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Metaphysical Tunneling: Probabilities of Transient Escape from the Hard Problem

Donald Mender

Abstract

The Hard Problem is reframed as a tetrad of mutually inconsistent metaphysical propositions. Incompatibilities among the four propositions are dispatched not through the metaphysician's customary and futile negation of some particular statement or statements within the tetrad but by introducing flexible quantum-formal links to replace more rigid classical logic connecting the four affirmed assertions. This abstract maneuver, logically reframing the Hard Problem, is made more concrete, pictorially accessible, and empirically testable through a description of subjectivity trapped in a sombrero-shaped potential landscape's circumferential "gutter." The metaphysical landscape's shape, constrained by classical logic, breaks a symmetry hidden by current ignorance of the "Theory of Everything" or TOE, long sought by physicists. The circumferential gutter's status as a collection of metaphysical vacua, each a discrete individual sensorium, obscures subjectivity's relationship to the TOE's physicality. It is argued that changing the tetrad's formal scaffolding from classical to quantum logic allows brief reversible quantum-tunneled ascents by subjectivity from the circumferential gutter of vacua toward full TOE-like symmetry at the central peak of the sombrero-shaped potential. Probabilistically ambiguous attainment of the unknown TOE's presumably unbroken symmetry through tunneling renders subjectivity's relationship to physicality equivocal with regard to the causal closure of physics wrought by immunization of physical laws against intrusions by shifting qualia. Casimir-like effects and the Fourier duality of qualia are suggested as research targets for this experimentally falsifiable set of hypotheses.

Key Words: broken symmetry, causal closure, Hard Problem, inconsistent tetrad, sombrero potential, tunneling

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Introduction

The phrase "Hard Problem," originally coined by David Chalmers (Chalmers, 1995; Chalmers, 1996), challenges metaphysics to

Corresponding author: Donald Mender
Address: Yale University, New Haven, CT, USA
e-mail ✉ donald.mender@yale.edu

interrelate consciousness and physics in a logically self-consistent manner. This paper will address that challenge by reconsidering an internally inconsistent tetrad of metaphysical statements (Campbell, 1984; Lapore and Loewer, 1987; Westphal, 2016) through the lens of a quantum-formal alternative to classical logic. A visually accessible depiction of the challenge and its probabilistically quantum-logical resolution will take the concrete form of a non-negligible distance, transiently traversed by quantum "tunneling," between the gutter and the peak of a metaphysical landscape shaped like a sombrero. The gutter will be understood to be a trap ensnaring metaphysics in the Hard Problem, and the peak will be interpreted as the liberating locus of quantized insight.

By way of preparation, three broad foundational definitions are offered as follows:

(I) - Qualia are to be understood here as the constituents of consciousness (Nagel, 1974). Examples of qualia include raw perceptions of a color, of a musical tone, of a pinprick, of a fragrance, or of a flavor, or the subjective awareness of one's own muscular effort. Non-human sensations, felt for example by a shark or platypus perceiving electrical fields in the environment, may also be regarded as raw qualia. Diffuse emotions, abstract ideas of which one is aware, and any other such conscious experiences are higher order qualia, less raw than simple sensory perceptions, but qualia nonetheless. The constituents of consciousness that are deemed qualia of any order may be regarded as discretely denumerable atomic components but can be additively compounded and, alternatively, may also shade into each other in nondenumerable continua. All of the above notions of qualia can be described with logically conventional syntax by nouns like "sadness" or adjectives like "sweet" and may also entail zero-like nominative placeholder designations such as "void," demarcating unconscious gaps associated with dreamless sleep, syncope, general anesthesia, and coma. However, quantized versions of qualia in the unconventional syntax invoked by quantum cognitivists (Pothos and Busemeyer, 2013; Tsuchiya et al, 2025) require description not by nouns or adjectives but instead by verb-like mathematical operators denoting quantum observables (Margenau, 1977).

(II) - Physics in the context of this discussion is to be viewed in terms of lawlike regularities governing events attached to physical observables, e. g. energy or spin, corresponding to a small subset of qualia, e. g. sensations of muscular effort or vertigo. Empirically well-established examples of lawlike physical regularities include Newtonian, relativistic, and - endowing mainstream physics with a novel logic contravening classical conventions - quantum mechanical principles. It should be noted that each of these regularities, though widely acknowledged by mainstream physicists, can be concretely applied only to its own limited physical domain. Relativity applies practically to very fast and very massive objects, while quantum theory

generally governs very small objects, and both relativistic and quantum physics effectively reduce to Newtonian mechanics at the intermediate scale of everyday human existence. Such concretely limited examples must be distinguished from universally invariant laws comprising the so-called "TOE" or "Theory of Everything" (Coughlin and Dodd, 1991), an elusive holy grail of physics meant to cover all physical domains. The TOE currently entails unknown abstractions without delineated relations to any established empirical facts. The only legitimately presupposed characteristic of the TOE may be its expected centrality at a universally comprehensive scale as an admixture of the abovementioned more restricted physical theories already worked out within smaller domains.

(III) - Causation is to be considered coextensive with more than mere correlation between antecedent and subsequent events. Antecedent and subsequent events become, respectively, causes and effects if and only if, through a thought experiment in a possible alternative world, counterfactual absence of the pertinent effect plausibly follows counterfactual removal of a cause. In non-quantum contexts, classical modal logic is needed to handle counterfactual contingencies in "possible" worlds (Audi, 1995; Kripke, 2017). In quantum contexts, "superpositional" logic is needed to handle counterfactual possibilities in mutually orthogonal worlds and introduces extra wave-like degrees of freedom not included in classical modal logic. More will be said later about modal and superpositional logic in connection with counterfactuals and causality.

This paper, by identifying the crucial logical trap binding metaphysics to the Hard Problem, will aim toward a liberating, novel, quantized recontextualization of causal connections (III) between qualia (I) and physics (II) as defined above. The origin of the problematic trap will be traced to conventional constraints on syntactical connections among four foundational propositions of metaphysics - the core metaphysical "tetrad," interrelating definitions (I), (II), and (III) (Westphal, 2016).

Regarding definition (III), it is of crucial importance that two of the metaphysical tetrad's propositions concern explicitly causal connections between qualia and physics. The two assertions about metaphysical causality are mutually contradictory in classically logical terms, Formal constraints by classical logic will be revealed as the source of internal contradictions afflicting relations between the tetrad's two causal statements.

Insofar as visually accessible schematization of the foregoing ideas as a sombrero-shaped potential landscape is a metaphysically illustrative adaptation from mainstream physics, the attendant danger of a category mistake (Ryle, 2002) conflating physics and metaphysics will be addressed with regard to that adaptation. The landscape's gutter of minimum potentials, running in a concentric well between the sombrero's outer circumferential brim and central crown, will be identified formally with a collection of vacua generated by the breaking

of metaphysical symmetries relating consciousness to physics (Icke, 1995). This paper will recast the set of vacua comprising the gutter and associated broken metaphysical symmetries as coextensive with the logical trap shackling metaphysics to the Hard Problem. The symmetry-broken metaphysics associated with these vacua will be linked formally to the Boolean truth values whereby various past schools of philosophy have negated various propositions within the inconsistent metaphysical tetrad. The metaphysically most fraught symmetry principle violated by Boolean relations among the tetrad's affirmed propositions will be identified as the presumed causal closure (Vincente, 2006) of the still elusive TOE's physical laws, remaining invariant as qualia change.

Quantum syntax posited as a means of escape from the metaphysical trap of the Hard Problem will replace Boolean links among the four metaphysical propositions with a logic that not only is more flexible but also explicitly tethers itself to the question of causality engaged by two of the tetrad's propositions. That is to say, the extra degrees of logical freedom conferred by quantization will be understood not only to generalize Boolean algebra by suspending the so-called distributive law but also to orthogonalize modal counterfactuals by way of superposition. This freer but still causally relevant logic will be shown to enable "tunneled" boosts (Coughlin and Dodd, 1991; Icke, 1995; Turton, 1996) of metaphysics toward evanescent states with both greater symmetry and a higher metaphysical potential than the minima comprising the symmetry-broken sombrero-like landscape's vacuous gutter. Momentary leaps into such fleetingly elevated states will be interpreted as ekstatic epoches, i. e. spontaneously intuitive epiphanies offering ontologically meaningful excursions (Heidegger, 2008) across the explanatory gap (Levine, 1983) between consciousness and physics.

Vehicles for experimental tests of the foregoing ideas will be offered.

