate of 2 things plus the amount or quantity symbolized by n , for a new aggregate sum. Addition may also involve symbols of fractional values and/or complex quantities that include quotients of implicate division and/or products of multiplication and exponential expansion.

An important exception to the above is the addition of a sperm to an egg, when the combination of their half strands of DNA, become a new example of oneness, unity,

integral multiplicity, exponential expansion, and singular identity, a new being. That exception also proves the primordial interdependence and inseparable primalities of unity and duality.

Thus, Russell & Whitehead taking nearly 300 pages to prove that $1 + 1 = 2$ was as excessively illogical as it was misleading. Of course, Kurt Gödel's famous proof of his incompleteness theorem supports that truth. (See the defs, of Unity, Duality, One & Two)

Symbol: A symbol is an object of consciousness, a virtual conceptual construct that may be expressed or embodied as a semiotic object of perception and cognition. So, though a symbol may be a purely mental object of consciousness, it can be expressed with an actual physical or graphical object or image, or sounds, names.

For example, numbers can be represented by spoken or written symbols, or depicted or embodied somehow. They can encode representations of values, quantities, entities, or anything else. So, essentially, a symbol is a semiotic device existing for the sake of communication, but with no actual or logical existence separate from or apart from the meaning it represents. Nor do symbols exist apart from the consciousness of a perceiver or conceiver and communicators.

Zero (0), a numeric primitive (symbol of absence), is a uniquely singular, logical reality and label. When we think of the nature of a womb, then **0**, the numeric symbol of absence or nothingness and nonbeing is a perfect symbol of the neutral origin of all numeric forms. Zero—always relative to something that exists (universal totality, etc.)—also symbolizes both negative potential, pure neutrality, virtual and ordinal absence.

So, **0** deserves the unique distinction of being the one and only virtual expression of neutral primality. For example, only **0** best expresses the numeric origin of both sides of the number line, and the central point of coordinate mapping graphs. There, **0** has no actual presence, nor any positive or negative identity. That confirms its proto-primality and uniquely logical nature. Unlike the mathematical objects commonly believed to be 'black holes' in 'dark' stuff (called 'space' or curved "space-time"), **0** is the purest, truly naked singularity, hidden in plain sight.

On the other hand, consider **1**, a symbol of singularity. It can also represent positivity (or truth), unity, individuality, identity, presence, and original wholeness. Yet, the presence of anything implies and requires absence, even the absence of nothingness, and the relativity of nonexistence and being.

One: "One" and **1** are not simply numeric concepts and symbols. Natural oneness was originally all-inclusive, and preceded the mathematical expression of it.

Thus, a single identity or form (of some kind of thing or being)—or the unity of a vast set of truly identical things or entities—is and was always itself, not another unit of some other kind. A natural form of being, whether actual or virtual, is present and knowable because of its unique identity, its singular embodiment and/or expression of the actuality and integrity of its individuality. Yet, in principle, the original, universal one-ness of all things and beings is enabled and sustained by its primal primacy and its primary priority.

That may seem paradoxical, unless we recall that all things and beings are subfields of the field of being, enabled by its energy and nature, its intrinsic enabling principles.

Consider the pervasive expressions and instances of oneness, singularity, individuality, identity, unity, and uniqueness (including the cosmos itself, and each new moment of its presence). The elements of the pre-existent field of phenomena (the events of life's present moment) were and still are all logical and/or metalogical in nature. So, each part of any composite thing is an expression of its own singularity. Thus, the primary ordinality of 1 implies its priority and its unique expression of elemental wholeness, the completeness of being's unity, and its cosmic integrity. Clearly, 1 deserves priority as the primary numeric expression of positive primality. The best definition of primal numbers (with values greater than 5) proves the prime primacy of 1:

Primal values of $n \subseteq \mathbf{N}_p \supset p_x = n$ if its only factors are p_x and 1.

Translation: All primal numeric values are a subset of or equivalent to \mathbf{N}_p the superset of all p_x (primal numbers). So, if a number has only 2 factors (p_x and 1, divisible only by its own value and 1), then it is a member of the primal superset. Of course, showing that any primal p_x is not a multiple of any preceding whole number sum of $n + 1$ validates that definition. Also, like any other primal number's value, p_x can represent the value of 1. We can see that also verified by $1 + 1$. Still, this logically superior definition conforms to the subverted definition (where $n_x = p_x$ if its only factors are p_x and 1). Further, because both nothingness and duality are relative logical complements of unity, the nature of 1 implies both 1 and 0, and 1 and 2. Then, 0, 1, and 2 enable and imply 3, which symbolizes the primary set of all manifestations of triality, and of $1 + 1 + 1$ and all relativities of $0 + 1 + 2$, all depending on the logical primality of 1.

Yet, we can see that 1 of anything is not anything else; also that singular phenomena existed before humans and maths. So, the natural primality of 1ness preceded its existence as an element of maths. Its numeric value and priority are virtual yet, as a transfinite expression of formal semiotic potential, 1 is inseparably related to cosmic unity-as-a-whole (and primality).

Two: Primal duality enables and relates to two (2), the number and its graphic symbols. Like all other numbers, 2 does not exist in any nondependent way, separate or apart from the other numbers, numeric logic, natural realities, entities, quantities, and values to which it relates. The first post-unity primal number, 2's primitive primality can be seen in its direct relationship with 1 and 3, with no derivative nonprimal numbers intervening. 2 is also the first primitive primal that can symbolize the existence of something other than the singular totality of natural unity.

All psychophysical instances of duality, dyadic primality, nondual relativity, and polarity are embodiments and/or expressions of the generative principles governing the nature of being and explicate actuality. Hence, the complementary relativity of 0 & 1 (or nothing + something) makes them primal expressions of dyadic unity, 2ness. The numeric logic of 2 is a consequence of the generative, morphic, structural, and functional principles that make it as universally potent, primal, and important as 0 and 1.

Three: The first primitive primal number representing the existence of something other than unity, duality, and dyadic primality is 3, the symbol of triality and triadic phenomena.

All psychophysical instances of triality, triadic primality, and their relativity are all

embodiments and/or expressions of the primal nondyadic (triadic) symmetry (enabled by nature's metalogical principles of being) and its intrinsic, explicate multiplicity. The numeric reality of 3 is virtual.

As with all other numbers, 3 and 3ness do not exist in a nondependent way, separate or apart from the natural principles, entities, quantities and values they enable and/or represent. The relativities of 0 and 1 and 2 and of 1 and 2 and 3, used as groups or sets, make them expressions of triadic primality. As the first post-dyadic primal, with no nonprimal sums or products preceding, the primitive primality of 3 can be seen in its direct relationship to 0 and 1 and 2.

As a trinity or triadic set, the first 3 primitive integers are each a virtual negation of 3 (signifying absence of explicate 3ness). Yet, 3 is the result and cardinal value of the set. Its triadic primality and being the first nondyadic (odd) number > 1 , also expresses its positive primitive primality (and its relationship with unity and duality). The absence of an intervening whole number between 2 and 3 is an expression of the primitive primality of the primal numeric triad and the principles of triality and trinity.

Clearly, the nature of triality (triadic primality) enables and expresses the actualities and potentials of complex multiplicity and all geometric phenomena. Thus, forms, structures, values, numbers, and quantities (greater than or beyond 2) are enabled by 3. For example, we may find that cellular intelligence can use many levels of high-bandwidth EM communication code, but trinary code enables and sustains many organic chemicals that enable and sustain countless quadrillions of viroids and virions on and in the Earth and its oceans.

Virtual numbers: Calling some values and numbers “imaginary” or “transcendental” or “real” or “rational” or “irrational” or “infinite” is confusing. All numbers are conceptual, virtual. They may exist as products of realization or of imagination and/or visualization. They can appear as symbols, via intuition and/or memory.

However, numbers and symbols are infinite, yet definite, and some can more usefully be called or considered virtual numbers or values. For example, in the domain of maths, the value of I , the value that, when squared, equals -1 , is called imaginary, but it is clearly not. It is also no more abstract than any other numeric or symbolic abstraction.

In fact, in the obsolete context of antique maths, I once seemed an absurd impossibility. Yet, the useful potential of I and other exotic symbols of virtual values make them everyday necessities of technology, business organizations, cultural institutions, and modern science. Such virtual values, numbers, and phenomena exist because the metalogical principles of being enable the totality of this universal moment (of life).

Yet, bear in mind that being and life never make circles with “transcendental” ratios and fractions. What we call “ π ” (or pi) is simply a symbolic referent, an inexact approximation, a numeric concept, and a rationalized label that transcends nothing but nonbeing. Still, obviously, all numbers, numeric values, and ratios are virtual phenomena.

Intrinsic numbers: Numbers themselves (not the semiotic symbols we use) are virtual objects of conscious realization or intuition, and of communication. Yet, some

numbers—classified as irrational or transcendental or imaginary or real—closely approximate or relate to various natural or mathematical phenomena.

We therefore know of formulas, equations, expressions, ratios, and constants useful in physics, engineering, astronomy, and so on. For example, the ratio called pi (π) is intrinsic to the geometrical construct we call the circle, among other things. So, π is intrinsic to our system for measuring what we call “the passing of time” (etc.. on a spinning planet) and for mapping Earth’s geography. Yet, if geometers in ancient Mesopotamia based their number system on anything other than the number of bones in their fingers and toes, then hours, minutes, and circles might not relate so intimately with 60 and 360; and trigonometry might be very different, if not nonexistent.

Anyway, the fractional ratio of the circle’s circumference divided by its diameter is close to perfect, but still not exact. Perfect circles exist only in purely conceptual geometry, but it is a natural product of human mentality, a natural reality (in principle, at least).

So, it seems odd to call a logical ratio an irrational or transcendental number. We may as well call them either virtual or intrinsic numbers. After all, numbers, terms, and expressions of maths are all virtual and actually intrinsic to the paradigm of maths, existing only in our minds. Hence, numbers, symbols, and expressions relating to natural and virtual phenomena (relevant to the paradigm of what was named “continuous maths”) could be called natural. Yet, so could natural whole numbers referring to discreet phenomena, like 2 babies.

To minimize confusion while supporting clarity, instead of calling them natural, or rational, or irrational, or imaginary, or real, or transcendental, we could call them all special or virtual, if they relate only to virtual phenomena. If they relate directly or are integral to descriptions of natural and/or discreet phenomena, we can think of them as intrinsic numbers. For example, we can consider the Golden Ratio, Φ , Phi (pronounced like fee), and similar objects of maths as symbols of naturally intrinsic numbers or ratios (or constants).

Phi, an ideal example, has the virtue of being intrinsic to pentagrams, pentagons, and other objects of geometry, trigonometry, and the Fibonacci sequence (etc.). It also closely approximates many observable natural forms and patterns. So, like pi, Phi could be considered intrinsic, virtually and actually. Then, if the language of maths became much easier to understand, explain, and remember, even ordinary children might enjoy thinking and talking about numbers and maths.

After all, maths is a language. So, with more logical names and terms, teaching and doing maths, science, and engineering may be more effective.

Phi: The ancient Greek letter “ Φ ” (Phi, pronounced “fee” in English)—the essential key of the metamaths of Pythagorus and Plato—can be understood as the origin of modern number theory and post-modern metamaths. Made famous by Fibonacci and his famous series, Φ is the ratio of $1:1.618033988\dots$ and it to Φ^2 (and it to Φ^3 (and $4.236067977499\dots = 1/\Phi^3$)), the Golden Mean, Golden Ratio (or Golden Section); and the Golden Spiral generated with Φ closely mimic the structural logic of nautilus shells (etc.).

The logical congruency of Φ ’s unique expressions of geometric::numeric logic, nature’s formal-structural dynamics (and the solar system, H_2O , DNA, etc.) verifies the enabling metalogical principles of being. For instance, imagine the wholeness of cosmic

unity as a line or time-line. Now, we can divide it into 2 unequal segments so the larger segment = 1 and the smaller segment = 0.618033988...(φ, “phi”). If we then subdivide one of those segments in the same way, we can describe the relations of those segments as Φ to 1, or as 1 to φ, where the larger segment = 1 and the smaller segment = 0.618033988...(notice the fractality, the principle of self-similarity enabled by relativity, symmetry, integrity, reciprocity, identity, etc.).

That metatheorem is supported by the nature of Φ and the qualities and logical properties unique only to it (among the infinity of other numbers and ratios). For example, the actual triangular form of H₂O (at rest state) is identical to the triangle formed by joining any 3 adjacent vertices at the perimeter of a pentagon (or very nearly so). Those angular relations are ruled by Φ and φ. However, naturally, H₂O always bonds with at least one other mate, coupling strongly.

