

EVOLUTION BACKWARD IN TIME: 7

CRYSTALS, POLYHEDRA AND OBSERVER- PARTICIPANCY IN THE COSMOLOGICAL MODELS OF PEIRCE, ANCIENT EGYPT AND EARLY CHINA

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Jerusalem: Gr., *hierousalem*; Heb., *yerushalayim*
(*yarah*, "he threw, cast" + *shalom*, "peace")

Sold to a private collector for US\$2.7 million, Maurizio Cattelan's provocative sculpture of Pope John Paul II struck down by a blasted meteorite is perhaps a sign of heavenly wrath. Holding a crucifix crozier, the pope lies fallen on a red carpet, apparently stoned to death by a meteorite blow to his hip. Possibly, this rock from the heavens signifies gravity's effect, the force acting between matter particles that keeps humans grounded on earth. Yet, the image of the rock-struck pope provokes another idea. At death, could it be that gravity drags each human consciousness down—regardless of moral behavior, unless the person can comprehend cosmic law or what Peirce calls the "reasonableness energizing in the world" (EP 2.72)?

As in pharaonic Egypt, cosmic knowledge in early China was concealed from the commoners, and ancient Chinese myth was historicized by Chinese literati (Allan 1991: 20). Brashier (2005: 275) writes, "The classics explicitly demarcate between the sage who understands cosmological patterns and the benighted masses who only believe in hungry ghosts and spirits; the sage in fact invented ghosts and spirits so that the masses would obey." Still, Peirce asserts that law or reason expresses itself in the cosmos and in intellects that reflect it. To illustrate, a preliminary study of ancient Egyptian and early Chinese cosmological models (King 2009) supports Peirce's idea on the continuity of mind, as well as the scientific view that our cosmos has a holographic mode of operation (Bohm, Pribram, 't Hooft, Susskind,

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Maldacena) with laws treating each direction of time equally. In this study, a comparison of the arcane funerary literature, art and ritual of ancient Egypt with the early Chinese Lî Kî, the stele inscriptions of Ch'in Shih-Huang, the Huainanzi, art, and divination ritual, shows that ascension of consciousness is associated with hybrid evolution backward in time via transformation to a star. Although other immortality options exist in early China (Needham 1975: 93-94), Taoist philosophy also maintains that the perfected immortal could rise up to the stars (95). In both early cultures, the texts explain that the Deceased's position relative to the earth's gravitational field selects a backward-in-time pathway involving semiosis in the whole of nature. Accessing this pathway to a new energy niche depends on knowledge of the polestar's position, the earth's gravitational rotation, the Deceased's upward clockwise movement from the West to true North or earth's element-enriched polar cusp, and quantum signs, that is, a guiding language of geometric forms for the underworld journey such as the sphere, stairway, mountain, eye, spiral, circle with its axis as a gate, and the hybrid, signs charged with information on quantum dynamics and biophysical energy landscape fields for ascension, transformation to mind-energy, and cosmic unification. Put simply, in both cosmologies (King 2004; Major 1993: 47; Puett 2002: 221), the cosmos expands from formlessness to form, and then it collapses via observers that loop back into the past. This same expansion/collapse cosmos is also evident in Peirce's writings, Edgar Allan Poe's intuitive non-fiction "Eureka", William Blake's "Four Zoas" (King 2005: 196-200), Teilhard de Chardin's biophysics (King 2007), and modern cosmology (Davies 2006: 251-253).

The theory of relativity allows time to be warped by motion and gravity, while its mathematics permits wormholes, replete with their faster-than-light, backward-in-time aspect of causal loops. A wormhole is simply a rotating Kerr black hole with its white hole time reverse that casts out matter, and Visser et al. (2003) demonstrated the existence of spacetime geometries containing microscopic traversable wormholes. Even the second law of thermodynamics, which is the tendency of physical systems to evolve from lower to higher entropy states, still allows the probability for something to evolve from a higher to lower entropy state, a backward-in-time aspect. Mind is central to the complete

cosmic system because the act of observation permeates quantum mechanics, according to Wheeler's observer-participancy principle. Both Egyptian and Chinese texts reinforce that mind acts as the cosmic unifying force, suggesting that mind may be the missing element related to 21st Century Physics' search for its "Holy Grail," a theory of quantum gravity to shed light on the Big Bang, microscopic black hole spacetime, and the unification of the four forces.