Metaphysical Whac-A-Mole

As adumbrated above, the limitations of classical logic can be clarified in relation to the Hard Problem by considering in detail an internally inconsistent tetrad of four metaphysical assertions whose mutual incompatibilities have long complicated the philosophy of mind. There have been several versions of the inconsistent tetrad authored by Campbell, by Westphal, and in condensed triadic form by Lapore and Loewer (Campbell, 1984; Lapore and Loewer, 1987; Westphal, 2016). Campbell's original tetrad asserts the following propositions: A) The human body is a material thing, B) The human mind is a spiritual thing, C) Mind and body interact, D) Spirit and matter do not interact. Westphal's update modifies Campbell's list as follows: A') The mind is a nonphysical thing. B') The body is a physical thing. C') The mind and the body interact. D') Physical and nonphysical things cannot interact.

The economizing triad of Lapore and Loewer, collapsing Campbell's propositions A and B and Westphal's propositions A' and B' into a single proposition A"/B", asserts that: A"/B") The mind and body are distinct. C") The mental and the physical causally interact. D") The physical is causally closed.

Of note is that all past forms of the metaphysical tetrad/triad have engaged the relationship of the mental to the physical without distinguishing between conscious and unconscious aspects of the mind. However, the Hard Problem brackets consideration of unconscious mental processes and targets relations only between consciousness and physics. In the service of narrowing past forms of the metaphysical tetrad to focus on the Hard Problem's specific nexus with consciousness, this paper offers its own modification and synthesis of the tetrad's several prior versions. The newly synthesized tetrad, adapted for the Hard Problem, consists of the following four propositions: 1) the brain is physical; 2) qualia are not physical; 3) qualia and the brain interact causally; 4) physics is causally closed.

The reader may notice in passing that propositions 1 and 2 of the new tetrad adapt to the Hard Problem but, unlike proposition A"/B" of Lapore and Loewer's triad, do not merge Campbell's propositions A and B or Westphal's propositions A' and B'. Of somewhat greater import is that propositions 3 and 4 of the new tetrad, like Campbell's propositions C and D and Westphal's propositions C' and D', remain explicit assertions about the permissible domain of causality within metaphysics.

The essential feature of economization by Lapore and Loewer in proposition D" is deliberately followed in this paper's new proposition 4. The causal unidirectionality of proposition D" replaces the more robust bidirectionality of Campbell's proposition D and Westphal's proposition D'. Propositions D and D' explicitly deny causal influence both by the physical on the mental and by the mental on the physical. However, in the causally rectified proposition D", while the mind is explicitly deemed not to influence physical events - e. g. via telekinesis (Reber and Alcock, 2019) - allowance is implicitly made for the possibility of causal influences by physical events, such as brain processes, on mind.

The causally rectified character of proposition 4, adapted by this paper from Lapore and Loewer's proposition D", will be helpful shortly in informing issues related to emergentism, the dominant metaphysical paradigm underlying contemporary neuroscientific research. Further along in this paper's chain of reasoning, it will also be useful to consider a restated version of proposition 4 as follows: no non-physical cause, i.e., no quale, can violate the laws of physics by affecting physical events. This restatement of proposition 4 will be enlisted later to illuminate the issue of metaphysical symmetry.

Notwithstanding the variety of iterations by Campbell, Westphal, and Lapore and Loewer, classically logical self-consistency for any such version of the inconsistent tetrad/triad requires negation of at least one component proposition's semantic content. This paper's new, consciousness-oriented tetrad, like preceding versions, must also negate one or more component assertions in the context of classical logic. The ongoing challenge thus raised by the Hard Problem and its metaphysical antecedents resembles blowback during the grim game of Whac-A-Mole. As Whac-A-Mole proceeds, a subterranean creature's head protrudes through a hole in the ground, a thwack knocks the animal down into its burrow, but another individual's head pops up through a different hole. Analogously, philosophical input from each historical school of modern Western metaphysics, starting with Cartesian dualism, has, in pursuit of conventionally logical consistency, used negation to "whack" some particular component assertion within some variation of the tetrad. In Whac-A-Mole fashion, the output from each kind of metaphysical negation has been burdened with its own new complication, "popping up" as follows (Priest, 1991; Westphal, 2016):

Negation of propositions A, A', or 1, leading to an assertion that the brain is not physical, has historically undergirded idealism, beginning with the classical empiricist Berkeley. Berkeley's ad hoc imposition of a divine perceiver of matter - for example, God hearing the material stuff comprising a tree falling in the forest when no human or sentient animal's ear is present - was a theologically hedged attempt to account for real physical objects despite their inexplicability by idealism. The hollowness of Berkeley's explanatory attempt by mere fiat constituted idealism's inaugural instance of Whac-A-Mole-like blowback.

Negation of propositions B, B', or 2, leading to an assertion that qualia are physical, has historically undergirded physicalism, reaching back to classical materialists like Hobbes. From its inception through recent times, physicalism has been plagued by Whac-A-Mole-like blowback in the form of thought experiments supporting the ostensibly nonphysical nature of qualia. Possibility-based thought experiments like Chalmers' conjuring of philosophical zombies (Chalmers, 1996) have been used to argue that nonphysical qualia are plausible, while knowledge-based thought experiments like Jackson's account of a color-blinded neuroscientist (Jackson, 1982) have been used to argue that nonphysical qualia are real. Of note is that arguments from possibility have relied on classical modal logic's (Kripke, 2017) appeal to alternate universes with causality-related counterfactuals.

Negation of proposition C, C', or 3, leading to an assertion that qualia and brain matter do not interact causally, has historically undergirded parallelism, pioneered by the classical rationalist Leibniz. Parallelism from the start was troubled by a lack of any basis for intersubjective agreement about law-like physical regularities. Leibniz's problematic response, prefiguring Berkeley, inserted God by fiat, this time as an

ad hoc designer of harmonious initial conditions, a theological side step inviting a Whac-A-Mole-like secular blowback.

Negation of proposition D, D', or 4, allowing violation of physical laws by non-physical causes, has historically undergirded interactive dualism, first articulated by the classical rationalist Descartes. His metaphysics posited bidirectionally causal traffic between mind and matter, permitting not only physical (e. g. brain) processes to influence qualia but also qualia to exert physical effects. However, in line with causally rectified propositions D" and 4, the existence of causal influences by qualia upon physics has never been supported by any conclusive empirical evidence, e. g. for telekinesis, telepathy, or extrasensory perception (Reber and Alcock, 2020). Descartes' infamous dodge entailed double edged Whac-A-Mole-like blowback. First, Descartes notoriously located the putative causal bridge between mind and matter in the pineal gland, whose own materiality begs key questions about the dualistic nature of Cartesian interactionism. Second, in problematic anticipation of both Berkeley and Leibniz, Descartes inserted an ad hoc role for God, this time as an epistemic broker purportedly erasing by fiat any need for metaphysical doubt.

Historically, combinations of negated propositions have led to a variety of additional metaphysical positions. Joint negation of propositions A, A', or 1 and B, B', or 2 has inspired dual aspect theorists and neutral monists. Variants of neutral monism espoused in the past by Spinoza, Hume, and Russell have paid the Whac-A-Mole-like price of rendering propositions C, C', or 3 and D, D', or 4 nonsensical. Similar concerns have also called into question more recent constructs like computational functionalism, the global workspace, attention schema, and integrated information. All these newer perspectives have been based on Claude Shannon's definition of information, sandwiched like neutral monism between the quantitative formalisms of physics and the ostensible incorporeality of mind (Shannon, 1948; Westphal, 2016).

At this moment it is especially important to consider the inconsistent metaphysical tetrad's implications for emergentism, the default philosophical paradigm behind much of today's basic neuroscientific research. Most contemporary neurocognitive science seeks to trace the sensorium's presumed bottom-up emergence from the connectome (Mender, 2016). That emergentist quest assumes consciousness to be a superordinate macro-observable, arising as an aggregate "effect" of subordinate neuronal micro-observables, including intraneuronal activation states and interneuronal synaptic strengths. The assumption takes its cues from classical statistical mechanics, which posits the macroscopic emergence of thermodynamic observables like temperature and pressure from collective interrelations among individual particles possessing microscopic observables like position and momentum.