That form and structure appears to explain the fluid structural integrity and qualities of water. It is now known that the double helical strands of DNA’s atoms spiral around their central vortex (re: πD) with a twist of 36° (forming a double pentagonal, decagonal cross-section). Now, recall that DNA floats or swims in a broth, simmering in all the frequencies of our cells’ subfields, within our bodily subfield, in the Earthly and Solar subfields of the cosmos. Also recall that, the sub-elemental level of energy, form, structure, and functioning enables, empowers, sustains, and affects all the levels, forms, and modes of being. Even if ambient conditions (turbulence, etc.) make the angles and values differ a little (from Golden Ratio), the nature of Φ:1 and its natural relativity remain essential and durable.

Detailing all the many amazing correspondences of Φ and the morphic relational dynamics of the solar system (and the rest of being’s nature) would be too lengthy for this explanatory definition. Yet, recalling the numeric logic helps. For example, summing the values and results of operations with the powers and reciprocals of Φ and φ demonstrate the *a priori* nature of numeric logic and the natural principles enabling it. The fact that the numeric value of Φⁿ is logically equivalent to 1/Φ⁻ⁿ verifies the basis of holonomic number theory, trigonometry, reciprocity, relativity, integrity, identity, and equality.

Φ’s unique identity and qualities also makes it, in principle, validate the functional logic of maths in general, its enabling principles, and the primal metalogical principles of being (its nature). So, the nature of the ratio we label with Φ makes it an incommensurable, irreducible, incontrovertible expression of nature’s creative, morphic, structural, and functional principles.

Primals: Primality is a principle that exists within and far beyond maths. Calling natural whole numbers divisible only by their own value and 1 “prime” is overly simplistic and confusing. Primal numbers N_p (or p_n or n_p) are those positive whole numbers that express the primal integrity of unique numeric identity, individuality, and unity.

The most primitive numeric expressions of positive primality are symbolized by 1 and 2 and 3. Yet, uniquely, 0 expresses neutral numeric primality. For example:

$$0 \div 0 = 0 \text{ and } 0 \times 0 = 0 \text{ and } 0 + 0 = 0 \text{ and } 0 - 0 = 0$$

None of the results of those equations are either positive or negative, because the

logical negativity of 0 is neutral. That makes 0 a uniquely singular expression of primal integrity and nonbeing (nothingness). So, together, nonbeing and its primary logical complement, unity (or 1), express the primality of 2 (the numeric symbol of primal duality). Original primality and unity are expressed by the complementary nonduality of action and stasis, change and constancy, form and formlessness, or truth and falsehood (reality and unreality). So, we can use 1 and 0 to symbolize all primordial existential couplets or any other dyadic phenomenon.

The numeric primality of 2 also reflects actual duality in unity expressed in DNA-RNA, cell division, sex, birth, and all the other relative polarities of being, including that of presence and awareness, body, and mind. Clearly, all subject-object phenomena express dyadic primal relativity of identity and duality (or infinity). The nondual 'self-other' relation, simply symbolized with 2, also represents the logical nonduality of symmetry and asymmetry, simplicity and complexity, singularity and multiplicity, unity and totality. Other than 0, 1, 2, and 3 are the primals most expressive of purely primitive, numeric primality.

That can be realized after recognizing the nature of triadic primality as a potential of the nature and presence of duality and dyadic primality. The primary expression of diversity and multiplicity is symbolized by 2. Yet, where there are 2 objects or events, in principle, there must also be 3, virtually, at least by logical implication.

For example, the primary expression of complexity is intrinsic to 3, which we can see in the presence and relationship of 0 and 1 and 2, and all other expressions of predominant triality, trinity, and triadic primality. The primal presence and effects of 2ness and duality infuse and inform the logical backbone and results of work with numbers. Thus, duality and triality are intrinsic to the primal pairs ('twin primes'). So, all primals greater than 5 (in progression $n + 1 \dots \rightarrow \infty$) come before and/or after a multiple of 6. So, the best definitions of primals ($n_p > 5$) are:

N_P are whole number products of $1 \times n_p$ if $n_p = 5n + 1$ or $6n + 1$.

The set theoretic definition is: $\exists n_p > 5 \in \{N_P\} \supset p_x = 6n \pm 1$ if (and only if) the only factors of n_p are p_x and 1.

Composite numbers: The oddly named 'composites' (C_n or n_c) express numeric nonprimality and complexity. They can symbolize all composite phenomena of logical relativity. However, all numbers are composed with other numbers, most simply by adding 1 to any other number. So, all the relations, functions, processes, entities, identities, and activities of all domains and levels of being can be symbolized and related to nonprimal numbers with appropriate attributes, forms, structure, functional potentials, and properties.

That is so because all phenomena are both unique and relatively dependent upon something else. Essentially, the cosmos-as-a-whole (AKA being), is the original, perfectly prime phenomenon. Hence, the nonprimals can express formal and structural symmetries and complementary logical polarities and relations relative to the logically relative asymmetry of unity and duality (and the primitive primals, 1 and 2 and 3, and so forth).

So, if we could keep adding 1 to each $n > 3$ forever, an infinity of $n_c \rightarrow \infty$ will display increasing intrinsic and extrinsic complexity, symmetry, complementarity, and

divisibility, all increasing proportionally. For analyzing numbers, number theory, numeric metatheory, or \mathfrak{R}_z and **RH**, investigating and understanding the natural nonprimal numbers is critically essential.

After all, without composite non-primality, numeric primality and primal numbers would be impossible. So, nonprimal numeric logic is as essential to fundamental metamaths as the primal numbers. Ramanujan's works, among others, prove that truth. Obviously, adequate definition and understanding of nonprimal numbers is as important for optimum science as for optimal maths and metamaths.

Nöetic: Mental and virtual phenomena and concepts are nöetic, nonphysical yet actual phenomena. The principles of maths and natural metalogic are the subtlest and most potent constituents of the nöosphere. The realm of mentality, metalogic, and cognitive phenomena contains and enables all subsidiary domains of logic, concepts, and discourse.

Clearly, some mental phenomena and conceptions of maths and metamaths are less subtle and mostly less potent than elemental principles of nöetic meta-logic. From the perspective of natural logic, the nöetic, semiotic, and somatic orders of reality exist in dynamic dyadic and triadic relationship, subsets of the macrocosmic nature of being. For example, nöetic, semiotic, and somatic principles enable the potentials of the principles and properties of mental, vocal/verbal, and biophysical actualities of being. Thus, we can intuit or realize and/or see the intrinsic ultra-virtual, virtual, and extrinsic forms and orders of being, logic, and interaction.

In other words, physical embodiments, actual and virtual expressions of being are integral, interdependent, interactive aspects of universal intelligence. Hence, natural nöetic principles enable science, maths, and metamaths, enabling and verifying their existence.

Neophobia: All chronic or recurrent irrational fears are phobias. The most irrational phobia is chronic fear of the new, because each moment of being is new.

As most of us know, with the tiniest fractions of duration we can call moments, all physical things and beings constantly change. All its ever-changing things and events change the whole universe and everything in its vast yet momentary presence. Each moment, however brief, all things and events exist in a new form and way, whether we realize that or not.

Yet, scientists and mathematicians are human animals, most less than perfectly rational, at best. Therefore, most of us resist new ideas and theories that seem to threaten our conceptions of reality, normality, and acceptability.

Xenophobia: Chronic irrational fear of the alien (or the strange) usually occurs in combination with neophobia. The more different or unusual or unexpected something seems, the more alien and frightening it seems to xenophobiacs. So, the disorder involves irrational fear and loathing of the strange, the new, the unknown, and the unknowable. Xenophobia is a major hindrance, impeding and/or preventing the evolution of science, maths, society, and civilization.

MacDonaldization: The pandemic commodification of everything driven by

consumerist commodification of everything, maintains pervasive neurolinguistic programming (via normalized mass-deception AKA education and advertising). It also enforces the increasingly competitive commercialization of science and technology R&D. That led to systematic subversion or diversion and accelerating siloization of specialists. So, calling the academic mass-production infrastructure the “MacDonaldization” of education became increasingly appropriate.

Ego: Ontology and psychology, among other sciences, were side-tracked (or worse) by mass-confusion about ego, among other things. Buckminster Fuller’s insight seems most helpful for modern civilization. He saw ego as a function of the universe that enables different points of view.

That may seem too simple, but it enables detangling reality from the fog of vague notions, opinions, and shibboleths obscuring society’s psychic air. However, seemingly, most of us have no ego problems as babies. Socialization processes then induce and reinforce confusion about the difference between identity and habits of thought, perception, reaction, and social roles.

That usually leads to the huge variety of problems that plague human civilizations. Now, in Español (Spanish), the meaning of “ego” is self. Yet, as the Buddha realized, being confused about self, ego, personality, society, and the nature of reality causes more than problems. It tends to trap us in cycles of gradually accelerating spirals of fear, hope, suffering, worse confusion, increasing disappointment, and more unsatisfactory experience, emotional stagnation or worse.

The great sages of ancient India saw the same thing, normal socialization causing delusional belief in a false self-world construct. The Bible says Jesus saw normal people as spiritually dead sleep walkers, who blindly follow blind leaders into a dark, bottomless pit. Clearly, from Fuller’s perspective—ego is a function of mind, enabling awareness, individual perception, and consciousness—we can find the way out of the dark fog of confusion, into the light of understanding. Yet, the Buddha saw that the way is neither easy nor difficult.

If retraining the mind and freeing the ego was easy, the world may have been a Green heaven on Earth before the birth of Jesus. If it were too difficult, nobody could get free, and we might have self-extincted already. According to the old masters, curing ego’s addiction to confusion, delusion, and illusion just takes steady intent, real commitment, trust, and diligent persistence.

Of course, those are the requirements for great success in science, the arts, business, sports, and relationships. So, gaining progressively greater understanding of ego, mind, mentality, personality, and the other principles of being is essential to real progress. That makes a realistic definition and good understanding of what ego is essential to holontology.

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SECTION 4, APPENDIX A

Important Words and Meanings

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Note: There are ancient Greek words with no simple English translation, yet 12 are crucially relevant now and for a more livable future. Of the essential Greek words of the 4th Century BCE, acsesis, parrhesia, phronesis, and prohairesis constitute “the Bushie” Quaternity.*

1. Acesis: Repetition, *e.g.*, in Confucianism, at age 5, ancient texts are learnt by heart, and by 40 they start to reveal their wisdom. Evidently, some ancient Greeks appreciated the value of repetition as an aid to ongoing learning.

2. Akrasia: Moral incontinence, cognitive failure in this regard, re: Plato: 1) violent disposition against right reason and 2) irrational weakness (pertaining to speech). Aristotle uses it in the latter sense 87 times, *vs.* in Plato, twice. Moral incontinence is the inability to act on what one thinks is right, *e.g.*, the smoker who keeps on smoking despite knowing the potential harm.

Also, the words 'hypocrisy' and 'corruption' serve where we knowingly, habitually, act against what we know and claim is right. That relates to 'vitiare' or to morally corrupt or to debase or destroy or drastically reduce the effectiveness of something, to make it invalid.

To cause something to become defective is to vitiare it. Though not directly Greek, vitiare is nevertheless relevant, timely, and appropriate to understanding akrasia and evil.

Vitiare comes from Latin vitiare, from vitium, fault. It is related to vice (a moral failing or fault), from French. For example, promoting or supporting ecocidal corruption is the worst of all vices, for it encourages or rationalizes all other anti-bioethical evils and atrocities.

12. Arete: An ancient Greek concept for the 'spirit of virtue,' natural excellence without show or being heroic (a usually flawed archetype). Even if it cannot be taught, it can be cultivated from within, building character with appropriate ethos.

This was the basis of the Human Potential Movement. Arete shares a root with the term 'aristocrat,' meaning naturally noble. Arete is inherent to phronesis (see below), embodying integrity of the beholder and beheld, with spirit, strength & skill.

For Aristotle, *arête*/phronesis is an adult power of insight into practical matters, cultivated and developed by experience, a kind of *sophia*, inherent wisdom.

12. Ascesis: A training word, in the Bushie sense, based on the chiro/organon approach to technique, *techné* + technique and CBT (competency-based training) or as I call it RBC (repetition-based conditioning). Training here mainly means expert mentoring leading to mastery, expert self-discipline.

This is in line with the ancient concept of ascesis, mostly lost to the West for millennia, especially since the rise of industrialism. We see it in the East, in serious Yoga and Buddhist praxis. In its ultimate expression, ascesis is the repeated expression of faith, hope, love and skill, wisdom in action (see Illich 2005:228). This offers a taste of the origins of our modern sense of the *ascetic* and asceticism.

5. Khrématistiké: The ancient 'art' of acquisition. Aristotle recognized it as early as 500 BCE, seeing 'chrematistics' as inspired by love of gold and wealth. Of course, it leads to insatiable greed, corruption and worship of Mammon, the 'god' or spirit of greed.