In an exploration of this biophysics, this essay supports Peirce's idea that mind and matter are interconnected to achieve evolutionary continuity of mind, while emphasizing that spacetime gravity is essential to this goal. In addition, scientists generally agree that the quantum world ruled by quantum mechanics (with its equations resembling the kinetic molecular theory) orders our classical cosmos ruled by general relativity (Wolynes 1996; Musser 2004; Jacobson and Parentani 2005); that is, the classical action of signs seems to be a holographic veil of the molecular world. Also addressed are the metaphysical implications of quantum physics and neuroscience related to the ascent/fall ontological structure of consciousness, as framed by Swiss psychiatrist Ludwig Binswanger in relation to Heidegger's *Being and Time*, as well as other cosmic patterns of creativity that may have been the inspiration for Cattelan's ironic sculpture entitled *La Nona Ora* (The Ninth Hour).

Observer-Participancy

According to John Wheeler, the act of observer-participancy activates a quantum-mechanical probability amplitude (wave height) and "develops definiteness out of indeterminism," (1988: 4-5). Counterintuitively, quantum mechanics allows a measurement, an observation, a choice due to entanglement (Scully 2007: 144; Greene 2004: 199), which has a thermodynamic flavor (Brandão and Plenio 2008). Because of quantum entanglement, which entails the phenomenon of nonlocality, objects can become linked and instantaneously influence one another regardless of distance. In the wake of Wheeler's delayed choice experiment, Paul Davies explains two requirements supporting how life and mind are built into the cosmos at the deepest level—first, the radical idea of present and future observers shaping the far past

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when no observers existed, thereby giving life and mind an indispensable, creative role in the cosmos, and second, an overarching principle or information-theoretic vision of physical laws redolent with “an inbuilt level of looseness or flexibility”, minuscule today but higher in the early cosmos (2006: 248-249), what expresses Peirce’s chance (EP 1.243).

Actually, the radical idea of observer-participancy is present not only in Peirce’s cosmic view, but also in ancient Egyptian and Chinese cosmological models. As Peirce explains, a series of real infinitesimal steps links the present with the past; that is, ideas are continuous (EP 1.314). Peirce describes three modes of consciousness: feeling, the polar sense (action/reaction; will/sense), and plural or synthetic consciousness. The elementary quantum phenomenon with its pure yes-no character is subsumed in Peirce’s polar sense, the consciousness of an instant of time having two sides, what he calls a “sense of a saltus,” while synthetic consciousness comprehends a process covering every instantaneous moment (EP 1.260), what describes quantum entanglement. Explaining that synthetic consciousness assimilates the present and past into a whole, Peirce references Zeno’s experiment on the lack of motion in the synthetic consciousness (EP 1.283). Although the discovery of the quantum Zeno effect is attributed to Sudarshan and Misra (1977), Peirce may have realized circa 1888 that a quantum property could be frozen into place by repeated, closely spaced observations. Nonetheless, Peirce’s pragmatic maxim is that conceptual elements enter logical thought through the “gate of perception” and exit through the “gate of purposive action;” (EP 2.241) implying observer-participancy.