For the sake of clarity, emergentism should be disentangled from the philosophical perspective known as epiphenomalism. Unlike emergentist theoreticians and their practical advocates among neurocognitive researchers, pure epiphenomenalists are uncommon today. However, epiphenomenalism shares with its more popular emergentist cousin one presumption: both stances rectify metaphysical causality. That is, both emergentists and epiphenomenalists recognize the influence of physical events on consciousness but deny the influence of consciousness on physical events, which remain causally closed as per proposition D" and 4. Nevertheless, epiphenomenalism is structurally less rich than emergentism because of epiphenomenalist inattention to both the emergent scale and the emergent degree of order exhibited by conscious phenomena and their physical substrates. This relative shortcoming of epiphenomenalism represents a failure to take into account physical blowback from the statistical mechanics inspiring emergentism. Epiphenomenalists, speaking metaphorically rather than thermodynamically, compare conscious qualia to ghost-like "exhaust" from causally efficacious neurophysical engines; this metaphor is meant to convey a causally rectifying lack of reciprocal influence by qualia upon brain matter. Nevertheless, physical exhaust from a physical engine, unlike the epiphenomenalist metaphor for consciousness, is a real physical entity whose high entropy exerts dissipative physical effects, manifested by heat radiated from the physical engine that is the brain. All this confusion leaves epiphenomenalism with a peculiarly ambiguous relationship to the metaphysical tetrad: proposition B, B', and 2, asserting the non-physicality of consciousness, is both theoretically affirmed and empirically negated.

For the sake of additional clarity, the philosophical perspective known as functionalism should be mentioned, since functionalists significantly influence contemporary scientific practice. Techniques for "computing" cognition, functionally likened to "software" that happens to run on the brain's "wetware," are currently an active subset of neuroscientific investigation. However, this research agenda is limited by functionalism's deficiencies. The incompatibility of functionalism with intentional aspects of consciousness has been propounded by Searle's Chinese Room argument (Searle, 1990). Of note is that computational functionalism shares with epiphenomenalism a lack of emergentism's engagement with scale.

Emergentism has the virtue of amenability to formal mathematical modeling of its combined attention to both scale and rectified causality. Extensive emergentist modeling has been accomplished through analogies with states evolving in the continuum of Gibbsian phase space (Gibbs, 2010) and with semigroup operations on discontinuous lattices (Wilson, 1979). Nevertheless, despite formal rigor and widespread neuroscientific influence, emergentism's analogies, assuming neurocognitive isomorphisms with the well

established connections between statistical microphysics and macroscopic thermodynamics, fail to grapple fully with core metaphysical issues. All thermodynamic macro-observables, (e. g. a system's temperature and pressure), though distinct from physical micro-observables (e. g. the position and momentum of individual material particles), are themselves physical (Reason and Shah, 2021), whereas consciousness cannot be assumed to emerge from neurophysics without the Whac-A-Mole-like blowback of begging the Hard Problem's central question - what is the nature of the relationship between physics and consciousness (Chalmers, 1995; Chalmers, 1996). Hence, emergentism like epiphenomenalism has an ambiguous truth status regarding propositions B, B', and 2, and toggles endlessly between negation and affirmation of physicalism (Westphal, 2016).

At this point a few preliminary remarks should be made about the general risk of category mistakes (Ryle, 2002) in developing this paper's analogy, different as that analogy is from emergentism's problematic parallels with statistical mechanics. This paper will aim to straddle boundaries not between neurophysics and consciousness but between the physical and the metaphysical. Analogical boundary crossings of the latter sort are by no means unheard of. Prominent examples from the past have included: Descartes' quasi-physical "cut," metaphysically slicing the nexus between mind and matter; Leibniz's initial conditions, suggesting differential equations of motion, and his Panglossian optimization, anticipating extremal physics; Hume's atomic perceptions, bundled together like molecules; Kant's a priori synthetic categories, shaping epistemology like lenses biasing optics; Hegel's dialectics, unfolding idealism's arrow of time; Nietzsche's eternal recurrence, evoking aspects of Poincare's theorem; Heidegger's penumbral field, projecting outward around Dasein; and Popper's quasi-Darwinian metascience, whereby experimental filters winnow away empirically unfit conjectural variations. Although caution is needed in drawing a formal analogy between any category and its superordinate metacategory, sometimes associations and inferences ranging from the synechdochically poetic to the formally fractal may prove to be at least heuristically productive. Later, as this paper's argument progresses, more will be said about the effectiveness of quantizing metaphysics in holistically bypassing emergentism's inadequately questioned distinction between ontological properties at micro- versus macro-scales.

Quantizing Syntactical Joints

The complexity already encountered in the foregoing account, with its broad catalogue of twists, turns, ambiguities, paradoxes, and no-wins encountered by players of metaphysical Whac-A-Mole over the last five hundred years, underscores the futility of Western philosophy's traditional strategy for relating consciousness to physics. Semantic

content has been variously negated within this or that individually selected proposition of an inconsistent metaphysical tetrad, yet such negations, underlying philosophical approaches as diverse as interactive substance dualism, parallelism, idealism, physicalism, neutral monism, functionalism, epiphenomenalism, and emergentism, have failed to produce any generally accepted solution of the Hard Problem.

The time is right for metaphysics to move away from debate about the relative semantic merits of negating this or that content and to turn instead toward syntax. Specifically, the standard classical logic rigidly binding together the four mutually inconsistent propositions of a tetrad should be loosened. Adding extra degrees of logical freedom will unshackle bonds among propositions and thus efface the contradictions that have chronically plagued metaphysical tetrads.

Interpropositional symmetry and its breakage through selective negation, not to be confused with other kinds of intact and broken symmetry to be discussed later, are key here. Without negation of any component proposition's content, a self-inconsistent metaphysical tetrad will possess unbroken symmetry among its entirely affirmed propositions. Expansion into a freer post-classical logic will relax the constraining need for symmetry-breaking negation of some arbitrarily selected proposition's semantic content and will thereby permit manifestation of the whole tetrad's unbroken affirmative symmetry.

A geometrical analogy (Abbott, 1992), though not a strict isomorphism, provides an intuitively instructive illustration of interpropositional symmetry's role in this expansive agenda. Consider a tetrahedral solid in 3-dimensional space and its several flat projections squeezed onto a 2-dimensional plane. Planar constraints on the figure's symmetry (analogous here to classical Boolean logic's constraints on the tetrad) are expressed as asymmetrical distortions imposed on the flattened shapes and obscuring some single vertex of the tetrahedron (analogous to one of the tetrad's component propositions being asymmetrically singled out for classical negation). The third dimension of depth (analogous to extra non-classical degrees of logical freedom interrelating the tetrad's component propositions) liberates full symmetry revealing all the vertices of the undistorted 3-dimensional tetrahedron (analogous to none of the tetrad's affirmative components being singled out for negation).

There are multiple possible ways of transcending classical logic in metaphysical (and other sorts of) reasoning. One framework for expansion beyond Boolean algebra is fuzzy logic, incorporating more than the two conventional truth values True and False. A better candidate in the present context is quantum logic (Albert, 1992; Coughlin and Dodd, 1991; Icke, 1995; Penrose, 2005; Susskind and Friedman, 2014; Von Baeyer, 2016), unconventionally juggling the two conventional truth values and particularly well suited not only to loosen Boolean bonds among all four propositions of a tetrad but also

to preserve causal aspects of content inhering specifically within propositions C, C', C", or 3 and D, D', D", or 4. Quantization preserves causality by creating superpositional freedom, which, while relaxing classical modal logic, continues in its own additively wave-like manner to accommodate counterfactual universes. Preservation of causality through superposed counterfactuals has specifically illustrative value: a quantum-tunneled distribution of subjectivity can be mapped across the readily visualized causal structure of an otherwise classically symmetry-broken sombrero-shaped potential, as will be described later in this paper.

Quantization of metaphysical reasoning may be fleshed out through either of two methods. One method is more directly attuned to harmonization among the four abstract propositions of a metaphysical tetrad. The other method lends itself to concrete visualization of subjectivity's escape from the sombrero-shaped potential landscape's "gutter."

The first way to quantize metaphysical reasoning harks back to Schrodinger and Born, seminal physicists who linked quantum phenomena to fluid-like waves representing probabilites (Coughlin and Dodd, 1991). This foundational construct was formalized as the composite "wavefunction" made up of independent components (Baggott, 2011. According to the paradigm, oscillating values of any component are always expressed as probability amplitudes – essentially positive or negative square roots of some positive probability. All components are mutually "superposed" and hence interfere with each other, either constructively or destructively, in a way that renders the total aggregate sum of their probabilities a net positive "unitary" 100%. Probability amplitudes of quantum wavefunctions and their components, all evolving over time, can serve as unorthodox truth values enriching logic. Logical enrichment occurs via relaxation of Boolean algebra's distributive requirement, which demands that, for any propositions p, q, and r, p and (q or r) = (p and q) or (p and r). Novel degrees of nondistributive freedom unleash variability in relative phase relations - the amount of synchrony between crests or troughs of the mutually interfering waves representing independently evolving probability amplitudes. This independence opens up the possibility of coexistence between/among ostensibly contradictory states, such as the simultaneous survival and death of Schrodinger's famous thought-experimental cat, in additive superposition. Instantiation of quantum superposition encompassing all four propositions in a quantized metaphysical tetrad allows the totality of component assertions to be affirmed in aggregate, like Schrodinger's simultaneously live/dead cat, without contradiction.