6. Koinonia: This is another complex, fascinating ancient Greek word, without any single English equivalent. It represents a unique approach to community building and teamwork.

Koinonia means an amalgam of: 1.a) common ground; b) joint ownership, sharing, joint-ownership, gifting, living together; 2.a) common effort, mutual aid, joint decision-

making, 2.b) fellowship, companionship and shared passion. It also means 3.a) a vertical relationship (consciousness, linking spiritual, 3.b) as well as horizontal one (living together) and 3.c) material aspects of existence, plus integration of all these aspects of community, and 3.d) trust.

The ultimate meaning of koinonia is inner and outer unity in harmony, integrating inner goodness towards virtue and outer goodness with bioethical culture, society and community. Further, in this holistic understanding of community there no implied hierarchy of command and control. While there is leadership, the leader's task is to encourage, focus energy, and align interests—making koinonia the key element of any healthy civilization.

At best, marriage is a form of the koinonia of bioethical family life. Koinonia is related to the Greek *oikonomia*, prudential cultural economy, opposed by *chrematistics* (the art of acquisition or an obsessive love of money, greed). Koinonia is not passive, it is a direct active principle, not only relating to a way of being but also a way of doing.

The Latin 'communitas' counters 'immunitas' (immunity from involvement in responsible community).

12. Oikonomia: In ancient Greece, the household economy was managed mostly by the women. From that we get the concepts and modern English words 'economy' and 'economics'.

In the USA, as late as the 1960s, economics was still somewhat related to the realities and ethics of life in the home. Yet, the removal of ethics from economics led to increasing separation from realism and reality. So, unlike in ancient Greek homes, economy and economics are considered banal or dismal subjects, not the Art of living well (enjoying the benefits, conveniences and amusements of human culture).

For example, in the USA, economists think of a house as a property or an investment, not as a home for perfecting the Art of Living.

8. Parrhesia: (Bushie definition) The discourse of Truth, frank and open discussion with fellow citizens (in the Bushie context), in which the Bushie manifests his/her presentation of work, of art/craft and Truth, the actualization of creative-evolutionary ethos.

Thus, parrhesia is a psychophysical braiding or intertwining of truth+project+person, quality of consciousness realized, expressed and embodied in the masterpiece or master's thesis. Instead of being simply an arrangement of mental facts, Truth then becomes an expression of viable common sense through embodied multi-level communication (of Bushies or ecotopians). Parrhesia manifests in their individual and collective activities. Parrhesia is also frankness.

Those who use parrhesia, the parrhesiastes, say everything they have in mind: they do not hide anything, but open their hearts and minds completely to other people in discourse. The speaker gives a complete and exact account of what he/she has in mind, so the audience may comprehend exactly what the speaker thinks is true or real. Parrhesiastes also make it clearly obvious that what they say is their own opinion.

They do that by avoiding any kind of rhetorical strategy which would veil the truth in mind. Instead, parrhesiastes use the most direct words and forms of expression available. Parrhesiastes act on other people's minds by showing them as directly as possible what they believe is true.

Also see Foucault's work, below.

9. Poietal knowledge: Producing, forming, shaping and making, and therefore designing, *i.e.*, artificing, are all related to a separate concept of auto-poiesis, self-regulation and self-creation. The Greek verb poieo ("I make or create"), gave rise to three words: poietis (the one who creates – inventor/innovator/bush mechanic), poiesis (the act of creation), and poiema (the thing created).

From those terms we got three English words: poet (the creator), poesy (the creation) and poem (the created). A poet is therefore one who creates, and poetry is what the poet creates. The underlying concept of the poet as maker or creator is not uncommon.

For example, in Anglo-Saxon a poet is a scop (shaper or maker) and in Scots makar. So, in ancient Anglo-Saxon, an artificer is a *scoper* and in Gaelic a *makar*.

10. Praxis: Aristotle (circa 500 BC) identified praxis as one of four types of knowledge: a) Theoria, academic knowledge, intellectual thought, axiomatic theory and conjecture, b) Poietal knowledge, productive forming and making and therefore designing, artificing, creating something in the psychophysical realm of being, *e.g.*, a poem, work of art, building, prototyping, designing (and interpreting), etc. and application of cumulative theoria.

Yet, more like poietis, the bush mechanic shaping or poiesising (creating) the exemplar project, integrates poiema, linked to techne (experienced based practice). Praxis is doing, action, and learning from it, not directly associated with production. It generates poesic knowledge and imaginal, creative vision.

Some authors included another form of knowledge as a result of praxis: gnosis, direct cognition of reality or truth.

11. Prohairesis: Choosing ahead wisely (Bushie extended to foresight + acting wisely in creating the future); prohairesis is commitment to a course of action based on intention that expresses and/or embodies the character (ethos) and bioethical stature of a person enmeshed in and expressed through the unfolding future.

In his Nicomachean Ethics (Bk 3 chap 2-3) Aristotle considers prohairesis the ability and virtue of our moral character, shown in our capacity for 'ethical choice and action' stretching out into the future. Responding, taking or choosing the envisioned future in advance a) as a guide and/or b) as a self-willed, intended destination. That integrates intention and extension, *i.e.*, the intended destination/outcome and extistential capabilities necessary to achieve this (see *Phronesis*).

So, in Aristotle's view, a rational agent's wish differs from appetite in so far as it is guided by deliberation based upon one's conception of one's good. That conception evolves and extends beyond our present inclinations both at a particular time and over time. Rational agents are aware of themselves as extending into past and future. Deliberation then is guided with reference to the broader aspects of one's aims and nature. That produces results per the rational choice Aristotle calls 'decision' (prohairesis; Nicomachean Ethics III 3).

12. Phronesis: Wise, ethical, practical action, practical wisdom and wise use: GREAT SPIRIT + STRENGTH + SKILL is the nature and way of phronesis. For Aristotle,

phronesis is 'an adult power of insight into practical matters, cultivated and developed by experience, a kind of 'sophia' (inherent wisdom, appropriate knowledge & genius).

For example, quality is based on inherent qualities of the beholder, not only of the beheld. It is the root of being oneself, self-fulfilling self-reliance, optimum wellness, of thriving, fortitude and personal excellence. Phronesis is also the root of justice, of cultural wellness, of a truly sane, equitable commonwealth.

Overview:

Solutions to many of the problems in the world today require those 10 words for effective problem analysis. They no longer exist in common use. The 3 essential terms—parrhesia, phronesis and prohaireisis—in their Greek sense of being in the Truth, relate to realistic discourse, ethical deliberation and appropriate action).

The full importance and meaning no longer exist in the dominant cultural paradigm ruling academia, political policy and critical decision-making.

Yet, they should and must regain their original importance, if we want a future worth sustaining. Living in and with the Truth (of reality and bioethical integrity) is a necessary ingredient of cultural wellness, social sanity and sustainable prosperity. So, we hope you will share and use the great words, definitions and principles of Truth as often as possible.

Foucault on Parrhesia & Truth:

Authors' request: Please read at least the last 2 paragraphs. Thanks ~

I [Foucault] should note that I never found any texts in ancient Greek culture where the parrhesiastes seems to have any doubts about his own possession of the truth. And indeed, that is the difference between the Cartesian problem and the Parrhesiastic attitude. For before Descartes obtains indubitable clear and distinct evidence, he is not certain that what he believes is, in fact, true. In the Greek conception of parrhesia, however, there does not seem to be a problem about the acquisition of the truth since such truth-having is guaranteed by the possession of certain moral qualities: when someone has certain moral qualities, then that is the proof that he has access to truth, and vice-versa.

The 'parrhesiastic game' presupposes that the parrhesiastes is someone who has the moral qualities which are required, first, to know the truth, and secondly, to convey such truth to others. If there is a kind of 'proof' of the sincerity of the parrhesiastes, it is his courage. The fact that a speaker says something dangerous—different from what the majority believes—is a strong indication that he is a parrhesiastes.

If we raise the question of how we can know whether someone is a truth-teller, we raise two questions. First, how is it that we can know whether some particular individual is a truth-teller; and secondly, how is it that the alleged parrhesiastes can be certain that what he believes is, in fact, truth.

The first question, recognizing someone as a parrhesiastes, was a very important one in Greco-Roman society and, as we shall see, was explicitly raised and discussed by Plutarch, Galen, and others. The second skeptical question, however, is a particularly modern one which, I believe, is foreign to the Greeks.

Parrhesia and Danger:

Someone is said to use parrhesia and merits consideration as a parrhesiastes only if there is a risk or danger for him or her in telling the truth. For instance, from the ancient Greek perspective, a grammar teacher may tell the truth to the children that he teaches, and indeed may have no doubt that what he teaches is true. But in spite of this coincidence between belief and truth, he is not a parrhesiastes.

However, when a philosopher addresses himself...to a tyrant, and tells him that his tyranny is disturbing and unpleasant because tyranny is incompatible with justice, then the philosopher speaks the truth, believes he is speaking the truth, and, more than that, also takes a risk (since the tyrant may become angry, may punish him, may exile him, may kill him). And that was exactly Plato's situation with Dionysius in Syracuse—concerning which there are very interesting references in Plato's Seventh Letter—and also in *The Life of Dion* by Plutarch.

...So you see, the parrhesiastes is someone who takes a risk. Of course, this risk is not always a risk of life. When, for example, you see a friend doing something wrong and you risk incurring his anger by telling him he is wrong, you are acting as a parrhesiastes. In such a case, you do not risk your life, but you may hurt him by your remarks, and your friendship may consequently suffer for it.

If, in a political debate, an orator risks losing his popularity because his opinions are contrary to the majority's opinion, or his opinions may usher in a political scandal, he uses parrhesia. Parrhesia, then, is linked to courage in the face of danger: it demands the courage to speak the truth in spite of some danger. And in its extreme form, telling the truth takes place in the 'game' of life or death.

It is because the parrhesiastes must take a risk in speaking the truth that the king or tyrant generally cannot use parrhesia; for he risks nothing. When you accept the parrhesiastic game in which your own life is exposed, you are taking up a specific relationship to yourself: you risk death to tell the truth instead of reposing in the security of a life where the truth goes unspoken.

Of course, the threat of death comes from the Other, and thereby requires a relationship to himself: he prefers himself as a truth-teller rather than as a living being who is false to himself. Politically we see a trend towards a firm resolve to do away with any law, constitutional or not, that stands in the way of shifting designs inspired by greed and vindictiveness rather than by the drive for power or any coherent political program. In this context, the decisive aspect of this lying on principle is that it can work only through terror, that is, through the invasion of the political process by sheer criminality.

Under those circumstances, it is entirely true that, as Melman states, *inefficiency has been elevated into a national purpose, and what has come home to roost in this particular case (Nixon and Watergate) is the hectic and unfortunately highly successful policy of 'solving' very real problems by clever gimmicks which are only successful enough to make the problems disappear temporarily.*

Note: As we see in those last 2 paragraphs, a cure for the cultural illness of this co-called post-Truth age of ShowBiz has been around for more than 3,000 years. It also proves the validity of the diagnosis given by Foucault, Melman et al decades ago, prophetically predicting today's systemic corruption and national insanity.

It is insane because psychopathic insanity prevents concern and action ensuring optimum wellness, safety, life, liberty and effective participation in healthy culture, community and family. Mass-psychosis also fosters and supports ecocidal kleptocracy, rule by psychopathic thieves and corporate pirates.

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SECTION 5, APPENDIX B

The Linguistic Problem

Introduction

A prime number is one measured by a unit alone. – Euclid

Mathematicians have tried in vain to this day to discover some order in the sequence of prime numbers, and we have reason to believe that it is a mystery into which the human mind will never penetrate. – Euler

As far as the laws of mathematics refer to reality, they are not certain, as far as they are certain, they do not refer to reality. – Einstein

Those opening quotes—of Euclid, Euler, and Einstein—are potent examples of the neurolinguistic power of trend-setting genius and normal confusion. This little story shows why that matters, and how and why science and society slid into the global crisis now threatening civilization and all life on Earth.

What’s in a name? Names, words, and ideas have real power. So, how we all use them or misuse them matters.

For example, confusing mechanics with statistical maths, was much worse than a minor problem. Statistics, probability theory, and models of hypothetical models of potentially probable approximations of mathematical objects, forms of energy, chaos, and a theoretical universe are probabilities, not mechanical objects.

Understanding, repairing, and upgrading the paradigms of science and maths requires nothing less than a new telling of the story of their development, a realistic history. Success requires explaining and critiquing our Western phase of world history. Critiquing the West’s stunted, mislabeled “Age of Reason” (AKA The Enlightenment) also required brief critiques of two books of great (if imperfect) wisdom and influence. Both dealt with knowledge and paradigms (mental models), and the power of ideas, assumptions, beliefs, and social norms. However, as shown below, both books failed to fully address and explain the powers and deficiencies of language.