Peirce’s polar sense and the synthetic consciousness inform both the ritualistic mindset of the Egyptian pharaonic priesthood and early Chinese sages. For instance, the secret least-corrupted Egyptian texts identify two opposing afterlife paths in their quantum “regions of the dwarfs”, guiding and exhorting the Deceased to will the ascension star path so the King “assumes the place of a force in the Hereafter—as Atum” (Davis 1977: 167), a self-emerging primeval creator-god and original cosmic mass-generating mechanism. Verbal and image magic in the New Kingdom Book of the Dead entails an action in one sphere bringing about a result elsewhere (Goelet 1994: 146), for the pharaonic priesthood considered the nonlocal Deceased as ubiquitous,

essentially whole or “assuming all forms in the realm of the dead” (Faulkner 1969: Coffin Text 275). Likewise, the *Huainanzi*, an early Chinese text submitted to the Han court in 139 BCE by Liu An, provides a cosmogony of the self-generating Chinese cosmos from formlessness to form, explaining the relationship of *kan-ying*, that is, everything is linked and interacting with everything else, and an action in one part of the cosmos will spontaneously stimulate a response in another part (Puett 2005: 83). Elaborating further about the Zhou dynasties (or Chou 1122 – 222 BCE), Major (1993: 44) explains that *kan-ying* or “the idea of action at a distance, and particularly the idea that events in the subcelestial world can influence the heavens, underlies the theory of the Mandate of Heaven—an idea of the early Zhou, if not before.” Before the Zhou, observer-participancy is evident in Shang (1766 – 1123 BCE) divination, for Sarah Allan (1991: 112-121) comments: “The vast majority of divination inscriptions include only a charge or proposition” with the statement standing for “the intended act; the shell or bone, for the cosmos . . . A statement about what would happen was made in order to elicit a response.” Thus, observer-participancy is present in Peirce, the quantum mindset of both the pharaonic priesthood, who address their afterlife as a phenomenon allowing the evolution of mind to cosmic energy and unification (King 2004; 2005; 2006), and the Chinese sages, who also desire to reverse the process of generation to the condition of the world before time (Major 1993: 47; Puett 2002: 221) based on knowledge of the same gravitational transformation path (King 2009).

The Mind in Root

Related to their transformation path, both ancient Egyptian and early Chinese texts define consciousness as possessing an ascent/fall ontological structure rooted in spacetime gravity. For example, “To follow goodness is to ascend; to follow evil is to plummet.” This Chinese proverb from the third-century BCE *Kuoyii* (Mair 2001: 153) approximates the Egyptian idea of star ascension rather than falling “head-downwards” to a “second death”. Similarly, Peirce states that the Egyptian *Arithmetic* of Aahmes is the oldest book of science conveying “truths”, and then he interjects, “I think if mind has an upward movement, it

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must feel it." (HP 157)

The ascent/fall ontological structure of Being is a meaning matrix having existential significance for *Dasein*, according to Ludwig Binswanger (1930), whose existential psychiatry was influenced by Heidegger's *Sein und Zeit* (1927). Binswanger observed the rising and falling of existence not only in patients such as Ellen West who completed suicide, but also in religious, mythical, and poetic images (1954: 82-83). Addressing Binswanger's analysis of the vertical axis of interior space with its polarity of light and darkness, Foucault states that the vertical ascent/fall temporal movement grasps the primitive meaning of time, where themes of immortality, survival, pure love, and unmediated communication crystallize (1954: 63-65); it is existence via the imagination indicating its own ontological foundation (66).

This ascent/fall ontological foundation is described by the writer Gerard Nerval in *Aurélia*, the poet Rilke in *Duino Elegies*, Dante in *Divine Comedy*, and Mozart in his Egyptian opera "The Magic Flute" where the flute conquers Death by *casting* the protagonists "from the earth heavenward" into the starry night. Likewise, Goethe's Faust achieves ascension after making a pact with Mephistopheles for knowledge, and it can be argued that Marlowe's Dr. Faustus, who realizes that he can leap up to his god (Act V, Scene ii), also consummates the act regardless of moral behavior. After all, the etymology of Mephistopheles is not identified with Satan; rather, it is associated with Hermes Trismegistos, that is, the ancient Egyptian god Thoth (Goebel 1904).

Relative to Peirce's 1906 perspective on ideal causation, perhaps the ascent/fall ontological structure of consciousness can be simply viewed as follows: ascent is determined by ideal causation, while falling is determined by the final causation of gravity. Four elements need clarification to understand this proposition: Peirce's views of time, chance, ideal causation, and final causation.