The second way to quantize metaphysical reasoning draws upon Heisenberg's matrix-mechanical principle of uncertainty - also, like Schrodinger's wave mechanics, a cornerstone of modern physics. The uncertainty principle loosens arithmetical logic by no longer adhering

to the commutative law of multiplication, which requires that, for any two numbers m and n, m x n = n x m. Heisenberg uncertainty jettisons commutation in cases involving specific physically measurable sets of mutually "incompatible" sorts of quantities. Examples of noncommuting quantities include so-called canonically conjugate pairs, e. g. momentum and position, energy and time, and components and resultants of spin (Coughlin and Dodd, 1991). Extra degrees of freedom stemming from the uncertainty principle statistically empower affected physical systems within a limited time frame to "borrow" the energy cost of "tunneling" through barriers that classical physics cannot penetrate (Turton, 1996). Some quantum cognitivists (Pothos and Busemeyer, 2013; Tsuchiya et al, 2025) have recently advocated generalizing noncommutative incompatibility beyond canonically conjugate sets of physical observables, so that sets of qualia, cast as mutually incompatible psychological observables, are no longer required to commute. Generalization along these lines should allow non-zero probabilities of tunneling by subjectivity across the previously mentioned sombrero-shaped potential landscape and hence through geometrical representations of the Hard Problem, thus bending rules governing historically unresolvable games of metaphysical Whac-A-Mole.

This paper will emphasize incompatible observables rather than superposed waves as its principle method of quantizing the Hard Problem in a pictorially accessible manner. To further that strategic priority, generalization of the uncertainty principle's scope beyond physics will be discussed in more detail. Later, the paper will touch upon generalization of superpositionally counterfactual histories beyond physics in order to demonstrate that, in efforts to quantize metaphysics, superposed waves are consistent with the uncertainty-oriented model of tunneled debt.

The Dialectics of Causal Closure

A clarification of one more term is now in order. The meaning of the word "symmetry" in its most general, mathematical sense (Coughlin and Dodd, 1991; Icke, 1995; Penrose, 2005) will be laid out to frame the role of I) metaphysical symmetry-breaking in making the Hard Problem hard and II) quantization in the project of restoring metaphysical symmetry. An important lynchpin of that framing will be symmetry's central place in the causal closure of physics, required by propositions D" and 4.

Mathematical symmetry can be understood as follows: if some property X remains the same while another property Y changes, then property X is said to exhibit symmetry under a transformation of property Y. The everyday phenomenon of bilateral symmetry, preserving a human face's appearance in the mirror despite the reflection's switching of left and right, is only one kind of mathematical

symmetry. Other concrete instances include the invariant shape of an equilateral triangle when rotated 120 degrees and the invariance of an electrical field's flux lines when positive and negative source charges are interchanged. Symmetry generalized through mathematics pertinent to physics offers not only these relatively tangible examples but also other, more abstract invariances, entailing numbers conserved and law-like equations unchanged by theoretical transformations such as rotation in isospin space and color charge exchange by quarks.

An equivalence can be drawn between, on one hand, symmetry and, on the other hand, disorder, entropy, and the absence of information. The simple familiar example of mirror symmetry mentioned above can provide a specific intuitive illustration of the broad principle that symmetry and disorder are equivalent. Consider that a human face exhibits mirror symmetry, but a human hand does not. Exchanging left and right through reflection in a mirror leaves a human face's appearance unchanged, but the same reflective left/right exchange turns a left hand into a right hand and a right hand into a left hand. One can say that the directional information provided by an arrow asymmetrically ordering the left/right axis remains discernable in the reflected hand's asymmetry but is obscured by the bidirectional entropy of the reflected face's symmetry.

Abstract mathematical symmetry is succinctly and rigorously expressed in the formalisms of algebraic "groups." Group algebras (Wrightman, 1993) formalize unbroken symmetry through their four multiplicative properties of closure, identity, inversion, and associativity. Multiplying any given elements of a group always yields another element within that same closed group. Multiplying any given element of a group by an "identity element" - e. g. by the number 1 in arithmetic - always yields that same given element. Multiplying any given element of a group by its inverse element - e. g. by the reciprocal number in arithmetic - always yields the identity element. Multiplying three or more elements of a group in any arbitrarily nested order of associations - e. g. a x (b x c) in ordinary algebra - always yields an outcome identical to the product of the same elements multiplied together in any other associative order – e. g. (a x b) x c.

A distinction useful in physics is made between global symmetries, describing invariances of properties when all parts of a system are changed in the same way, and local symmetries, imposing more robust invariances of properties when different parts of a system are changed in different ways. Laws of physics may depend on relationships between global and local symmetries. In particular, transition from the global to the local version of a given symmetry can spawn a so-called gauge field with causal efficacy as a physical force. One simple "toy" example of a physically causal gauge field can be found in the genesis of elastic forces within a very thin rubber disk. Rotation of the disk, always lying flat on a tabletop, through an arbitrarily chosen number

of degrees around a central axis will preserve the circular shape of the disk's circumferential edge. If all points everywhere on the flat disk rotate the same number of degrees in the same clockwise or counterclockwise direction, the rotational symmetry demonstrated by invariance of the edge's circular shape will be global. However, one may imagine slightly pinching several points on the rubber surface and, with care to preserve the disk's general flatness and the edge's circular shape, rotating each of those slightly pinched points through its own unique number of degrees, different from other points. Under such conditions, the symmetry generated by preservation of the edge's circular shape will be local. Stretch forces created by the local maneuver are calculable as the abstract curvature of a gauge field aggregating all elastic compensations for the shift from the global to the local symmetry of the edge's shape. Though this elastic example is only a simple "toy" illustration, more rarified formulations of gauge fields and their "curvatures," each specified by its own shift from the global to the local version of a particular physical symmetry, describe the four fundamental forces of physics. Of these, three - electromagnetic, weak, and strong - are quantized via quantum field theory. Additionally, per the as yet unquantized general theory of relativity, the fourth fundamental physical force, gravity, acts as a gauge of transitions from the global invariance of physical laws in unaccelerated reference frames to the local covariance of physical laws in accelerating reference frames. If the causal closure of physics is valid, then gauge formulations of the four fundamental forces – electromagnetic, weak, strong, and gravitational – in toto should account for all physical causes (Coughlin and Dodd, 1991; Icke, 1995), precluding causal influences on physics by other factors such as those in the psychological domain. This preclusion of psychology implies that physical laws governing all four fundamental forces, insofar as those laws are causally closed off from any breaches by conscious phenomena, demonstrate local gauge invariance under transformations of qualia.

Transformations of qualia, irrespective of global versus local status, are familiar to phenomenology. The associated mutability of consciousness may flow subtly and continuously as described by William James (James, 1890) or may reduce to brute atomistic permutations among qualia, i.e., "interqualitative transformations." This paper will make atomistic permutations among qualia conceptually accessible in relation to causally closed physics through a novel thought experiment, informed by the famous inverted qualia ((Locke, 2008) and Beetle-in-the-Box (Wittgenstein, 1958) arguments and by modal logic (Kripke, 2017). The new thought experiment starts by imagining what it might feel like (Nagel, 1974), through the medium of symmetry under interqualitative transformations, to inhabit the first-person reference frame – i. e. the sensorium - of a slightly different version of oneself with a slightly different ensemble of qualia. In such a scheme, any implied exchanges among qualia mediating translation

from one such sensorium to another must traverse the permutative distance between two slightly different patterns of qualia, either pattern not only slightly distinct from the other but also unique among all the more radically disparate patterns of qualia distinguishing all possible sensoria – both human and non-human. The causal closure of physics requires all possible permutations of all possible qualia - raw sensations, higher order experiences, and null place-holders - spanning all possible sensoria to leave physical laws invariant. Because of this invariance, causally closed physics allows a quale to signify meanings only intrinsically (Searle, 1998) through holistically (Kearney, 1994) intentional, unpermuted semiotic relations with signified qualia subsumed by the signifier's own unique sensorium. Hence, physical cues, including behaving bodies of persons other than oneself, cannot penetrate the problem of other minds by directly transmitting what permuted qualia within someone else's sensorium feel like.