More recent works have gone further, towards a definitive diagnosis, yet not far enough for a cure of the schizoid psychosocial illness maintaining the problem. For example, Dr. Steven Goldman’s lectures and book, on *Science Wars* (2021, Oxford University Press) provides an extensively detailed history of nearly the whole of the rise, decline, and ongoing fall of the semantics and intellectual integrity of modern science. Goldman also diagnoses most of the key actors and causal factors. Jim Baggott’s new book, *Farewell to Reality: How Modern Physics Betrayed the Search for Scientific Truth*, (2021, Pegasus Books) offers a scathing indictment of pandemic illogic and intellectual decay.

Among other critical works, *Science Fiction: How Fraud, Bias, Negligence, and Hype Undermine the Search for Truth* (by Stuart James Ritchie, 2020, MacMillan-Metropolitan Books), diagnoses the problem as pandemic anti-ethical, psychosocial malignancy. However, being an effective psychologist and world-class analyst of normalized social pathologies, Ritchie recommends a prescription for rehabbing the domain and practice of science.

Yet, as Niels Bohr, Thomas Kuhn, and other concerned experts realized (during the last 100 years or so), taking the cure is optional; and the patient, suffering chronic denial, refuses the necessary treatment. *Science for Sale*, by ? (20??, publ.), covers most of the sociopolitical and socioeconomic factors that maintain, aggravate, and accelerate the corruption and decline of pure science and its sociocultural domain of discourse—its determining, limiting context of knowledge, communication, and thinkability.

So, after nearly 3 millennia, cultural illness, commercialism, chronic confusion, and normalized schisms plague and subvert science, maths, and society. For the sake of a cure as soon as possible, this must be a summary of the problem. The aim is absolute proof that whoever wants to do mathematics (maths), economics, or mathematical physics should have a good basic understanding of the foundation of maths, its paradigm, its metatheory (enabling principles, concepts, semiotic & numeric logic, etc.), AKA metamathematics (metamaths). However, the fact that metamaths, maths, and logic are not generally well understood is proven by students, teachers, mathematicians, physicists, and economists, daily. Thus, the label “quantum mechanics” (QM), stands as a prime example of excess adoration of sciencey quantification of probabilistic statistical studies and interpretations of expected explosion aftermaths.

Through force of habit and subliminal corruption, mass-confusion clearly perpetuates a post-truth era of normalized deception. Therefore, by not removing the root cause, the many good books on the problem (and potential relief of symptoms) could not foster a sustainable rehabilitation of science and civilization.

Deconstruction & Analysis

Now, despite all the above, integrating macro-ontology, its theory, and the holonomic metatheory of enabling principles (of being and its nature), exposes the root cause of our problem. It proves that materialistic QM ‘cosmology’ (and QM rhetoric) diverted physics, astronomy, and education, and how. That enables ongoing dethroning of scientific fictions, shibboleths, normalized absurdity, and deceptive pseudo-theory. For instance, the theory and meta-theory of nature’s enabling principles prove that a Big Bang of something from nothing nowhere is impossible.

That disproves QM cosmology and much of QM particle theory. So, now we can clearly see that QM theorists mystified, confused, and deceived most of the rest of us for nearly a century. Thus, such claims can seem too colossal, too outrageous to be true. Yet, this essay confirms the proof, with extensive evidence, verified by truly great experts (of real genius) in the relevant fields.

First, for anyone unfamiliar with the terms presented in this paper, it could seem that physics and my theory and metatheory of atemporal primacy, mathematics (maths), economics, ethics, and linguistics have little or nothing to do with each other. However, read on and you may see how and why they all made this work both possible and necessary.

Briefly, my reasons for attempting this seemingly colossal project also motivated nearly 55 years of my quest to end my confusion and its consequences. Eventually, I realized that success was and is possible. We can master the science of being (ontology) and the art of living (Oikonomia, Eng., from ancient Greek). I then saw that most of our modern problems were caused and maintained mainly by mass-confusion, aggravated by systematic corruption. It promotes more normalized corruption and ignorance of the nature and subliminal power of linguistics and psychosocial programming. That enables more confusion, more corruption, and more mass-deception.

So, though I will always respect pioneers of great genius, I will always dislike their potential for increasing confusion. For, when opinions of super-intelligent experts support normalized deception and confusion, the quality of education decreases as mass-regression increases. Consider these examples:

Both were brilliant pioneers but, to Leonhard Euler, Euclid's definition of "prime numbers" must have seemed confusingly obscure or deficient. Believing that numbers can be measured and that numeric units exist in isolation does require confusion. Still, Euclid developed the first elegantly logical proof that there could be an infinite quantity of primal numbers, AKA primes (if anyone could keep adding forever).

Of course, Euclid's ancient Greek words probably meant much more than ours. For whatever reasons, Euler was so baffled by numbers that he supported making 2 the first primal number (demoting 1, the primary numeric symbol of primality, priority, and primacy). Euler also approved of the technical re-definition of a "prime number" (giving it a less logically realistic meaning). So, now, almost all mathematicians and logicians are at least as mystified by and confused about primality (and the other enabling principles of numeric logic) as Euler, Gauss, and Riemann. They just take the term ("prime") for granted, as if a label for an atheistic mystery or accident of maths is acceptable. So, they ignore their illogic and fail to see the distribution of primal numbers and sequences as a result of the non-random orderliness of numeric logic and all the other ('even' & 'odd') numbers.

In the long run, Einstein's genius for humor may seem his most potent talent, but he was clearly confused about maths, time, space, gravity, and reality. Of course, Einstein understood the problem well enough to make his clever joke about it. Yet, even using the word "laws" (even with a wink) fails to eliminate normal confusion about both reality and maths. However, it proves and exposes the nature of our linguistic problem and the severity of its impact on science and society.

Indeed—other than certain economists—it would be hard to imagine someone more influential than Einstein. Still, most of us remain unaware of all his achievements and failures. After all he was a man of his times, stuck with words and ideas maintained by the mainstream paradigm (the post-medieval context of thinkability).

Then, as now, for almost all civilized folk, money and economics seemed to make the world go round. Yet, money and economics could never exist without enabling logic and mathematics; and, now, modern economies and currencies depend on and are secured by 'prime numbers' and mathematical logic.

Oddly, though mainstream economics and mathematics are inseparable, the combination helps perpetuate illusion and deception. Politics and our linguistic problem cause and perpetuate that unethical dilemma. However, pure science and mathematics may be hyper-exotic, but not purely corrupt. Despite that logical truth, history proved

corruption, sciencey rhetoric, and over-sophisticated scientification (of unscientific professions) enabled removal of ethics from mainstream economics.

In other words, rationalized abuse and misuse of statistics and maths—for the sake of profit, status, politics, and mass-confusion—served anti-ethical capitalism very well. So, politics, all of society, most scientists, and [what we call] science suffer from confusion about money and anti-ethical economics.

Therefore, the cure includes reviving “oikonomia” — the communal art of living well — to rehabilitate economics. Only adopting a linguistic paradigm that supports bio-ethical meta-economics and holonomic econometrics will enable a cure. Only integrating economics and bio-ethics can end civilization’s ecocidal new normal.

Fully understanding the historic cultural dimensions of the problem can help us resolve the neurolinguistic root of our problem.

Mechanics vs. God

Descartes and Newton midwived the mechanical cosmology and much of the language of modern science, but religious beliefs clouded the issue. That was caused by the inherent biases of language, the antique paradigm of post-medieval civilization, and the ongoing confusion they caused. To be fair though, Galileo, and the Greeks before him, got the modern world’s mechanistic ball rolling.

The famous “Antekithera device”—a mechanical astronomical calculator—dates mechanistic thinking back to the time of ancient Greece (etc.). By the mid-18th century, one of the greatest multi-specialists in the history of science, C. F. Gauss, lamented all the confusing terminology of maths. Now, it is reasonable to believe that he realized the potential for derailing future maths and the other domains of science. So, he suggested more logical, purely descriptive terms. His colleagues and successors had little or no interest in solving that problem, and neither did Gauss.

So, early in its development, economics was infected by scientism’s amorality, increasingly unrealistic theory, subversive rhetoric, and the mass-urge to counteract the power of the “Holy Roman Empire” (with new, atheistic dogmas). The infection soon spread to other fields of endeavor and enterprise.

Why? As far as “laws” of mathematics go, Einstein was partially right. His final knowledge of “reality” is unknowable; but mathematics has principles, functions, and rules, not laws. Physics is not God rolling dice, but reality and maths depend on much more than Einstein could know. Clearly though, he was not the only genius limited by an incomplete understanding of the paradigm and neurolinguistics of his time.

Like us, Einstein talked about his own beliefs (etc.), his own version of subjective reality and unreality. He was unaware of a way to understand and write or talk about the pre-Earthly reality of being. So, as he watched, QM maths, physics, economics, and politics went ever further astray. Seeing how and why is as important as understanding how to avoid premature extinction.

For example, a fortune cookie truism says “the code is mightier than the word.” In fact, the world and technopoly are so computerized now—regardless of ethics, sanity, etc.—code and coders run the world, for better and worse.

However, maths is a language, a vast domain of knowledge, a science, a complex of technical disciplines, and the practical endeavors from which it evolved. So, in this technified post-Trump era of commercial civilization, understanding the nature of maths

matters. Additionally, the unbreakable law of interdependent interaction, AKA karma (the nature of action & activity) is universal. Ignore it and, sooner or later, the effects of causes and not knowing what you don't know will hurt you.

Of course, most busy parents and normal members of civilized society may not want to make metamathematics (metamaths) a long-term study. Still, understanding the basics is easier than mastering trigonometry or algebra. The nature of maths, metamaths, is its enabling principles, basic properties, and potentials, defined and explained by its metatheory. Its logic infrastructure is enabled by nature's metalogical principles. That may seem inscrutable or overly challenging but, understanding the nature of something is possible without knowing all its details.

Actually, understanding its nature demystifies maths. Then we can deconstruct and critique the logic, semiotics, and rhetoric of economics and mainstream SM physics (and of QM cosmology). It also enables seeing the illogic maintaining and limiting our anti-ethical socioeconomic system and its ecocidal Winners Take All paradigm. We can then rehab the incomplete development, deficiencies, defects, and notions of post-Einsteinian physics, QM cosmology, and post-Truth economics. Otherwise, most academics, scientists, mathematicians, technicians, politicians, and economists (and their employers) will keep misleading and disinforming us. If that goes on, the end of dysfunctional technopoly may come sooner than otherwise possible.

In fact, like dense fog, modern status quo economics and its dynamic conservatism have normalized the pandemic of commercial mass-deception, for mass-confusion. That pandemic normalizes the sanctification and mystification of science, maths, and technology. As shown here, the abuse of language and knowledge making maths so difficult made modern economics too unrealistic to be really good for anyone. The process of gradual mass-confusion (mass-deception & corruption) was as effective as baffling for all us.

Now, the losers fail to realize that the US Federal Reserve system always keeps the richest monopolists getting richer faster, easier, automatically. Inevitably though, being vulnerable mortals, the 'hyper-rich' will suffer the results they caused, possibly by 2028. This most modern cycle (the "business cycle" AKA Casino Capitalism) may be the last, taking down all players, potentially all species. Remember, by design, the Fed failed to prevent catastrophies, like the Crash of 1929 and the global Great Depression it was supposed to prevent, forever.

Sadly, the losers (about 99.9% of us), now thoroughly bamboozled, fail to have the Fed abolished. So, the percentage of civilized folk getting poorer faster keeps increasing faster, by design. When a critical mass of disillusioned participants have had enough of the game, their exit will end it, one way or another.

Already, thanks to the Internet and viral mass-sharing of truths and realities, billions of losers are waking up and opting out of central bankers' debt-currencies. The Fed's USD\$ are as vulnerable as all other currencies based on bad theories and fake concepts. In fact, per IMF estimates of the Fed's paper currency in circulation globally, US\$100 bills may total more than ±14 billion (i.e., ±\$1.4 trillion USD). Yet, by 2018, the Fed's estimate was ±80% of nearly 12 billion real \$100 bills were outside the USA. Oddly, the Fed says all counterfeit US\$ bills in the USA ranges from 1 in 10,000 to 1 in 4,000. That difference reveals severely fuzzy certainty of the total, just in the USA. Of course, it avoids mentioning that—outside US jurisdiction—perfect fakes, of both older and new

“supernote” \$100USD bills, may out-number Fed Benjamins by much more than 6 to 1.