First, Peirce explains the Past acts upon us in the Present (EP 2.357), while the Future is either destined by the Past or undecided (EP 2.358). The Past houses our knowledge and is the "Existential Mode of Time." (EP 2.358) Second, chance operates in line with the statistical probabilities of the second law of thermodynamics (EP 1.221), for entropy usually increases but a probability exists that entropy decreases. Peirce explains this backward-in-time aspect with an example of how a train traveling at

infinite velocity from Chicago to New York would be instantaneously on all the tracks' points; however, if transit time were "less than nothing it would be moving in the other direction." (EP 1.294) Mathematically, Peirce is referring to negative energy, the arena of black holes, wormholes, and time warps, which he understands (King 2008; Merrill 2002). Objects traveling up to and at the speed of light have ordinary energy associated with time, while objects at higher speeds faster than light have negative energy, that is, objects would be going backward in time or the other direction (Calder 1979: 107-108).

After using the train example, Peirce mentions that philosophy must decide between the expanding universe, the past-chaos to future-different universe, or whether the universe sprang from nothing and will return to the original nothing (EP 1.295). This third cosmic option of an expanding/collapsing cosmos seems to be his preference, an echo of Hegel's idea that pure being and pure nothing are the same that was later developed by Heidegger (1927) as *Dasein's* capacity for transcendence because it originally holds itself out into the nothing. Peirce then states that pure chance survives until the world becomes a perfect symmetrical system of crystallized mind (EP 1.297), what suggests a movement backward in time and his declaration of synechism that "being is a matter of more or less, so as to merge insensibly into nothing." (EP 2.2) Peirce understood that circular continua without singularities are time and space (CP 6.210-212), while it is only the triadic time-sense that prevents our understanding of the character of a crystal (EP 1.549-550n49).

Third, according to Peirce's 1906 view on ideal causation, semiosis encompasses form, multiplicity, and a being of the predicate, that is, a function whose value is either true or false (EP 2.544n22):

That which is communicated from the object through the sign to the Interpretant is a Form. It is not a singular thing; for if a singular thing were first in the Object and afterward in the Interpretant outside the Object, it must thereby cease to be in the Object. The form that is communicated does not necessarily cease to be in one thing when it comes to be in a different thing, because its being is a being of the predicate. The Being of a Form consists in the truth of a conditional proposition. Under given circumstances, something would be true.

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If signs perfuse the cosmos (1905: CP 5.448) and form represents information (Thom 1975: 127), then according to Peirce’s 1906 view on ideal causation, semiosis encompasses form, basing Being or existence once again on a conditional proposition or observer-participancy as in ancient Egypt and China, where the rationale for ascension and transformation to mind-energy (Being) is contextualized within their information-theoretic language of geometric forms (semiosis) embedded in the generality of earth’s vertical gravitational field. Generality (Thirdness) or the degree to which a living system performs a broad range of functions “pours in” upon our perceptual judgments (EP 2.207).

Fourth, a “final” cause relates to the destiny of things (EP 2.464), and gravity is a final cause because it destines things to approach earth’s center (EP 2.465), that is, the earth’s vertical gravitational field points downward. Related to gravity is a law of chance, the Coriolis effect or the deflective effect of the earth’s rotation on all free-moving objects, including the atmosphere, oceans, and perhaps consciousness. The Coriolis effect in the northern hemisphere guides a west-moving entity to the north due to earth’s counterclockwise gravitational rotation. This is the ascension path in ancient Egyptian and Chinese texts (King 2004; 2009). Under given gravitational circumstances then, ascension could be true or false, suggesting that predictions of the ideal of ascension could be based on the Coriolis effect related to the law of gravity.