The invariance of causally closed physical laws under interqualitative permutations is important to metaphysics beyond the problematic relationship between a semiotically self-contained sensorium and other minds. Specifically, the gauge-theoretically significant transition from global to local symmetry offers insights drawing upon those of anomalous materialism (Davidson, 1970; Westphal, 2016). A starting point in pursuing this line of thinking is the idea that invariance of physical laws under global interqualitative permutations requires restriction of permutability to those qualia sharing traits belonging to the same "natural kind." For example, "color-inverted" swaps between perceptions of red and green might be considered global transformations insofar as common sense sees color as an apt superordinate category of quale. In contrast, invariance of physical laws under local interqualitative permutations can achieve a finer resolution by accommodating exchanges involving not just qualia of the same natural kind but also qualia from different, perhaps randomly selected categories. For example, swaps between perceptions of red and sour might be considered local transformations insofar as common sense sees color and taste as different superordinate categories of quale.

Coarse-grained generalizations from local to global interqualitative transformations require an inductive mode of pseudo-reason, intuitively conjuring superordinate regularities from accumulated patterns of empirical facts (Hume, 2007) without recourse to rigorous deduction of corollaries from antecedent premises. This limitation on the rigor of induction impacts both the ancient problem of natural kinds as objectively undefinable and the more recently recognized problem of psychology's anomalous illogic compared with the law-like regularities of physics (Davidson, 1970; Quine and Ullian, 1978].

The interrelated challenges of natural kinds and anomalies of the psyche are laid bare by gauge-theoretic global to local reversal of the

inductive transition from local to global physical symmetry under interqualitative transformations. The reversal can be illuminated by considering the concept of supervenience. Any property A supervenes upon property B, if a change in property B requires a change in property A. The causal closure of physics is consistent with qualia supervening upon physical states, but the reverse – physical states supervening upon qualia - is a poor fit. That is, physics cannot depend on any putative agency originating from interqualitative transformations without some sort of telekinetic effect disrupting the causal closure of physical laws. Correlations of physical states and conscious experiences conforming to this unidirectional supervenient proscription are maximized through transition from qualia sorted by type to unsorted token qualia, i. e., respectively, from classes of inductively agglomerated qualitative experiences to the myriad of individual qualitative experiences not necessarily lumped into any "natural kinds" of uniform groups (Davidson, 1970; Westphal, 2016). Transitions from experiential types to experiential tokens can be related to shifts from interqualitatively global to local transformations, under which the non-supervenience of physics upon qualia becomes fully consistent with an interqualitative gauge invariance of physical laws. An interqualitative gauge field, analogous to a physical gauge field, can thus be understood as a construct forbidding the supervenience of physical states upon qualia whose "natural" agglomerations dissolve in transition from type to token. The pertinent gauge curvature is an empirically credible map of consciousness seen to be dependent on physics but physically anomalous, without rigorous law-like regularities like those governing ostensible physical substrates of consciousness.

The interface between gauge-invariant physical laws and locally mutating qualia has evolved a variety of guises, spun out through a dialectic of paradigmatic crises and advances across the history of science. The causal closure of theoretical physics has navigated repeated challenges to orthodox dogmas by aberrant qualia experienced by scientists via crucial experiments. These aberrations have prompted conceptual progress, adjusting established physical laws to recapture the causal closure of physics in ever more empirically inclusive theoretical registers (Losee, 2001). The process of crisis and advance has been repeated at many different times and places. In perhaps the most famous example, the Michelson-Morley experiment's unexpected failure to detect predicted behaviors of light was followed by a major paradigmatic change, within whose newly conceived light cones the causally closed physics of Galileo's mechanical relativity remerged in the revolutionary framework of Einstein's electrodynamical relativity. Currently, observed oddities such as the universe's mysteriously accelerating expansion, provisionally attributed to a poorly understood "dark" species of energy (Penrose, 2005) outside the explanatory or predictive power of

today's physics, have stimulated calls for the next theoretical adjustment.

Physicists have tried to aim the future of the scientific dialectic toward convergence of theory and experiment in a final unified but as yet unspecified TOE (Coughlin and Dodd, 1991). Though at present the exact physical laws of the TOE remain unknown, their presumably exhaustive nature might be expected to end, either as an asymptotically approached limit or as an actual terminus, in causal closure that is complete, without any further empirically driven crises.

This expectation, if eventually realized as an actual terminus, will require the TOE's physical laws to demonstrate truly comprehensive invariance under any and all possible transformations of any and all possible qualia. Hence, the symmetry of the TOE's physical laws will have to prevail not merely in rigidly circumscribed ways under globally uniform interqualitative transformations; the physical laws of the TOE will also have to possess flexibly generalized gauge symmetry under locally arbitrary interqualitative transformations.

The Metaphysical Fissure

Science might indeed be journeying toward a TOE characterized by unbroken global and local symmetries of unified physical laws under any and all transformations of any and all qualia. However, a pivotal stumbling block may be encountered en route. This complication is closely related to insights by the classical empiricist John Locke (Locke, 2008).

Locke's empirical dualism divides experiential qualities, i. e. the psychological observables constituting qualia, into two different categories: "primary" and "secondary." Secondary qualities are "what it is like" subjectively (Nagel, 1974) to hear a musical note, to see redness, to taste sweetness, etc., whereas primary qualities are what it feels like subjectively to lift a heavy object, to put on a burst of speed, to turn, etc. Only primary qualities correspond to physical observables such as energy, velocity, or angular momentum; secondary qualities offer no such correspondence. The distinction between primary and secondary qualities discloses a specific metaphysical fissure breaking the symmetry of physical laws under transformations of qualia, at least in the current absence of any definite invariant provided by an explicit TOE.

The general notion of symmetry-breaking, apart from any special considerations regarding qualia, merits explanation. Broken symmetry is a broad mathematical concept whose main application to date has been the formal description of physical systems with symmetries whose full underlying manifestations are hidden. A brief overview of physical symmetry-breaking (Coughlin and Dodd, 1991;

Icke, 1995; Penrose, 2005) will be presented here to lay the groundwork for extrapolation to metaphysics.

One familiar example of physical symmetry-breaking can be found in the behavior of iron filings. Without constraint by a magnetic field, such filings tend to orient themselves randomly in space. This collective lack of any statistically preferred spatial direction constitutes an overall net invariance under rotational transformations. However, iron filings influenced by a magnetic field line up together in a single preferred direction, "breaking" the system's aggregate rotational symmetry.

Contemporary science's gross ignorance of the TOE points toward examples of purely physical symmetry-breaking more abstract than magnetization of iron filings. The fully intact symmetry anticipated for the future TOE's ultimate physical laws appears at present to be broken not only by Locke's metaphysical distinction between primary and secondary qualities. The presumed TOE's symmetry is also broken by a mismatched pair of penultimate physical sub-symmetries whose shared physical observables (e. g. energy, velocity, or angular momentum) correspond only to primary qualities (e. g a sense of effort, motion, or vertigo) and not to secondary qualities (e. g. redness, a musical note, or a sweet taste). One such physical sub-symmetry is associated with general relativity; the other sub-symmetry is associated with the standard model attached to quantum field theory.

These two penultimate physical sub-symmetries, constituting the putative TOE's aspirational building blocks, noticeably clash at the miniscule Planck scale, which reveals that today's science has no smooth way of knitting together the jagged edges of those building blocks (Penrose, 2005). Beyond the apparent incompatibility of general relativity and the standard model, physics at present also must grapple with empirical enigmas like the universe's accelerating expansion (Penrose, 2005; Zee, 2018) and the so-called vacuum energy catastrophe (Haramein and Baker, 2019); neither penultimate physical sub-symmetry can account for these anomalies. All the above challenges – the conflict between general relativity and the standard model along with the universe's accelerating expansion and the vacuum energy catastrophe – haunt science as now conceived through the lens of strictly physical observables, and also haunt the superordinate project of realizing a metaphysically contextualized TOE. As previously noted, that superordinate project, anticipating exhaustively closed physical causation, aims for unified physical laws possessing full, unbroken symmetry under transformations among any and all qualia - a seamless admixture of primary qualities, corresponding to physical observables, and secondary qualities, presumed extraneous to physics.

The mathematical essentials of broken symmetry, abstracted from particular physical and metaphysical instantiations like those just discussed, are formalized by the group algebra already introduced in

this paper's earlier general discussion of symmetry. Besides the four previously mentioned properties pertinent to symmetry, a fifth group-algebraic property, concerning subgroups, is specifically related to symmetry-breaking. Group algebras (Wrightman, 1993) allow certain subsets of elements embedded within a given group to possess the four group algebraic properties of closure, identity, inversion, and associativity. Such a subset, possessing the four group algebraic properties, itself constitutes a smaller group - namely a subgroup of the larger original embedding group. Subgroups defined as smaller embedded groups within larger embedding groups serve to capture key aspects of broken symmetry. Hence, for example, the group capturing the limited symmetry of general relativity's covariant physics alone may be an embedded subgroup of some larger embedding group, perhaps related to the TOE, presumably embracing both general relativity and the standard model. Similarly, the group capturing the limited symmetry of the standard model alone may be an embedded subgroup of some larger embedding group, perhaps related to the TOE, presumably embracing both the standard model and general relativity. Another pair of subgroups, possibly embedded in the TOE's maximal embedding group, might permute primary Lockean qualities in isolation and secondary Lockean qualities in isolation but not both kinds of qualia mixed together.