Obviously, the Fed and US Treasury have no interest in reporting even smaller numbers. Even an hour of online searching turns up no up-to-date articles or official discussion of how many fake US\$ trillions may be printed and used by the huge crime cartels, state-sponsored terrorists, and failed/rogue states (to avoid money laundering hassles).

Of course, the biggest Black-marketeers are happy with any currency they can use as easily as US\$100 bills. So, it doesn’t take a degree in economics or maths to figure out the real scale of the Fed’s vulnerability. Clearly, doing even rule-of-thumb maths enables realization of the implications, likely outcomes, and sustainable alternatives.

However, modern society keeps making conspiracy theories of history obsolete. Consider the *Wisdom of Leopold Kohr*,^[1] a lecture by Ivan Illich.(III 1994) He summarized how regressive systemization, scientification, commercialization, commodification, and devolution ensure the devaluation of reality, humanity, and community.

Kohr and Illich, among others, saw direct connections between Euler’s attempt to systematize music with mathematics and the drive to ‘normalize’ everything. Also, standardization of musical tunings, metrics, and education for the sake of technocracy, supported the ever-growing sociopolitical power of scientists, technologists, academics, military-industrial monopolists, and the anti-ethical economists who rationalized it. That rationalized the increasingly pervasive acceptance of anti-ethical economics as a ‘hard’ science, validated by mathematics and modernism.

Kohr also saw the multi-century devolutionary process accelerating the decline and gradual loss of both ‘common sense’ and humane ethos. Illich’s lecture on Kohr’s understanding is brief, but deep, broad and detailed. The following excerpts serve well enough here:

The word “common,” which began with a robust sense (something “belonging to the community,” *Oxford English Dictionary*) extending to each person (this was the “comyn voys” of every man, - Chaucer)...came to signify a mean or vulgar person.

Not only were seeing and hearing transformed, not only the senses themselves, but also the character of desire—with the good disappearing, to be replaced by value. In ethics, value widely displaced the good. It’s true that “value” is an old word; it stood near “dignity” in meaning, pointed out what was precious, indeed magnificent, and early on indicated the selling price of an object.

Since the beginning of the eighteenth century, “value” has had these uses and has denoted what was always desirable, useful, even what was due; it then entered discourse in place of the good. By the time of my youth, it simply stood on the positive side of zero. Today, however, one needs a qualifier—values can be either positive or negative. To resolve this convertibility, to make it determinate, there is no stable criterion. With values, anything can be transposed into anything else, just as in music, with equally tempered tones, any melody can be transposed from one key into another.

Proportionality being lost, neither harmony nor disharmony retains any roots in an ethos. The good, in the sense of Kohr’s certain appropriateness, becomes trite, if not a historical relic. It then becomes possible to speak about the triviality of evil.

In ethics, values are as opposed to an immanent, concrete proportion as are the sounds of Helmholtz. Like them, values run counter to *tonos*, the specific tension of a mutuality or reciprocity. As timbre separated from tone, so that one could play a violin’s part on the piano, so an ethics of value—with its misplaced concreteness—allowed one to speak of human problems. If people had problems, it no longer made sense to speak of human choice. People could demand solutions. To find them, values could be shifted

and prioritized, manipulated and maximized.

Not only the language but the very modes of thinking found in mathematics could norm the realm of human relationships. Algorithms “purified” value by filtering out appropriateness, thereby taking the good out of ethics. – Ivan Illich
centerforneweconomics.org/publications/the-wisdom-of-leopold-kohr/

Naturally, ethics without goodness is as impossible as goodness without ethics, but economists still ignore that fact. Rehabilitated value and primality are explained in Appendix A. Yet, a brief recap may help recall the original sense of prime values.

Value and primality are relative terms but, essentially, they relate to elemental natural principles. Value refers to natural benefit, whatever enhances or sustains quality of life and its enjoyment. Evidently, from our beginnings, we cherished the proportional relativity and appropriateness that best served the specific relational harmony of daily lives, in the habitats that fostered and sustained our ancestors. What best fostered our well-being and greatest joy was considered magnificently precious, even sacred.

So, what we think of as prime is of primary significance or importance, relative to everything else of secondary quality (or less than prime). The prime value was once

- life itself
- the cosmos
- its nature
- Earth’s amazing habitats

All that supported our enjoyment of life. That preceded our artificial, systemic (symbolic) values, and arbitrary, abstract (purely conceptual) valuation. Our symbolic constructs exist only within the context of our beliefs, definitions, assumptions, illusions, doctrines, and dogmas.

Clearly, the curse of Babel is about much more than too many different languages. Unfortunately, languages and the technical jargons of specialists are built on and maintain not only logic, but also the illogic, prejudice and embedded social agendas that normally remain unknown or ignored. So, it remains normally ignored or unconsidered or discounted, and exploited. That makes the divisive mechanisms of our cultural languages almost invisible and, thus, virtually impossible to eliminate or change.

Naturally, like everyone else, mathematicians and economists are not immune to the limiting and deceptive effects of their languages. That begat the illogical basis of anti-ethical economics and anti-theistic scientism.

Western Enlightenment

Sabine Maasden and Peter Weingart provided an encyclopedic exposition of the mechanics of the problem in *Metaphors and the Dynamics of Knowledge*, (Maa-Wei, 2000). Using systems theory, they analyzed knowledge dynamics and studied the functioning and influences of ideas and popular assumptions (in society). They analyzed dominant trends characterized by

- anti-theistic sanctification of Darwinian presumptions
- bureaucratic institutionalization of Kuhnian metaphors
- the transformation of “chaos” into a Show Biz buzzword

Valid chaos theory notwithstanding, lacking awareness and understanding of the nature of the problem, the Yellow Brick Road of commercialized ‘good’ intention led to

the freeway to Hell. For example, in Chapter 3, *Struggle for Existence* (on “selection, retention, and extinction of a metaphor”) Maasden & Weingart expose the vulnerable “[f]unctions and dysfunctions of metaphors in science” and show how the process proceeds. Reviewing even a few of the most revealing realizations, enables deeper, broader understanding. Consider the issues raised and implied in the following excerpts.

...the use of metaphor can be defined as one of those societal procedures by which 'in every society the production of discourse is controlled, selected, organized and channeled' (see Foucault 1974: 7).^[2] This is supported by Max Black, who sees the creative potential of metaphor in the fact that it 'selects, emphasizes, suppresses and organizes' features of reality (Black 1962: 44).^[2]

In the context of Foucault's discourse analysis, metaphor can be described as a principle of arrangement and diffusion of knowledge. The socio-historical privilege attached to some metaphors is not just the result of some intellectual game, but of a competition of existing and institutionally established discourses, which select for or against the import of particular *foreign* constructs. For a metaphor, that is, the construct of an *extraneous* discourse bears the stamp of the latter, and, in relation to the importing discourse, poses the 'risk' of 'swallowing' a whole cluster of epistemic as well as political and moral implications (e.g., Nancy L. Stepan 1986).^[2]

More is involved, though, than 'only' symbolic processes. Discourses changed by metaphor reorganize reality. In this way, within the order of discourse, metaphors are effective elements in the interplay of power/knowledge (see Foucault 1977: 120).^[2] (Maa-Wei, 2000: p. 21)

Unfortunately, pristine academic styling gives *Metaphors and the Dynamics of Knowledge* impressive scientific credibility, yet also serves to perpetuate the problem as much as it fosters clarity and resolution. For optimal odds of avoid premature extinction, civilization needs emergency response for a mass-paradigm upgrade.

Disembodied conceptual discourses, metaphors, and their contexts do nothing on their own. Our actions of human body, speech, and mind change and reorganize reality. Maasden & Weingart wisely targeted the historic devolution of Kuhn's insights and notions about devolution and revolution in scientific models of reality (paradigms). That and abuse of chaos theory prove the common misuse of metaphors.

Yet, Maasden and Weingart only mention 'conventional wisdom' in alluding to an alleged lack of Social Darwinism in proto-Nazi Germany, without voicing the difference between wisdom and knowledge, or between truth and rhetoric. So, by default, their respectable, academic rhetoric supports chronic institutionalization of intellectual elitism (if not weaponization). Still, they help us recognize and understand the nature and potency of metaphor.

Clearly, understanding the devolution of conventional wisdom, as a relentless cause and effect of stealthy social control mechanisms (embedded in the commercialized context of academic and nonacademic social groups) is necessary for intellectual honesty and optimum responsibility. While not throwing baby out with the bathwater, the following paragraph reveals real wisdom:

In one of the most ambitious studies in recent times, which seeks to identify the extrinsic influences on the reception of noncausal quantum physics in the 'German cultural sphere', Paul Forman explicitly objects to 'vague' and 'ambivalent' attributions and insists on a sociological causal analysis. Its starting point is the description of the 'intellectual milieu', in which German physicists worked and in which quantum mechanics was developed (Forman 1971: 1).^[2]

Forman characterizes the climate of this milieu, that is, the post-First World War

period, as *antagonistic toward analytic rationality*, in general, and toward the *exact sciences* and their technological applications, in particular. The *seeming paradox* that this climate, which is most unfavourable to physics and mathematics, should have produced the most creative scientific achievements in the history of these disciplines, is solved via the question about the type of reaction on the part of the scientists.

They *endeavour* to bring *the image* of their disciplines into *harmony* with the current *values* of society. This endeavour entails a change in *its values and in the ideology* of their science, ultimately also affecting the latter's *foundations*. (Maa-Wei 2000: p. 12)

The italics were added to emphasize the ironic, normally ignored conservatism maintaining the dominant sociocultural paradigm of technopoly. Maasden & Weingart maintained respectability required in the top tier academic social system's power structure. That may reveal deficient realization of differences between a society's values and dysvalues.

Yet, either way, that proves **GIT** (Gödel's incompleteness theorem), and **TUT** (Tarski's undefinability theorem). **GIT**, **TUT**, and their proofs, prove the impossibility of fully understanding or transcending an axiomatic system of theory from within its own conceptual constraints. However, as shown in this paper, viable metatheory (in accord with actualities of nature and/or valid metalogical principles) are exceptions to that truth (re: **GIT** & **TUT**). As if hidden in plain sight, another irony eludes anyone unfamiliar with the real history of science: illogic (nonanalytic irrationality)—fueled by unbridled creativity and undiagnosed narcissistic egomania—spawned particle physics, QM, and fantastic ideas of speculative cosmology.

Thus, they now include only interpretations of data and new observations that fit current 'standard model' (SM) theory and popular imaginings. So, thinking and talking as if a current state of SM physics theory is the ultimate, perfectly well-established, unquestionable 'theory of everything' now subverts, retards, and obstructs science and common perceptions of it. The tragedy is explained below:

Jonathan Harwood directly addresses some of these problems. He takes 'styles' as indicators that thoughts are subject to certain patterns. His distinction between 'comprehensives' and 'pragmatists' among the German geneticists is a very general one, as he himself admits.

As one reason for how such types of style could develop, Harwood proposes *the change in values* which, in the course of the modernizing process, occurred when the '*mandarins*' of the German university (*system*), who had embraced the ideal of *humanistic* education, were replaced by the new social stratum *of the sons of merchants and industrialists*. They stood for *the type* of the discipline-oriented specialist.

These differing styles of thought had a *selective impact on scientific theories*: depending on their *political* outlook, 'comprehensives' and 'pragmatists' took up opposing positions. (Maa-Wei 2000, p. 13)

Again, the italics were added to emphasize the subliminal distortions of common knowledge. The *mandarins* referred to were the "old guard" of the previous cultural paradigm mentioned by Niels Bohr, He saw them preventing scientific revolution until the last of them are buried. Their disastrous definition of *humanistic* education and its effects reveals another tragic irony: Their system created the younger monsters who replaced them.

History proved that systems of mass-education designed to produce obedient, self-enervating servants of a military-industrial socioeconomic oligarchy serve corporate fascism, not humanism. So, to their credit, Maasden & Weingart critiqued the devolution

of post-modernism and its pervasive subversion of Kuhn's ideas and keywords. Still, if conventional study of metaphor and knowledge dynamics becomes as influential (and subversive) as Kuhn's unfinished project, the aftermath of military-industrial civilization could get much worse before it gets any better.

Yet, as James Redfield reported in his nonfiction book *The Celestine Vision*, Kuhn's exposure of the defensive mechanisms perpetuating scientific social elites, their hidden agendas and obsolete paradigms was truly revolutionary. Kuhn fostered a more rapid changing of the guard, but the new guards of the new status quo were and are normally vulnerable. In-group devolution favors protecting positions, salaries, benefits, pensions, status, grant funding, social power, and institutional continuity, not quality of life, not even organizational success.

Redfield, Maasden, and Weingart also confirm related results of Donald Schon's *Beyond the Stable State*. (1973) Schon brilliantly integrated the ways and means of social theory, systems theory, and learning systems theory. He realized that any kind of social groups, of any size or scale (at least in complex mass-societies), tend to devolve into a self-defending special interest group.