In David Bohm’s view, the wave function guides the position of the particles, which can respond to active information or DNA and energy supplied by the environment as a whole (fields and particles) so as to direct its self-motion (Bohm and Hiley 1993: 36). Information is the bridge to quantum potential, and a “rudimentary mind-like quality is present even at the level of particle physics” and at subtler levels, and this “*participation*” goes on to a greater collective mind beyond the human species (386). In line with holographic Bohmian mechanics, the Egyptian and Chinese texts identify the same signs (sphere, stairway, mountain, eye, spiral, circle with its axis as a gate, the hybrid) assuring the Deceased of the correct afterlife position determined by the active information of the earth and sun’s electromagnetic fields, as well as the position of stars. So, roughly assessed, the ascent/fall ontological structure of consciousness accommodates

the law of gravity, and according to ancient Egypt and China, positioning predicts ascension or falling, enabling human consciousness to act as a selection agent or Maxwellian Demon. Ascension, then, can be defined as Ideal Causation (semiosis, observer-participancy aided by Coriolis effect) while falling is downward gravitational final causation (semiosis, observer-reaction due to gravity). In Peirce's 1906 writings, ideal causality extends beyond final causality, as Peirce was moving toward the Scholastic recognition of the Latins (Deely 2007: 32-33). Thus, ideal causation is not only evident in Peirce and the Latins, but it is also present in the ascension literature of Egypt and China, showing that reason expresses itself in the cosmos and the intellects that reflect it.

A Vital Assumption

As practiced in ancient Egypt and China, their secret science of gravity, entanglement, and observer-participancy may have improved the probability for ascension due to knowledge about the elementary quantum phenomenon with its pure yes-no character. Accordingly, ancient Egyptian literature, art and ritual express the Pharaoh's cool, omniscient equanimity untrammelled by emotion. Themes such as ascension, self-divinization, and cosmic control are also present in the Chinese *Huainanzi* (Puett 2002: 260). As observed by Scheff et al., who argue that ritual and myth cope with emotional distresses, many scholars (Lévi-Strauss, Turner, Firth, Douglas) report that their myth and ritual analyses emphasize cognitive and verbal aspects, generally excluding emotion (1977: 484). In light of recent research suggesting the processes of brain wiring and rewiring are shaped by mental events (Long 2006: 87) or "self-directed neuroplasticity", the principle that focused training can predictably alter brain function (Schwartz et al. 2005), it is remarkable that Peirce described this principle in 1888 (Spier 2008: 706), while ancient Egyptian and Chinese literature and ritual can be interpreted as a repository of mental instructions designed to alter brain function to achieve the Deceased's willed rational ascension against earth's gravitational field. For example, the mountaintop stele inscriptions of emperor Ch'in Shih-Huang (221-210 BCE) describe the repetitive ritual ascent up seven mountains to

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restore peace, resulting in collective cosmic unity under “one lineage” (Kern 2000: 14; King 2009). This ancient scientific emphasis on reason and practice, that is, cognitive behavioral training, suggests that informed ritual was essential during life for the transformative movement of thought from the emotional limbic system to the rational neocortex, a mindset necessary at death to access “a transmutation into a new form of life,” (CP 1.673) what suggests a higher-ordered, crystallized morphogenesis, something Cattelan’s fallen pope might not have considered.

Night’s Hymn of the Rock

In *Thus Spake Zarathustra* Nietzsche states that the time will come when man will no longer give birth to any star. However, both the pharaonic priesthood and the Chinese sages visualized the Deceased becoming a star in similar, dark, watery holes under the earth, respectively the Duat and the Yellow Springs. It is interesting that descriptions of the watery Chinese underworld Yellow Springs communicate facets of the earth’s geodynamics, for the liquid outer core has a viscosity similar to water (Lister 2008: 701; Aubert et al. 2008), recent dynamo simulations show the generated current is organized as a set of coils in the shape of helical *springs* (Kageyama et al. 2008: 1106), and antineutrinos, which play a central role in radioactive decay and the life and death of stars, have been measured from earth’s interior (Araki et al. 2005; McDonough 2005: 467). Likewise, the Chinese Emperor’s transcendent objective to become a star is described in Huainanzi 4, Section XIX and summarized as the “growth of ores in the earth, vaporization, and condensation” related to gold, lead, copper, silver, iron (Major 1993: 214-215), a sound explanation of core-collapse supernova nucleosynthesis, for it explains the synthesis of heavy elements up to iron. All the post-iron heavy elements are formed by supernova nucleosynthesis.