That said, intuitive understanding of the superordinate metaphysical challenge posed by Lockean symmetry-breaking may be more readily developed by an easily visualized picture than by abstract group algebra. Toward this end, it will be useful to introduce a simple architectural model - the stripped down blueprint, as it were, of generically broken symmetry characterizing a generically fragmented physical theory. Such a structure has the shape of a sombrero (Icke, 1995), mentioned earlier in this paper.

As a first heuristic step, one can imagine the shape to be an actual sombrero sitting on a horizontal table top. Trial rotations of the entire sombrero around a variety of vertical axis will demonstrate that the central peak of the crown is the only choice of axis possessing fully unbroken radial symmetry.

As a second heuristic step, the surface of the sombrero can be imagined not as an actual rotating hat but instead as the shape of a static landscape on which a ball bearing rolls under the influence of a gravity-like energy potential. The ball bearing, if perched on the central peak of the sombrero landscape's crown, will not linger there but instead will roll downward, because the peak represents an unstable potential maximum. While initially poised in momentary stasis at the peak, the ball bearing will be free, with a full radial symmetry of possibilities, to embark on the beginning of a downward trajectory in any centrifugal direction. However, once the ball bearing starts rolling, it will immediately commit to one actual symmetry-breaking downhill

trajectory among all possible pathways in all possible centrifugal directions.

Any such centrifugal pathway, if it has become the actual centrifugal pathway, will bring the ball bearing down into the sombrero landscape's circumferential gutter, a circular collection of points, each point representing a stable energy minimum or vacuum state. The ball bearing will finally settle at some single point, i. e. some single vacuum state, in the gutter. In this way, the doubly inflected shape of the sombrero, unlike the simpler u-shape of, say, an inverted skull cap or a bowl, will assure that the most spontaneously stable set of possible outcomes (i. e. the ball bearing settling somewhere in the circumferential energy-minimal gutter) is not the most rotationally symmetrical configuration (i. e. the ball bearing poised precariously atop the crown's central peak). Dynamically speaking, the energy-minimal gutter's circumferentiality will hide the peak-centric rotational symmetry latent in the inherent radial geometry of the landscape's sombrero-like shape. In this sense, the potential's manifest conformation will break the system's underlying geometric symmetry. Of note is that the ball bearing might spend some time rolling around the entire gutter before eventually coming to rest at a single point. In that case, the system's symmetry will first break globally, across the whole gutter, and then locally, at one particular point within the gutter.

The above blueprint pictorializing symmetry-breaking in physics may be adapted in order to schematize symmetry-breaking in metaphysics. The metaphysical symmetry to be broken is the unbroken invariance of the yet-to-be delineated TOE's unified physical laws under global and local transformations of qualia, including both primary and secondary Lockean qualities. The metaphysical potential, analogous to gravity's pull on a sombrero shaped landscape, is dimensionalized like physical energy but instead might be conceived as an "anti-telekinetic" potential or "ATKP." The ATKP represents the degree to which metaphysically problematic aspects of a subject's volitional agency in the physical world are effaced, reconciling propositions C, C',C", or 3 with D, D', D", or 4 while also harmonizing primary and secondary qualities. Breaking metaphysical symmetry in a manner isomorphic with the visualizably sombrero-like structure of broken physical symmetry sheds light on the Hard Problem by illuminating the three ways, quantified by the ATKP, in which subjectivity can frame itself.

Subjectivity's self-framing determines whether the first person subject objectifies itself a) problematically as an incorporeal individual agent not connected to other individual agents and without causal impact on any physical substrate, b) problematically as a social agent tethered to a collective of other individual agents but without corporeality or causal impact on any physical substrate, or c) as an authentic component integrated into the widest possible plenum of reality,

including not only the subject's own individuality and social context but also the physical cosmos. It will be argued that subjective self-framing corresponds in (a) to broken local metaphysical symmetry, in (b) to broken global metaphysical symmetry, and in (c) to unbroken metaphysical symmetry. Self-frames (a) and (b) but not (c) may be assigned a zero ATKP value.

The ontology of self-frames (a) and (b) can be clarified through the concept of a "metaphysical vacuum." In physics, vacua in an absolute sense are generally understood to be physical states devoid of matter-energy. Analogously, metaphysical vacua can be defined as states of subjectivity without physical efficacy. The is-ought divide distinguishing metaphysics from moral philosophy points toward schools of ethics as expressions of metaphysical vacua. The fact that moral judgments presuppose volitional agency, barred by propositions D, D', D", and 4 from effects on the physical world, narrows the list of relevant ethical philosophies to those predicated on intent rather than consequence. Among modern Western schools of ethics, existentialism (Barrett, 1958; Moran, 2000; Heidegger, 1985; Sartre, 2018) and deontology (Kant, 1996; Kant, 1998) but not utilitarianism (Mill, 1998) meet this criterion.

The agency of the incorporeally individual subject in self-frame (a) is consistent with Sartrean existentialism. Here, incorporeality relates to the general is-ought split between metaphysics and ethics through Sartre's focus on the ontological non-reifiability of consciousness; Sartre wrote that conscious subjectivity, being neither physically objectifiable nor otherwise reifiable, is a "lack, a "hole," "nothingness," and "no thing." However, with reference to the agency of the conscious subject, Sartre along with other existentialists valorized moral choice, whose physical efficacy in the world nevertheless is proscribed by propositions D, D', D". Regarding individuality, Sartre emphasized individuals rather than collectives as existentially authentic moral agents (Barrett, 1958; Moran, 2000; Heidegger, 1985; Sartre, 2018).

The kind of symmetry-breaking entailed in self-frame (a) can be clarified by mapping the existential attributes of incorporeality, individuality, and agency onto the sombrero-shaped potential landscape adapted from physics to metaphysics. Incorporeality in Sartrean terms maps to the metaphysical vacuity of the landscape's gutter. Individuality maps to the lone, unique, singular status of any one point among all the loci of vacua in the gutter. Agency maps to the potential difference between the gutter of minima, assigned ATKP values of zero, and the maximal peak. Mapping self-frame a) to a single point – and not to the collective of points - in the gutter of potential minima expresses the distinctly local nature of the relevant broken metaphysical symmetry.

The agency of the incorporeal collective subject in self-frame (b) is consistent with aspects of deontological ethics (Kant, 1996), Agency in self-frame b) relates to deontology's assignment of priority to intent

rather than consequence in moral valuation. Incorporeality in self-frame (b), as in self-frame a), relates to the general is-ought split between metaphysics and ethics. Collectivity, a feature of self-frame (b) but not of self-frame (a), relates to intersubjectivity woven into the first formulation of Kant's categorical imperative, which requires a moral agent to ""act only according to that maxim whereby you can, at the same time, will that it should become a universal law." In other words, according to Kant one should subscribe to moral laws that would remain self-consistent if accepted by everyone - i. e. by the entire interpersonal collective.

The kind of symmetry-breaking entailed in self-frame (b) can be clarified by mapping the attributes of incorporeality, agency, and collectivity onto the sombrero-shaped potential landscape adapted from physics to metaphysics. Incorporeality for self-frame (b) as for self-frame (a) maps to the metaphysical vacuity of the landscape's gutter. Agency for self-frame (b) as for self-frame (a) maps to the potential difference between the gutter of minima, assigned ATKP values of zero, and the maximal peak. However, collectivity, pertinent to self-frame (b) but not to self-frame (a), maps simultaneously to all the loci of vacua in the gutter and not just to the lone, unique status of any one point; mapping self-frame (b) to the collective of points – and not to a single point - in the gutter of potential minima reveals the distinctly global nature of the relevant broken metaphysical symmetry.

One can think of self-frame (c) as an aspirational species of panpsychism. Self-frame (c) envisions subjectivity's metaphysical transcendence beyond the symmetry-broken self-frames (a) and (b) to engage the fully invariant physical plenum. Subjectivity in self-frame (c) is seen to have escaped from the metaphysically vacuous gutter of the pertinent sombrero-shaped potential landscape and ascended the ATKP gradient to the peak, where both global and local symmetry-breaking dissolve and unbroken metaphysical symmetry governs. From the central, rotationally symmetric vantage point of the peak and its maximally nonzero ATKP value, the downward pull of the vacuous gutter 's zero ATKP values, representing tension between the physical efficacy of volition agents and the causal closure of physics, is unmasked as the expression of a metaphysical pseudo-force, analogous to the physical Coriolus force, merely an artifact of inadequately centered coordinatization.