So, despite the original mission and purpose of a group, its main mission becomes self-perpetuation *as is*. Schon saw that involving systemic polarization. Sorting the membership of a group—into a power elite, the leaders, and less responsible followers—maintains the status quo by default. Schon also realized that a group's power structure develops a virtual mind of its own. It maintains the status quo and the group's PC culture with stated and unstated rules, dynamic conservatism. Of course, that tends to cause devolution to the lowest common denominator and increasing dysfunctionality.

Hence, group neurosis is normally worse than the sum of members' individual neuroses, fears, vices, and weaknesses. It then relies on its dynamic conservatism to prevent remedial change and enforce compliant conformity. The group's defensive mechanisms can include deflection, diversion, denial, co-option and, if necessary, more drastic measures. Schon also saw repetitive, large-scale patterns and cycles of decline (toward disastrous social collapse), followed by what seem like sudden turn-arounds. He realized that, when a social group's dysfunctionality grows too severe, the support for status quo conduct starts crumbling. More members then jump ship and/or aggravate the decline.

Inevitably, the consequences and conditions of mass-dysfunctionality become intolerable, even for the most heavily invested power brokers. Schon identified three social dynamics that often make social dysfunctionality unavoidable. He realized that total change can be caused by any change in (a society's)

- 1 - social structure (rules, etc.) or
- 2 - 'theory' (its paradigm, beliefs, values, etc.), or
- 3 - technology

The more radical and rapid the change of one or more of the 3 basics, the more radically and rapidly the social group changes. That explains the more radical attempts to prevent or subvert radical change. Naturally, that accelerates and aggravates the dysfunction, devolution, and consequences.

So, those realizations (and Kohr's wisdom), seemingly ignored by technopoly's dominant power brokers, prove their normative self-delusion. Thus, by default, popular

scientism, exotic maths, and systemic corruption support general acceptance of what can be called the ecocidal economics of mass-insanity. They mystify and sanctify quantitative metrics, materialistic theory, and fantastic speculation about what lies beyond what can be technically detected, directly studied, and known.

As the atheistic mystification of science subverts common sense, it supports delusional commodification and devaluation of life and nature. Whether the process is intentional or not, consciously deliberate or subconsciously instinctive is irrelevant. The effects and aftermath continue as long as the causes continue.

Famous Giants vs. Clarity

Eliminating systematic confusion is clearly essential for progress. Editing and upgrading civilization's paradigm is required. Yet, recall that, unlike intrinsic principles and presence, theories are not universal realities.

So, the deficient conceptual context of 17th and 18th century Christian theology maintained the dualistic determinism of both René Descartes and Isaac Newton. That led directly to anti-theological, anti-analytic, anti-rational backlash, and to technocracy. The rise of modern maths, QM physics, anti-theistic cosmology, and the mythification of materialistic atomism enabled a covert neoPtolemaic neoPlatonism. The current SM is the aftermath, another wildly extreme swing of the pendulum.

The new in-group uses its status quo to make the previous in-group and its status quo obsolete. So, by today's SM standard, Descartes and Newton were like antique religious fanatics.

Descartes is mostly unknown or forgotten now. Also, despite inventing calculus (independently) Leibnitz is mostly forgotten. Now, Newton's obsessive study of notions, potions, and formulas of medieval alchemy and his antique religious beliefs is mostly unknown. However, like many well-known modern scientists, Newton had no idea what he was missing. He was a prisoner of his culture, blinded by its paradigm, its domain of thinkable discourse, and thus of his language, his neurolinguistic programming and social conditioning. He had no idea that alchemy was a mish-mash of mumbo-jumbo and specious reasoning.

Likewise, most modern physicists have no idea what future understanding will make today's popular speculations and misinterpretations seem as ridiculous as Newton's worst. More importantly, why and how great minds host great insight and utter nonsense at the same time is rarely (if ever) considered important enough for major study and regular discussion. How could so many scientists and mathematicians fail to question all the subsequent basics taken for granted as absolute truths?

Recall that, in Newton's day, European thinking was still largely submerged in Dark Age dogma, perverted ontology, and philosophy subverted by regressive religious elitists and feudal power brokers. Their mental limitations and misconceptions were possible because of the subversion of Western philosophy, linguistics, semiotics and semantics. Thus, many modernists suffer residual subliminal handicaps imposed by Dark Age Bishops, Popes and Robber Barons. The habits and manic-depressive PTSD of unHoly empire, theocratic corruption, barbaric tyranny, war, piracy, deprivation, suppression and repression persist.

Why? As the late Carl Sagan realized, sadly, too many of us are too easily bamboozled, and the longer and worse, the less we want to know about it. We can see such truths

confirmed with each new breach of computer security and system integrity. Each new 'upgrade' of software is almost as unreliable as the versions sold 30 years ago. But now as then, irrational egos thrive on chaos and confusion. For example, all new, improved, software 'fixes' perpetuate vulnerability. Despite ever more patches and inadequate 'security' updates, they remain symptoms of an essentially defective logic infrastructure and a deficient logic paradigm.

Do you doubt that? Well then, whoever asks why a logical logic system needs any patches or fixes, ever?

Right, very few if any of us. Why not? Most mathematicians, computer scientists, economists, professors, teachers, and technicians are normal, busy workers. They have problems to fix, things to do, bills to pay. They all want paychecks, benefits, insurance, amenities and so on. Hence, the aftermath of Dark Age egomania persists.

For most of the reasons given above, more than 2500 years ago, the historical Buddha, Siddhartha Gautama, predicted that this phase of civilization would decline for about 12,000 years. Unfortunately, most great pioneers, scientists, mathematicians, and philosophers of the modern West knew little or nothing about the great wisdom of ancient Asia. Therefore, the 'Enlightenment' of Western civilization failed to fully banish the darkness of ignorant unwisdom.

Then, anti-theistic misconceptions primed modern civilization for increasingly pervasive confusion, credulity, and fascination with wildly speculative hunches and nonsense (worse than the most ridiculous myths). For example, Heisenberg's defective philosophy and anti-religious Nazi mysticism infected maths via the reification and virtual sanctification of statistics, probability theory, and scientific rhetoric (of SM QM).

It replaced the mish-mash of medieval myths, half-baked philosophy, theocratic notions, superstitions, and confusing mumbo-jumbo with a more bewildering yet awe-inspiring mish-mash of new mumbo-jumbo. That caused more mass-confusion, gullibility, bamboozlement, and cynicism. Commercialized science and education grew increasingly more powerful and entrenched. Automatically defended by increasingly incentivized specialization, it increased compartmentalization, development of different domains of knowledge, and jargon known by specialists.

All the scientific and technical disciplines were pressured and funneled into ever more financially rewarding pursuits, more limitations, and more exclusivity. That then ensured ever more specialization, increasingly narrow, more normative education, and systemic defensive mechanisms (overt and covert). The special realms of jargon ensured structural, discipline-specific sociolinguistic silos, by default. That maintains SM status quo and QM semi-reality.

That partially explains Einstein's incomplete critique of semi-reality as described by SM QM theory. He skipped skewering the predominant paradigm of commercial civilization at the heart and root of the problem. It limited what was normally thinkable and discussible. It also discouraged progressive use of adequate bio-ethics, logic, and methods. Now, most scientists and technicians talk and act as if ethics and quality of life are optional. So, we seem to need invisible keys to escape an invisible prison.

Yet, unrecognizable or ignored, the keys were available. They enable viable logic and realism. Luckily, pure science, maths, and logic mostly work with convergent logic, where quantitative values and metrics rule. However, a sustainably effective, global solution requires dealing with convergent and divergent, qualitative problems. They call for using

the theory, metatheory, and strategy of macro-ontology and meta-ontology. That is because being and human mentality and our problems happen in all domains and subdomains of logic and nonphysical metalogical principles.

Here, “logic” and “metalogical principles” refer mainly to nature’s principles of being, physical presence, energy, thought, perception, illusion, delusion, corruption, and other human realities. So, holistic ontology, sociology, and meta-economics can deal with all the divergent problems and illogic of civilization.

Convergent logic only permits finding and using methods for solving problems with causal factors that resolve to a solution, as in engineering, telecomputing technology, equations, puzzles, coding, and cryptography. Most of our worst problems are resolved only by death, capitulation, concession, compromise, cooperation, or creative transformation .

Sadly, most of the time, most of us act like we loathe and fear change. The more radical a change seems, the more we seem to dread it. We love getting nice, reliable solutions to convergent problems and puzzles. We love them because we can solve them, all of them. That gives us the satisfying sense of certainty we love.

We also love quality, sometimes more than quantity, but sometimes not. We dislike our divergent social and physical problems. So, usually, most remain unsolved and unsatisfactory. Unluckily, that reinforces the basis of our problem, pandemic fear and loathing of unsatisfactory experience. For example, convergent problem solving is mostly useless for our worst divergent problems, but we prefer it. Mastering divergent problem solving requires facing our fears, pain, failure, loss, poverty, suffering, shame, death, and other unpleasant, mostly unavoidable realities of this world. So, most of us prefer entertainment, illusions, and hope, while they last.

Yet, almost all human problems are relational problems of the divergent kind, with mostly sociolinguistic causes. So, being confused about the nature of the two kinds of problems, we use the wrong ideas, strategies, and techniques (for solving them). That never enables satisfying results. However, many of us keep using the wrong problem-solving methods over and over again, obsessively.

The reason seems to be civilization’s tendency to foster and reward egocentricity (or monstrosity), while implicitly discouraging ecocentricity (respecting nature, life, and culture). For example, confusing opinion with truth and reality, now pandemic, causes and maintains mass-hostility, violent conflicts, too often to horrific consequences and, potentially, to ecocidal mass-extinction.

So, unproven theorems, hypotheses, conjectures, fictions, and lies are commonly confused with realities. For instance, many physicists, mathematicians, and economists normally talk and act as if maps and models are territories and universes, or elements that make them possible. Yet, trying to keep the current SM physics stuck in its box, will never sustain a culture of normalized confusion, deception, and dysfunctionality. More damage will be the devolutionary, disintegrative, destructiveness caused by:

- a) the socioeconomic structure of technocracy,
- b) its fear-based negativities, and
- c) neurolinguistic mass-programming

Hence, in the media, schools, or wherever—instead of fostering resolution or more effective communication—typical discussions of human problems (politics, etc.) often

reveal subliminal denial (of realities). So, 'politically correct' (PC) verbal "civility" tries to hide deeply entrenched fear of whole truths (and consequences). Divisive aims, negative attitudes, and divergent/deficient opinions then win the day. That obscures or the normal lack of nice, neat, mutually satisfactory solutions to our divergent problems.

Yet, languages of our cultures maintain deficient status quos only until they self-destruct or evolve. Yes, languages, political propaganda, and double-think can make convergent problem-solving strategies and techniques seem like fixes for divergent problems.

Obviously, that delusion only postpones some of the consequences, while fueling worse systemic corruption and normalized institutional incompetence. Not believing that will never sustain a nice, truly safe, but impossible comfort zone. Realizing which kind of problem is which can be difficult, even for logicians and scientific pioneers, but real progress and sustainability require wise choices and effective responses.

That difficulty tends to prolong our worst problems, generating more subliminal fears. However, its subliminal and overt fears—of exposure, of bamboozlement, and proof of inadequacy—make 'normally' socialized ego cause and prolong the difficulty. Naturally, subliminal defensive 'mechanisms' and fears make it extremely difficult to evolve, to new and better ways of thinking about reality, and an alternative to unethical economics, defective politics, war, dystopia, and ecocide.

So, chronic mass-confusion and diversion keeps complicating, obscuring, and reinforcing the linguistic problem, its symptoms—deceptive semantics, propaganda for profit, etc.—and the cure. In fact, mass-deception, misconceptions, false dichotomies, and verbal illusions literally dictate most of civilization's failures. For example, dualistic assumptions, scientific mythicism (sanctified by SM QM maths), and the falsehoods of post-Einsteinian materialism kept perpetuating our worst mistakes. That reinforced our increasingly pandemic of normalized corruption, greed, and egomania.

Post-literate Society

The section header refers to Neil Postman's diagnosis of this post-literate Age of Show Biz. In his classic [*Amusing Ourselves to Death*](#), Postman details the devolution of the literate era of modern civilization, from the Era of Typography to the commercially sponsored televideo pandemonium of today, the Era of Showbiz.

To fully understand the process, recall that previously, despite awful exceptions, for most of the last 12 millennia, most of our ancestors were raised in cultures well-endowed with healthy spiritual values. They served as a bio-ethical standard of quality, conduct, and respect for life, habitat, and nature.