Also, during the Longshan stage (3000-2000 BCE) of Chinese regional development, the discovery of carved jade tubes (*cong*) suggest “a microcosmic axis mundi” (Chang 1989: 158), which penetrated down to the Yellow Springs underworld and upward to the Gate of Heaven, exhibiting a cosmogonic, holistic, organismic process of continuity with all modalities of being from a rock to heaven, having integral connections (161-162). Similarly, evi-

dence exists that the fiery Egyptian underworld Duat functioned as a microscopic time-reversing black hole (Hornung 1994: 154; King 2004; 2006) as well as a star-house (Gardner 1927: 33, 487), so the Deceased could rise up and “pour out a star,” (Faulkner 1966: 155, §1148 older text). It is interesting that decaying chemical elements within the earth produce high temperatures that may restore broken symmetries, and, in light of our cosmos’ holographic mode of operation, shrinking the rotating earth to .4438 centimeter would result in a black hole (Wolf 1988: 148) and gravitational waves, another prediction of relativity.

Peirce mentions the possibility of matter being built of vortices (EP 2.124), an idea also found in ancient Egypt (King 2004), Teilhard de Chardin, Descartes, and Sidharth (1998), who treats fermions as quantum mechanical Kerr-Newman black holes. Biologists generally agree that protein folding occurs along convergent pathways or folding funnels that guide folding to the protein’s crystallized native state. Today physicists and biologists know that quantum mechanical equations resemble those of kinetic molecular theory (Musser 2004: 89), while spacetime has a molecular structure (Jacobson and Parentani 2005: 4; Wolynes 1996). A protein folding to its native structure exhibits entropy reduction (Socci et al. 1996) or a backward-in-time aspect also evident in current microscopic black hole research implying violation of the second law (Dubovsky and Sibiryakov 2006; Jacobson and Wall 2008). According to Balbín and Andrade (2004), the protein behaves like a Maxwellian Demon or Information Gathering and Using System at an evolutionary time-scale.

To Peirce, thought appears in bees, crystals, and the inorganic (CP 4.551). Crick, Watson, and Caspar thought of viruses as crystals (1956) as do modern virologists. Crick and Watson (1956) predicted that the coats of viruses were composed of repeating subunits exhibiting the symmetry of closed polyhedra. The Peircean theme of crystallized mind, the Egyptian transformation of the dead King into a hybrid pyramidal form of millions, and the four-faced ancestral transformation of the Chinese Yellow Emperor (Huangdi) may point to the polyhedral form of an ancient lambdaoid virus, suggesting the possibility of afterlife horizontal gene transfer and viral lytic replication or cloning (King 2004; 2009). According to Csikszentmihalyi, the Chinese

description of the polyhedral Yellow Emperor Huangdi verifies the cosmological process of transformation to the "ancestor of all under Heaven" (2005: 238), while Cook states: "The rise of one's vital energy to Heaven instead of down to Earth represented a fundamental upsetting of what makes someone a human" (2006: 25). Further, the hybridization and multiplicity evident in the Chinese Mawangdui paintings and other art (Loewe 1979: 135; Barnard 1972), as well as in Egyptian literature and art, suggest the possibility of afterlife horizontal gene transfer (HGT) and viral lytic replication or cloning (King 2004). This mechanism of exponential growth operates in powers of two ($1/2$, $1/4$, $1/8$, $1/16$, $1/32$, $1/64$) and is similar to the production of cloned energy from microscopic black hole/white hole formation/evaporation processes involving the same number series equivalent to black hole resolutions (2006). Also, the Egyptian Eye of Horus is this number series (Gardner 1927), which Peirce also identifies (EP 1.271).