Nevertheless, the peak, because it is an unstable maximum, can be approached only via a slippery "uphill" route, and therefore ascent from the gutter is relegated to mere aspiration. This caveat may also be understood from a logical viewpoint. If elimination of discordances between consciousness and physicality were possible through access to self-frame (c), classical contradictions among the metaphysical tetrad's four propositions would be reduced to irrelevance. As it is, such a logical resolution must remain merely an unfulfilled goal as long as Boolean logic is used.

Transient Quantum-Restorative Ekstasis

However, through quantization, the goal of reaching the peak and reconciling the tetrad's inconsistencies can temporarily be attained. The following section will demonstrate how quantizing the sombrero-shaped metaphysical potential enables brief debt-leveraged boosts of subjectivity's ATKP value. These transient events may borrow ATKP "credits" to create tunnels penetrating the Boolean trap of the vacuous gutter and allowing a reversible breakout toward the peak of the potential landscape. The subject can thereby access fleeting intimations of quantum-logical reconciliation among the tetrad's propositions. Such time-limited metaphysical transcendence via debt-leveraged tunneling starts with unlimited augmentation of the set of observables governed by uncertainty relations, so that all qualia are so governed. The next several paragraphs will elaborate the above concepts. Thereafter, metaphysical adaptation of wave superposition, a method of quantization equivalent to but less easily visualized than tunneling via the uncertainty principle, will be revisited.

Tunneling is connected with the notion of zero-point energy, a construct of mainstream quantum physics. The phenomenon may be readily visualized through quantizing effects on the previously described model of a classical sombrero-shaped potential landscape. Nonzero virtual energy generated by Heisenberg uncertainty makes that idealized physical model's imaginary ball bearing, even when located in some vacuum state within the gutter of the landscape, behave not only like a discrete particle but also like a wave. The probabilistically wave-like aspect of the ball bearing is continuously smeared out across space and vibrates, so that probabilities of the ball bearing's departure from the fixed point of a vacuum oscillate and include non-zero values. The quantum oscillations can be dissected into two types of vibration, expressing two "degrees of freedom." The first type of vibration globalizes the sombrero-shaped potential's local symmetry-breaking by smearing around the entire gutter each vacuum point at which the ball bearing might be located. Such waves of vibrating probability, whose circumferentially horizontal domain climbs no vertical gradient, undergo essentially spontaneous initiation requiring negligible energy input. The second type of vibration counters the sombrero-shaped potential's global symmetry-breaking by smearing the location of the ball bearing "uphill" to occupy surfaces outside the gutter, i. e. on the crown and brim of the sombrero-shaped potential. Such overflowing waves of vibrating probability have non-negligible energy costs (Icke, 1995; Jibu and Yasue,1994; Vitiello, 2001; Umezawa, 1993). Both the circumferential and the uphill types of vibration, arising by way of quantum uncertainty, do to quantized systems what the second law of thermodynamics does to classical systems: the sombrero shape of the pertinent energy potential landscape is made effectively flatter, symmetry-breaking is lessened,

and the system's energetics thereby evolve toward greater entropy.

In a metaphysical context isomorphic with the vacuum energy vibrations of quantum physics, quantum degrees of freedom might be expected to spawn tunneling by "borrowing" energy, but only from causally open and thus seemingly implausible sources outside the explanatory reach of current mainstream physical laws. However, such theoretically anomalous energy sources are empirically known to exist, may be explained in the future following a now still undefined TOE's expansion of causal closure's domain, and entail observables about which more will be said shortly. Anomalous energy debt-leverage has the capacity first to ease subjectivity in circumferentially vibratory fashion out of self-frame (a) into self-frame (b) and then to mount a more robust vibratory push uphill from self-frame (b) toward self-frame (c). That is, very small quanta of the physically anomalous debt incurred by metaphysical tunneling may first nudge subjectivity out of some single vacuous locus (self-frame (a)) to spread throughout the sombrero-shaped metaphysical potential's entire vacuous gutter (self-frame (b)); the state of subjectivity thus may first move from the broken local metaphysical symmetry of individually incorporeal agency (self-frame (a)) to the broken global metaphysical symmetry of collectively incorporeal agency (self-frame (b)). More substantially debt-leveraged tunneling may then lift collectively incorporeal agency (self-frame (b)) toward higher, non-vacuous territory on the sombrero-shaped metaphysical potential's crown, with an upper limit at the fully symmetrical, maximally entropic state of panpsychist intuition represented by the crown's unstable but rotationally invariant central peak (self-frame (c)).

The existential phenomenologist Heidegger (Barrett, 1958; Moran, 2000; Heidegger, 1985' Heidegger, 2008) hinted at shifts of self-frames like those described above when he resurrected the ancient Greek term "ekstasis," denoting displacement of subjectivity outside itself. Globus (Globus, 2003) explicitly linked Heidegger's thinking to quantized mind-matter relations. In the context of this paper's argument, an ekstatic reading provides a "quantum-Heideggerian" take on the processes by which debt-leveraged metaphysical tunneling first (i) nudges subjectivity out of self-frame (a) into self-frame (b), and then (ii) boosts subjectivity from self-frame (b) toward self-frame (c). Most notably in Heideggerian terms, ekstasis at stage (i) and ekstasis at stage (ii) proceed to substantively different extents. The negligible borrowed energy cost of a "nudge" readily allows durable completion of ekstasis at stage (i), but for ekstasis at stage (ii), the non-negligible borrowed energy cost, combined with the inevitable coming due of debt repayment, means that only reversibly transient, intermittent "boosts" are possible. A quantum Heideggerian might reason that the cost disparity between ekstasis at stage (i) and ekstasis at stage (ii) underlies subjectivity's tendency toward existentially inauthentic defaults into the energetically less costly and more enduring but intersubjectively biased metaphysics of self-frame (b) and not into the

costlier and less enduring but metaphysically balanced and existentially authentic self-frame (c). Full reconciliation between the subjectivity of consciousness and the objectivity of physics in self-frame (c), access to which is encumbered by an energy cost much higher than that of self-frame (b), can assume only the form of a fleetingly hyperaroused (Smith; 1958; Steiner and Barry, 2014) epoche.

In order to formalize such an epoche, reversibly launching the transient but fully symmetrical metaphysical reconciliation in self-frame (c) via quantized ekstasis, a particular kind of algebraic restriction on the uncertainty principle of mainstream physics must be radically relaxed for metaphysics. Quantum physicists have long attached noncommutative uncertainty relations exclusively to particular subsets of physical observables (e. g. energy and time, position and momentum, and components and resultants of angular momentum), corresponding to particular subsets of Locke's primary qualities (e. g. effort and time, location and inertia, and elements of vertigo). This limitation has prevailed because Heisenberg originally configured his uncertainty, created for quantum physics and not for the metaphysics of Locke's primary and secondary qualities, to interrelate only those physical observables whose multiplicative product is a quantity called "action." Multiplicative factors of action are said to be "canonically conjugate" with respect to each other, while related sets of factors inform the physical uncertainty relations of spin and of so-called "second" quantization. Distinctions between canonically conjugate (along with related) observables, which are mutually linked by uncertainty relations, and unrelated sets of observables, which are not mutually linked by uncertainly relations, have constituted a peculiar kind of metaphysical "cut," henceforth to be referred to as the "PKMC." The PKMC is not the same as the classically non-quantum ontological cuts of Cartesian and Leibnizian dualism or the classically non-quantum epistemological cuts distinguishing Locke's primary and secondary qualities. Neither is the PKMC a part of the quantum "measurement problem," insofar as the PKMC does not engage distinctions between a measured physical system and an agent of physical measurement, whether the measurer is regarded as an objective "device" embedded within the material universe (as per GRW, decoherence, many worlds, ensemble, consistency, time-symmetric, Bohmian, and absorber/transactional interpretations) or an observing, conscious subject (as per Von Neumann-Wigner and QBist interpretations). Instead, the PKMC distinguishes quantum uncertainty, attached to canonical conjugate and allied observables, from non-quantum certainty, conventionally attached to qualia comprising all other observables.

The asymmetry of the PKMC's distinction between, on one hand, the quantum uncertainty of canonically conjugate and of related observables and, on the other hand, the classical certainty of other observables must be transcended, if an epoche of fully symmetrical

metaphysical reconciliation is to occur. One might aspire toward full metaphysical symmetry by nullifying uncertainty principles symmetrically for all observables; however, inclusion of canonical conjugate and related observables in such broad nullification flies in the face of empirically established physics. A better route toward full metaphysical symmetry, preserving uncertainty among the canonical conjugate and allied observables crucial to quantum physics, opts to quantize all observables, including not only canonically conjugate and related observables but also non-physical observables - i. e. primary and secondary Lockean qualities - so that all observables become mutually linked through quantum uncertainty. The symmetry of this comprehensive quantization may thereby liberate metaphysics from the PKMC's asymmetrically restrictive mathematical requirement that only canonically conjugate and related observables have uncertainty relations.