Then, for millennia, science evolved. Progressive culture, discovery, experiment, realization, better communication, cooperation, theory and proof were all fostered by mostly ethical pioneers. They saw credible theory as our best-case description of natural phenomena, but not as explanation of causes considered eternally mysterious and/or supernatural.

However, with the rising power of organized religion, increasingly, viable ontology and phenomenology seemed to threaten status quo theology, social norms, and traditions. So, a truly realistic study of being increasingly dangerous, unprofitable, and of less interest to almost everyone.

So, in the "Holy Roman Empire" of Western and Eastern Europe, truly realistic

ontology and phenomenology were abducted. Good theory was submerged in the rising tide of theological notions and mystifying theorems that “fit” the (Flat Earth) geocentric SM of Ptolemaic cosmology. Of course, it also supported repressive religious dogma, political corruption, defective government, feudalism, and mass-exploitation.

Naturally, that was followed by an increasingly anti-theological backlash, first in science, astronomy, mathematics, then in cosmology. Decreasing explanatory power and the huge increase in “mystifying” anomalies are rationalized by popular scientification, nonrational acausal speculation, and QM inconceivability.

Therefore, even into this century, ontology was not fully rehabbed. Real recovery was delayed by the neurolinguistic residue of the post-medieval paradigm still stuck in brains stuck with modern egos. That reinforced the trend to increasing anti-religious mystification and mythification. It was popularized by increasingly vacuous television (TV) news programming, classic Hollywood-style films, and TV entertainment shows. Then, maths and SM QM cosmology replaced mystic revelation. Now, it serves as a glamorous, very profitable, anti-theological religion of atheistic academics, well-funded researchers, celebrity pop-scientists, and their misguided fans.

As referred to above, popularization and abuse of chaos theory supported more imaginative SM QM cosmology and SciFi fantasies. That made maths seem much sexier. For example, Jurassic Park (the film) glamorized pop chaos. The linguistic semiotics and semantics of maths was mostly ignored, except by Wittgenstein and a few little-known pioneers and iconoclasts.

Likewise, as Kohr and Illich realized, the semiotic, logical and ethical dimensions of economics were mostly forgotten or removed, in favor of ever new econometrics and models, to satisfy the desperate need for more credibility.

NeoFeudalism vs. Nature

As mentioned in Alexis de'Toqueville's book, *Democracy in America*(1831), the mediocre majority unwittingly enabled the rise of a soft tyranny. Gradually, systemic corruption accepted a norm of neoFeudal status quo. It was and is enforced mainly by increasingly pandemic narcissism, egocentricity, vanity, conceit, deceit, greed, fear, and threats (real, etc.).

Now, ongoing neurolinguistic programming of parents and babies maintains crypto-colonial colonization of their egos. Its paradigm is installed in their brains and communities and institutions. That supports the world's military-industrial-commercial bureaucracy, automatically, easily, globally. Thus, ecocentric values, responsibility, and integrity became officially unnecessary or unrealistic, inconvenient, and unaffordable.

Hence, this theory of psychosocial reality seems unpleasant and unsatisfying. For, what we like most about great theory is our satisfaction. Understanding reality seems to make our lives better, more enjoyable or longer (safer), more prosperous or content. So, rejecting or ignoring realistic theory because it describes and explains unpleasant facts about us and our deficiencies prevents solutions and remedies.

However, mainstream economists deliberately ignore those sad truths and facts. They prefer to focus on best guesses about models and assumptions. Then they slightly alter them after real people and real-world events cause surprising disasters. Clearly, most economists think their newest models and maths more important than predicting (or preventing) disasters (and understanding the causes). Still, the unfortunate victims keep

supporting the mainstream status quo of modern economics.

SM physics remains more useful than the economics of neoFeudal technocracy, but it suffers similar human-factor deficiencies. Arguably, it also causes and indirectly rationalizes potentially terminal disasters—like failing nuclear reactors, vast quantities of nuclear waste, and the potentially ecocidal nuclear arms industry. Yes, as a statistical discipline, SM QM usefully predicts how some processes may “work” or will work, but not why, not even why it (QM) works.

Of course, modest QM specialists admit that their work has nothing to do with discovering why or how particles are probable points with inexplicable super-natural powers. (see def., Particles, above) In fact, only corrective “renormalization” makes SM physics “work” as well as it does. Yet, maths is not:

- imprecise measurement (of fractionally detectable evidence)
- probable approximation
- educated guessing
- post-explosion testing
- limited perceptions, and
- theoretically biased interpretations of probable data

So, without all the fudging and doctrinaire/dogmatic interpretations, QM would be obsolete, a relic of antique theory and bad science. Yet, current SM QM is clearly ripe for a major upgrade.

Still, mainstream economists must be very envious of lucky QM physicists. Even now, they get to enjoy super-impressive, multi-billion dollar facilities, and hyper-sexy experiments. Economists might get better results if they talked about the Fed and crazy monetary theory as if they were like ‘Dark Matter’ and ‘Dark Energy’. Of course, all the spooky maths, exotic models, and sciencey rhetoric of SM QM cosmetologists and SM economists directly affect economies, institutions, markets, and the value of investors’ assets. Thus, economists keep using their current stratagems and excuses.

Those facts relate directly to the neurolinguistic root of the current SM problem. In fact, after all their successes, SM QM and economics offer no satisfactory explanation of anything, while confusing almost everyone.

That goes on because QM descriptions and mainstream economics depend on interpretations only of data that ‘fit’ their status quo models, theorems, speculations, and beliefs. Yet those are all based on deficient assumptions and inadequate observation of the part of reality that seems “worth” study and grant-funding. Indirectly yet implicitly, the SM status quo supports deficient/invalid theorems used for rationalizing unethical economics, stupid monetary policy, unnecessary deficit spending, systemic government corruption, and pandemic authoritarian personality syndrome (PAPS).

PAPS is one of the most tragic symptoms of cultural illness aggravated by mass-deception, mass-confusion, and mass-psychosis enabled by and enabling fascism and corporate technocracy. The modern version perfected by Adolph Hitler’s regime was doomed, but only because it was too psychopathic, violent, and corrupt to prevent the rise of mass-stupidity.

The current Euro-American strain exploited by the Trump regime may seem less violent and less stupid. Yet, deliberate ignorance is stupid, and the genocidal Anglo-American war against indigenous peoples and their habitats was atrociously violent.

Biocidal destruction of nature for profit requires the ultimate violence and psychotic stupidity. Yes, mass-disrespect and destruction of habitats and living beings existed long before the USA. However, relative to our general intelligence and opportunities, Americans' historic violence and mass-stupidity is unparalleled.

In fact, the microbial community in a cubic centimeter of healthy soil has more wisdom than all the nations of the world, and no stupidity. For example, like indigenous communities of ancient cultures, a microbial community would never need money it had to borrow from itself, then pay taxes to itself to pay the interest. Naturally, microbial communities would never go to war and pay more taxes for borrowing more of their own money to fight a community in the soil of a foreign forest.

Clearly, the Euro-American neoFeudal trend became the envy of the world by being so good for life-styles of egocentric consumers and anyone unwilling to oppose status quo corruption and mass-stupidity. So, the socioeconomic power of the hyper-rich and the illusory American Dream persist (for a shrinking minority), while becoming unattainable for a rapidly growing majority.

All that depended on mass-confusion caused by mass-deception. For example, the SM paradigms of science, economics, and society are interdependent, interactive elements of technocratic civilization. Continually polluting them with inadequate theorems, hypotheses, misinterpretations, misconceptions, false assumptions, beliefs, and opinions makes it increasingly hard to recognize truths, opinions, and lies. Hence, this is the post-truth era of media and pop-culture. That should be equally troubling and sobering.

Evidently, most SM QM physicists, mathematicians, and economists are unable to understand the nature of the financialist money system that funds, corrupts, and limits science and society. For instance, Einstein failed to fully realize the nature, scope and depth of the problem limiting maths, physics, cosmology, science in general, and the whole of human culture. Of course, without understanding the causes, extent, and underlying dimensions of the linguistic problem, centuries of looking for "how" could never lead directly to the "why" of anything.

If that were not true, then Gödel's incompleteness theorem (GIT) and Tarski's undefinability theorem (TUT) would be untrue and unproven. Yet, both are well proven and true for any axiomatic system of theory, especially SM QM.

Fortunately, holonomic metatheory is not limited by either GIT or TUT. To fully appreciate that truth, reconsider the basics of maths and psychophysical reality. Causal interactions and underlying principles enable and condition all physical things, places, persons, processes, and events, but not the principles that enable everything, including logic, maths, and QM. So, to be effective, maths and science must deal with that reality, all of it (as much as possible).

Naturally, what viable science and maths can study and describe is knowable, provable, the detectable, the observable or the logical. So, good physics must deal with what can be detected, studied, tested, and understood, as it is. The actual reality and ways of a form of being must be studied and understood without blowing it up, then guessing about how it worked by looking at images of parts, bits, and pieces as they scatter this way and that. What can be studied and learned that way is the nature and modes of explosions (of whatever).

So, thermonuclear implosion-explosion events and the environmental effects of nuclear power plants (and radioactive heavy metal waste) show us as much of what we

can detect and/or observe of them (when we do so). It confirms $E = mc^2$ as an equation describing a basic aspect of the observable relationship of interactive energy and matter. It does not describe or define the nature or cause of the whole of being (reality). CERN's super-large, super-expensive devices, electricity bills, and personnel enable explosions that confirmed the desired probabilities of Higgsian SM QM theorists. Yet, they still fail to enable description, definition, and explanation of even the tiny part of the whole field of being as it was before they blew it up.

Of course, the CERN group and their academic believe that their projects are works of pure research, pure science. Yet, truly pure science exists only for the sake of understanding and better knowledge (of natural reality), thus better quality of life. Now, remember, those results require optimum explanation, requiring sufficient definability, enabling adequate description of the results of a study (of the whole of the subject). However, materialistic destruction experts are satisfied with a) CERN's budget, b) their work, c) the results (probability statistics), and d) their interpretations of the data on the explosion artifacts.

Clearly, such SM QM experts fail to care that nobody else is satisfied, with no more, or even less, understanding of reality, nature, energy, matter. and life. That should surprise nobody, because SM Higgsians are satisfied with inexplicable expansions and explosions of nothing nowhere (and everything everywhere else). So, obviously, they like inexplicability better than understanding and effectively pure science.

However, in real science and maths, unconditional logical proof or disproof of anything, backed by real evidence, remain superior to incomplete or conditional proofs, or even a technical proof relying on brute force computation (and deficient theorems). In maths and science, secondary and tertiary level theorems and conditional proofs require accepting both limited understanding and unproven conjectures as necessary (evils) and sufficient (though they are not). They can never explain either actual wholeness or the infinite realities of being or even of cultural interaction. So, the unreal or inferior results of inferior works always fail to explain or improve anything.

Still, even if possible, proving something about how an infinite field of complex phenomena happens could not explain why. On the other hand, good metatheory can answer the why questions of a well-studied reality. Thus, as always, viable metatheory enables perfect proofs, that verify and explain valid theorems, intrinsic logic, and the metalogical principles enabling being and its nature. So, only a durable foundation of good theory and metatheory will enable and sustain an ethical civilization's cultural wellness.

We clearly need a cure, and it always required pervasive adoption of bio-ethical ecometrics, realistic socioeconomic theory, and ethical scientists. The best-case outcome also requires willingness to support healing of the linguistic psychosocial causes of the legal-financial complications. Doing it, progress to truly realistic monetary policy would enable many previously predicted and unimagined benefits, for science and society.

For example, bio-ethical meta-economics could enable effective qualitative and quantitative assessment of human interaction and scientific progress. Yet, that will remain impossible for minds as stagnant as their paradigm. Luckily, human intelligence can transcend normative limits. Clearly though, without understanding the nature and scope of our limits, evolutionary progress is impossible.

Also, without a realistic bio-ethical standard of conduct and community, using only a

strictly quantitative-axiomatic system of analysis, wasted time and opportunity. Strictly quantitative, convergent problem-solving strategies and methods never resolve qualitative problems. Hence, working within the limits of a deficient paradigm always failed to produce satisfactory results.

Making that the constantly normalized status quo of society and science always ensured declining quality, inevitably, globally. The tragedies of our history prove that—to sustain a lively yet stable cultural economy—we need enough understanding to work with nature, not against it. Nature’s primal law of interdependent interaction always guaranteed that our results and quality of life were and still are determined by causes, the quality of our choices and actions. Nature’s intrinsic principles, enabling the logic and illogic governing human activity, are the root causes of our best and worst results.

Without more and better understanding of nature, culture, and ethics, the best possible contributions of science will remain impossible. That explains why the crises in SM science, maths, and society grow worse, as the ecological effects grow more severe, faster. It also points out why mainstream economists always failed to predict crashes, disastrous depressions, and recessions (that deflate/inflate the Bubble Market economy).