A Theorem Proposed Between the Two

The Egyptian, Chinese, and Peircean holographic expansion/collapse cosmological views support a realist process metaphysics based on observer-participancy for transformation backward in time related to the ascent ontological structure of consciousness rooted in the earth's gravitational field. In these similar models, perhaps the transformation references to stars, polyhedra, hybridization, multiplicity, and crystallized mind relate to viral protein folding/unfolding dynamics and native state crystallization, a process similar to microscopic wormhole dynamics, for the quantum world ruled by quantum mechanics (with its equations resembling kinetic molecular theory) orders our classical world ruled by general relativity.

In light of human genome sequencing and other research showing that lytic virus have made us what we are today while impacting the entire planet (Danovaro et al. 2008), a quantum model for a holographic expansion/collapse cosmos exhibiting wormhole dynamics is the lysis/lysogeny genetic switch of bacteriophage Lambda, a competition between cro protein and repressor protein. A simulation survey of 11 proteins including cro and repressor is a "strong indication" that binding processes

have funneled landscapes (Levy et al. 2004: 516). On the quantum level, the two entangled, competing proteins seem to express the dynamics of a micro Kerr black hole with its inner sphere (gateway to an Einstein-Rosen bridge) representing cro protein and the outer sphere representing the repressor protein. Also, the repressor protein controlling lysogeny folds in a diffusion-collision manner (Levy 2004: 516; Karplus and Weaver 1994) similar to our cosmos' diffusion-collision expansion. In contrast, cro protein controlling lysis folds and binds via the fly-casting speed-up mechanism (Levy et al. 2004; Jia et al. 2005), a process similar to a microscopic white hole casting out matter. For example, the fly-casting mechanism of cro is described as "a randomly gesticulating unfolding molecule *casting out pieces* of polymer chain, waiting for these to bind to the target", and then the whole molecule folds and reels the target in like fly fishing (Shoemaker et al. 2000: 8870). The fly-casting pattern of *casting out pieces* is not only similar to quantum mechanical Kerr black hole dynamics, but also supernova nucleosynthesis and the earth's geodynamics. Together, the genetic switch or decision circuit of these two competing viral proteins exhibit folding/unfolding dynamics and native state crystallization similar to the backward-in-time aspect of a microscopic wormhole, which is similar to the holographic expansion/collapse cosmos' of Egypt, China, Peirce, and others.

Relative to the ascent/fall ontological structure of consciousness, perhaps positioning within the earth's gravitational field selects time-reverse or spacetime, which on the quantum level, mirrors the lysis/lysogeny genetic switch of a temperate virus. Holographically, ontological Falling due to gravity is cosmic expansion, asymmetry, spacetime, lysogeny and repressor diffusion/collision folding, while ontological Ascent due to the Coriolis effect results in lawful reverses: cosmic collapse, symmetry, time-reverse, lysis and cro fly-casting mechanism. All that may be necessary to restore symmetry is a self-controlled Interpretant, acting as the cosmic unifying force or Maxwellian Demon because of the world's three active elements—chance, law, and habit-taking (EP 1.277). *Put simply, the evolution of mind depends on escaping earth's gravitational field, which may be possible due to the Coriolis effect (a law of chance), gravitational positioning as Egypt/China explain and Peirce implies (observer-participancy), and self-directed neuroplasticity or habit-taking.* Thus, what we choose to

observe today or in the future may shape the nature of the cosmos in the remote past.

The pharaonic priesthood, Chinese sages, and Peirce reinforce that mind acts as a cosmic unifying force to a primordial frozen energy state or physiosemiotic existence. Perhaps the poet Stevens is correct—the rock is “the mind/The starting point of the human and the end.”

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The designation EP followed by volume and page numbers with a period in between abbreviates the 2-volume set of *The Essential Peirce*, a selection of essays by the Peirce Edition Project. EP 1 covers the years 1867 to 1893; EP 2 covers 1893 to 1913 (Bloomington: Indiana University Press, 1992, 1998, respectively).

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