The model of quantum cognitive probability proposed by Pothos and Busemeyer more than a decade ago hinges on such an expansion of the uncertainty principle's applicability to include Lockean qualities. The quantized psychophysics proposed by Pothos and Busemeyer, in line with the program of other quantum "interactionists," updates a nineteenth century paradigm by Weber and Fechner, who, prior to the era of quantum physics, had systematized introspective access to Locke's secondary qualities, but without quantization. An important recent source of support for the quantized update of Weber and Fechner by Pothos and Busemeyer has been the empirical demonstration of perceptual "order effects," whereby perceiving the first of two different stimuli biases perception of the second (Pothos and Busemeyer, 2013; Tsuchiya et al, 2025).

Within the limited set of strictly physical quantum observables, the canonically conjugate subset, whose multiplicative products have the dimension of action, are distinguished by their demonstration of not only noncommutativity and uncertainty relations but also another a property called Fourier duality. Fourier-dual observables are each other's Fourier transforms, Fourier transformation being defined by a well-known mathematical function which decomposes complicated waves into their fundamental elements. If the foregoing arguments for generalization of the uncertainty principle to all qualia have tangible merit, then empirical research may eventually detect Fourier duality interrelating pairs of Lockean qualities; thus, a future quest for such patterns, particularly involving secondary qualities, might constitute an important experimental test of this paper's hypotheses. Yet even if Lockean qualities prove empirically to be contingently Fourier-dual, it is still a priori impossible for any Lockean quality, especially in the secondary category, whether multiplied by another Lockean quality or by a canonical physical observable, to be an algebraic factor of products dimensionalized as action (Mender 2020). Hence, extrapolation from current physical laws involving action cannot by itself serve as a mathematically plausible basis for attributing logically

necessary Fourier-duality to quantized Lockean qualities.

Suppose that another basis, violating currently formulated physical laws (Mender, 2013) though not necessarily in conflict with the presently unknown TOE, were ultimately found for making all qualia Fourier-dual and, as an end game, quantizing Lockean qualities. Then expansion of the uncertainty principle's applicability from canonically conjugate observables to all observables, including primary and secondary Lockean qualities, might proceed, but only by incurring a massive increment in deferred energy debt. The reason for the debt increase may be understood through a rough accounting of observables. Physical observables and their corresponding primary Lockean qualities are finite in number, but secondary Lockean qualities constitute a much larger - perhaps infinite – set. These comparative cardinalities suggest that, if generalized uncertainty relations were to link canonically conjugate observables not only with each other but also with the vast array of qualia including primary and secondary Lockean qualities, statistical pressures along an extended chain formed by such links would throttle up the leveraging of borrowed energy over time.

Though the size of resulting debt is potentially huge, anomalous kinds of energy in commensurately large quantities already challenging the cutting edge of contemporary physics might be able to balance the pertinent ledger. Observed but as yet unexplained physical phenomena, such as the previously mentioned vacuum energy catastrophe and accelerating expansion of the universe, may be regarded as vast sources of surplus energy. These anomalous kinds of energy fields are diffusely distributed in physical space where they therefore cannot do work, but inhomogeneous distribution in metaphysical space also entailing ATKP values may turn the anomalies into a priori synthetic (Kant, 1998) springs, poised to bootstrap realignment of metaphysical symmetry-breaking into a fully symmetrical configuration. Thus, the anomalies might indeed be available to do the work of fueling subjectivity's indebted metaphysical tunneling out of the gutter and, transiently, up to the peak of the germane sombrero-shaped potential landscape.

The metaphysical possibility of a fleetingly ekstatic ledger-balancing role for the expanding universe and the vacuum energy catastrophe is contextualized by the history of science, extrapolated toward convergence upon the currently still unknown TOE. The expanding universe's "dark" energy and/or anomalous vacuum energy, acting as supercharged propellants of debt-leveraged probes, may open up glimpses of the projected TOE's unified physical laws and their unbroken symmetry under transformations among Fourier-dual qualia. The nature of the TOE itself is presently hidden and the label "TOE" at this juncture remains a merely generic placeholder, but anomalously energized probes might flesh out fleeting intimations of the TOE's character, as problematic divergences are transiently peeled

back through a fitful Popperian (Popper, 1964) dialectic of interplay between tentative theories and empirically contingent anomalies.

Because tunneling leverages the peeling back of divergences via borrowed energy, associated metaphysical probes can be considered analogous to the virtual particle-waves of contemporary physics (Coughlin and Dodd, 1991; Mender, 2020). Such analogues may supplement future empirical searches for Fourier duality in pairs of Lockean qualities by enabling a second way to test this paper's hypotheses experimentally. This second type of research agenda might seek a metaphysical isomorph of the Casimir effect, a well-established manifestation of virtual particles-waves mediating physical tunneling (Barrow, 2000; Coughlin and Dodd, 1991). Casimir-like manifestations of quantized qualia might be sought in purely perceptual structures, e. g. the quantum-probabilistic phenomenology promoted by quantum interactionists (Pothos and Busemeyer, 2013).

While possible rewards in future psychophysics laboratories thereby beckon, theoretical aspects of ekstasis, Heisenberg uncertainty generalized to all qualia, and the TOE return this discussion to problems long troubling unquantized, mainstream metaphysical emergentism. As previously noted, the standard emergentist position entails a category mistake (Ryle, 2002) portraying consciousness as just another macro-observable, perhaps or perhaps not physical like temperature and emerging from yet not feeding back on micro-physics (Reason and Shah, 2021; Westphal, 2016; Wilson, 1979). This set of ambiguous characteristics relates to the particular cross-section that non-quantized emergentism cuts through metaphysics. Emergentism's cross-sectional cut explicitly distinguishes macro-scales from micro-scales. However, the same cut fails to draw key contrasts between states and observables, both of which, under the rubric of classical physics, have in common with each other passive mathematical descriptors, i. e. variables and functions. A more discriminating cross section is cut by metaphysical quantization, under whose rubric qualia as quantized observables have active verb-like descriptors called "operators" (Margenau, 1977), distinguishable from passive noun-like descriptors of quantum states as functions. Meanwhile, the holism characterizing a quantum wavefunction's distribution and entanglement (Penrose, 2005) dispenses with problematic emergentist concerns about scales in terms of parts versus wholes and about the direction of causal relationships across different scales.

Quantum distinctions between operators and wavefunctions are reminders that there are two previously enumerated ways in which quantization can liberate metaphysics. The first way, reviewed in detail by this paper, generalizes the application of uncertainty relations to all qualia-observables, expressed as operators. The second way, compatible with the first but less emphasized by this paper, entails superposed states. Compatibility of the second way with the first may

be demonstrated by imagining all the possible - i. e. actual and counterfactual - trajectories of subjectivity's movements on the sombrero-shaped potential landscape of metaphysics. The principle of least action in a pre-quantum context obliges "actual" subjectivity to default into the shortest, most direct pathway between the peak of the sombrero's crown and some single, individually vacuous point within the sombrero's gutter. However, quantization relaxes that extremal obligation by bringing into play a discrete multiplicity of counterfactual pathways, each with its own probability, between the peak and a given point in the gutter (Icke, 1995; Parker, 1993). Pathways may include but are by no means limited to a vacuously intersubjective detour around the gutter's circumference. The quantum-superposed range of all possible pathways, both actual and counterfactual, recapitulates the probabilistic expectations of indebted tunneling. Hence, quantized metaphysics can be expressed equivalently through either operators representing observables or wave-functions related to states.

Summary

It has been argued that metaphysics, in order to address the Hard Problem adequately, must escape from the vacuous "gutter" of a potential landscape whose sombrero-like shape models broken metaphysical symmetry. Mind-brain metaphysics is confined within the problematic gutter insofar as classical logic is mistakenly invoked in futile attempts to interrelate the four mutually inconsistent propositions of a metaphysical tetrad. Quantum reasoning, abstracted from physics to metaphysics, offers a probabilistic means of transcending the tetrad's internal inconsistences. Thus, subjectivity can briefly tunnel out from the gutter's metaphysical vacua and upward toward a quantum-equivocal destination at the fully symmetric peak of the sombrero-shaped potential landscape. This hypothesis leads to two empirically testable implications – the Fourier duality of qualia and Casimir-like effects.

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