Acceptable Risk

From the standpoint of daily life, there is one thing we do know: that we are here for the sake of each other—above all for those upon whose smile and well-being our own happiness depends, and also for the countless unknown souls with whose fate we are connected... Many times a day I realize how much my own outer and inner life is built upon the labors of my fellow men, both living and dead, and how earnestly I must exert myself in order to give in return as much as I have received.

– Albert Einstein

If we do what is necessary, all the odds are in our favor. – Henry Kissinger

Trickle-down theory, the less than elegant metaphor that, if one feeds the horse enough oats, some will pass through to the road for the sparrows. – John Kenneth Galbraith

This short section deals with more of the sociopolitical effects and complications of our historic neurolinguistic problem. So, the opening quotes seem appropriate here. They offer hopeful glimpses of a solution, and focus a bio-ethical spotlight on the dismal socioeconomic context diminishing our rapidly worsening odds.

For example, Einstein’s poignant statement of understanding and appreciation of connectedness may not prove that we humans are here for each other, but the results of biology and ecology confirm it. Even mainstream SM QM confirms interactive universal relativity of all forms and modes of being, however tiny or huge. So, despite Einstein’s questionable realism, his bio-ethical values, optimism, and altruism are commendable.

Despite the [possibly horrific] implication’s of Kissinger’s truism, its applications apply to almost all fields of human activity (and study). Galbraith’s distillation of neoCon/neoLib Voodoo Economics (AKA mainstream macroeconomics, etc.) skewers the unreality of neo-feudal financialism’s toxic propaganda, while rightly denouncing its virulently corrupting Winners Take All plutonomic paradigm. So, we see the light and darkness of modernity’s current SM status quo more clearly using Galbraith’s lense.

First, consider the kind of thinking of social engineers who set the SM trend now accelerating from the late 17th century to now. For example, during World War 2 and the Cold War, politicians, bureaucrats, generals, and high-ranking spy masters thought it best to protect the Euro-American Free World by whatever means necessary. The threat of

mutually assured destruction (MAD), was the main deterrent chosen. Then, *for our own good*, think-tanks, expert engineers and planners, were commissioned to determine our limits of acceptable risk.

Of course, ordinarily ignorant citizens were not consulted, nor informed (of the final determinations and possible consequences). Though MAD was based on a theory developed by a violently paranoid schizophrenic, and later disproven, the same basic strategy determines social control policy today. So, a huge risk mitigation industry tries to minimize liability by 'externalizing' (transferring) costs of damage (to us, our habitat, and the world). The goal? Not optimizing quality of life (QOL) or quality of culture (QOC), and general domestic happiness (GDH), but only maximizing corporate profit and political power. So, we can describe the nature of the strategy with an equation:

Eq. 1: $V = BA_a$

There, **V** symbolizes value. What value? Equation 8, above, defines value as equivalent to benefit, **B**, of and/or realized by **A_a**, appreciative awareness.

That may seem too simple or too insignificant for serious consideration and deep contemplation. However, as Einstein intuited, consideration and appropriate response are virtually synonymous with compassion, requiring empathy. Even in Christianity and non-theistic Buddhism, no virtue is more highly valued than compassion. Also, our ancient ancestors equated divinity (sacredness) with the ultimate goodness, benefit, and value (supreme quality). Nearly 400,000 years ago, our ancestors were burying their dead with funerary blessings and spiritual reverence.

Clearly, if all the scientists, technicians, politicians, economists, and teachers of the last 400 years understood what Einstein, Kissinger, Galbraith, and the first modern humans understood—and always acted accordingly—then our world might resemble a Heaven on Earth, or a civilized Green paradise.

Failing that, how could we expect anything other than the failure of modern civilization?

This world of 7 soon to be 9 billion people is fundamentally different than one with only 1 or 2 billion people. The rules and attitudes appropriate to 18th century social games are now biocidally irresponsible and inappropriate. Still though, antique attitudes poison governments and major corporations. Consider a few consequences:

- 90% of oceanic fish are now gone and over 15% of the things eaten at the base of their food chain are very small or microscopic bits of decomposing plastic.
- Acidification of the ocean (due to heat pollution and excess GHGs) is accelerating, killing coral reefs and reducing plankton populations (reducing fish populations and oxygen production).
- Over 100,000 new chemicals—most of them endocrine disruptors, epigenetic mutagens—are flooding the biosphere, our life-support "system".

Plankton mainly comes from coral reefs and the eggs of creatures that lived there. As acidification reduces coral and plankton populations, while parent, consumer and predator species ingest an ever higher percentage of plastic and other toxins. 150 years ago, plankton were producing over 60% of Earth's atmospheric oxygen. However, the odds are not favoring appropriate response: global habitat restoration and radical reduction of ecocidal industrial production and consumption.

Modern politicians act as if the old anti-ethical business and propaganda as usual games are still good enough. Despite the best new evidence and movements against political inaction—re: radical climate change and mass-extinction—most voters and politicians seem unwilling to get serious, realistic, and sufficiently effective. Naturally, that confirms a diagnosis mass-psychosis.

Still, it seems that even kleptocrats and the hyper-rich must hope for a best-case scenario, at least for themselves. Yet, apparently, dedication to maintaining acceptable risk winning wars and protecting military-industrial development became an addiction feeding political addiction. So, it now seems obvious that modern financial predators are no more sophisticated than primitive hunter-gatherers (taking advantage of instinct, herd behavior, and easy pickings). In fact, top-tier financial predators seem much less intelligent than the early over-kill hunters who drove whole herds over cliffs. Financial predators are practicing mega-overkill after 5,000 years of destructive history.

What's worse? Primitive hunters feel reverent respect for their prey, killing to eat and live, not for perverse pleasure, profit, status, or the desire to conquer and enslave. Kleptocrats and monopolists are not so attuned to the reality of universal life, nature, and the habitat that sustains us all.

Behavioral economists' may not have the whole solution but, at least, they look for and study our actual passions, obsessions, and habits, especially our habitual passion "for persuading ourselves that what we want to believe is true" regardless of disbelief.

Summation

A central aim and result of the theory and metatheory of the atemporal primacy of enabling principles supports the fact that an impossible "Big Bang birth" of universal totality was caused by confusion. The thesis and supporting content also show that the confusion was caused by general failure to recognize and account for the pervasive lack of knowledge of the defects of ordinary languages and how they support normal neuro-linguistic social programming (maintaining mass-confusion, etc.).

Now, in this concluding summary, more scientifically verified facts support the essential realizations. They also confirm the necessity of a major paradigm upgrade, to enable real progress to more unitive theory and a more realistic standard model of science, reality, and being. The following content also supports the necessity of doing science for the sake of better understanding and better quality of life.

Hence, this summation makes it obvious that the key points of this critique of world history and modern society are applicable to the so-called scientific community. For, clearly, what we commonly think of as modern science is inseparable from the minds and egos of scientists. All of us are subject to psychosocial forces and influences at work beneath the surface of civilized society.

For example, chronic failure to remember the simple dynamics of bubble markets is curious yet revealing. Behavioral economist [George Lowenstein cites herd mentality](#), and its false security (re: safety in numbers). Nothing new there, but discovering how neurological responses to danger, threats, and fears relate to economics is relatively new. Consider an atrocious real-world example:

Why were suckers not scared by the amazing Mr. Madoff's improbable success? Because it didn't trigger their primal fear, greed fueled their unreasonable optimism. It short-circuited natural threat response functions and appropriate risk aversion. That

enabled excess risk tolerance, adrenaline addiction, irrational exuberance, and excessive bravado, inappropriate risk taking.

Thus, the pandemic pathology of irresponsible credit card use is actually due to the modern illness of addiction to the win or lose dynamics of modern economics and technocratic neurolinguistic social programming.

For example, brain scans show credit cards having an anesthetic effect (on our brains), literally suppressing rational consideration of scary issues and bad outcomes. So, because we can make "affordable" monthly payments, credit cards trick the brain into not sensing that we're going into debt.

Of course, we can end the plague of plastic loan sharking, theoretically. Some decision makers and corporate sustainability experts can and do integrate healthy strategy with methods that help consumers (and voters) make nondestructive choices. If this were a simpler, more perfect world, producers could protect the sustainability of their annual business cycles and the biosphere by protecting customers from themselves.

We now have good numbers and proof that psychosocial dynamics determine real production and performance. That makes earlier notions of profit incentive obsolete. For simple, routine tasks, increasing compensation works well, to a point. Beyond that point the curve goes flat. In complex, high risk endeavors, high stakes tend to make the brain narrow our focus, limiting or impairing performance. People can care more about winning or losing than their work or why their doing it.

When high performance requires creativity, expansive thinking and innovative approaches to complex problems (with unobvious odds for resolution), high stakes and high pay are typically counter-productive. Therefore, if they were perfectly impartial, ethical agents, directors and stockholders of corporations could stop rewarding heartless psychopaths with insanely high salaries, bonuses, and ultra-huge severance packages.

The financial Meltdown-Bailout catastrophe and the ongoing 737-Max disaster (caused and maintained by the USA's biggest DoD contractor) provide massive historic proof that Devils' bargains really are bad deals. Yet, they remain the most popular con-games in the world. The reasons are tragic, ironic, and bizarre. Behavioral economists see greed as desperation, they call it hyper-motivation. Lowenstein sees greed as "the antithesis of self-interest."

Greed motivates us to get one thing at the expense of other things that may be more valuable or important, immediately or in the long run. The mechanism that keeps us susceptible is called loss aversion. Socially induced envy and jealousy make the brain register a sense of loss, making us desperate to get out of an illusory hole. The tendency to cheat is not from a sense of limited options, but a deep-seated sense of deficiency, insecurity, and inadequacy. That can only be remedied with compassionate education, skillful therapy, or intense self-motivation.

Behavioral economics seeks to demonstrate and document how individual and collective shortsightedness (subliminal stupidity) is caused by the brain's "present bias preference" (we want what we want, now). So, our tendency to laziness and haste, often employed to work against us, can be used for our best possible benefits.

Empowering methods for effective wellness programs for overeaters, over-spenders, over-payers, and over-earners are available. Sadly though, since the two most influential neuro-types are mostly corporate executives, globally transformative results will be lacking until rational governance is pervasive. What's worse is that behavioral

economists, even adequate understanding of neurolinguistic programming, cannot force anyone to care or even think about reprogramming themselves.

Fortunately, healthier social programming can redirect our collective momentum upward, possibly more rapidly than anyone can imagine. Cultures that survive terminal End Game scenarios relatively intact typically develop a new version of the conventional socioeconomic game. Starting or continuing an entirely new nonprofit game based on infinite values and ethical integrity offers a superior option.

All we need for long-term viability is effective assessment of history, seeing how not to make the same mistakes again, how to initiate and sustain a win+win scenario, and then co-create it. First though, we need to make sense of the existing system and envision effective transition. To do it, we need to understand and envision the potentials of a completely new cultural paradigm.

For example, a hybrid economy could spin out of control like the existing money game. It happened in Argentina, twice. The causes were enabled by the lack of sufficient neurolinguistic paradigm upgrade. The people were still stuck with the banking cartel's socioeconomic paradigm. It only enables subversive beliefs about money, credit, value, and success. Obviously, to avoid ultimate failure, civilization needs a new paradigm.

Do we have enough time to accomplish a cure before total collapse unleashes more chaotic destruction? Who knows, but do we have a better alternative?

Paradigm upgrading and cultural evolution take time yet, in crisis, our cultural learning can go into an almost vertical rate of change. This time civilization needs a new paradigm credit system. Our success will depend on pervasively installed biocentric definitions of success and wealth.

As in many ancient gifting cultures, true wealth is a measure of giving, sharing and the ability to give, share and create value or benefit. Will formerly middle-class families and communities refuse modest affluence and a viable transition to sustainable wealth? Probably not, but we will get no help from mainstream risk analysts, economists and academics. Despite the consequences, mainstream economists and risk managers are working for the good of the global military-industrial-financial complex, whether they know it or not.

Clearly, thinking success and ecocidal destruction are compatible is insane and stupid. Seeing wealth as a measure of taking, cheating, hoarding, maniacal greed, and winning (despite ecocidal harms) is psychotic. Thinking we would all refuse a superior alternative to a totally ruined civilization seems silly, at best.

Now, thanks to the Internet, anyone can quickly generate a huge catalog of risks impossible 100 years ago. Again, the time is ripe for a sustainable solution, a bio-ethical 21st century culture. An ethical AI system could help, but not without a major paradigm upgrade. All it takes is enough of us with real commitment to accomplish the mission.

SECTION 6, BIBLIOGRAPHY