

# **The Order of the Harmonious Whole: Peirce's Guess, Peregrinus' Magnet, and Pharaoh's Path**

© 2008 Judy Kay King

Paper in press by Semiotic Society of America

## **Abstract:**

Nature may be shaping the history of human thought. In an attempt to approximately verify natural law via induction, this paper examines C. S. Peirce's Guess at the Riddle of the Sphinx, Petrus Peregrinus' scientific research on lodestone magnetization, including what Peirce terms as his "fantastic medievalism", and the pharaonic path to universality profiled in Ancient Egyptian literature. Like a Picaresque tale, Peirce's process metaphysics, Petrus' scientific imagination, and pharaonic Egypt's evolutionary biophysics of mind enforce Nature's holographic order. This implies that path-ordering, active information is historically present and continually emerging via the action of signs. Using references from Peirce, Peregrinus and Ancient Egyptian texts to Taborsky, Andrade, Casimir, Maxwell and other scientists, this semiotic approach supports that, should we understand the classical action of signs as a holographic veil of the molecular world, a lawful biophysical system for the evolution to universal mind would be accessible to human reason.

## **Short Summary for Program:**

Nature may be shaping the history of human thought. In an attempt to approximately verify natural law via induction, this paper examines C. S. Peirce's Guess at the Riddle of the Sphinx, Petrus Peregrinus' scientific research on lodestone magnetization, including what Peirce terms as his "fantastic medievalism", and the pharaonic path to universality profiled in Ancient Egyptian literature. This semiotic approach supports that, should we understand the classical action of signs as a holographic veil of the molecular world, a lawful biophysical system for the evolution to universal mind would be accessible to human reason.

Peircean Process Metaphysics

Origin of Science

Quantum and Classical Laws

Ancient Egyptian Evolutionary Biophysics

Crystallized Mind

Scientists in search of cosmic order are roaming around a Möbius trail of reversible and irreversible natural laws. Forward and backward, time-future and time-past, Newton's, Maxwell's, and Einstein's laws, including Schrodinger's quantum law, treat each direction of time equally. 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.

Many scientists believe that external reality exists independent of observation, yet quantum experiments with entangled pairs of particles are rendering local realistic theories untenable (Gröblacher

et al. 2007). Put simply, our classical world is a quantum phenomenon (Ball 2008) and a projected shadow in a quantum universe (Schlosshauer 2008: 39).

A substantial amount of evidence exists for scientific claims (Bohm, Pribram, Maldacena, 't Hooft, Susskind) that our cosmos has a holographic mode of operation with information stored at the system's boundary—not in the bulk. Also, new evidence suggests that the holographic principle can be applied to entangled states (Davies 2007: 13; Cramer and Eisert 2006), while String Theory T-Duality mathematics suggests that at Planck-length scales, the cosmos looks just the same as it does at large scales (Duff 2003: 15).

Taborsky (2001) concludes that the classical and quantum in spacetime are operating in a parallel process. Aligned with Taborsky's thought, Andrade (2002) offers his "holographic-degenerate" encoding pattern for the organization of nature. In addition, the quantum bioholography hypothesis suggests that DNA is the holographic projector of the psychophysical system. Recent experiments by Peter Gariaev et al. show the genome operates as a wave-biocomputer, and the DNA action is that of a "gene-sign" laser, reading biological texts in a manner similar to human thinking (Miller et al. 2002). Also reinforcing nature's holographic DNA organization is the recent discovery of a double-helix nebula near our galaxy's central black hole Sagittarius A\* (Morris et al. 2006).

The question is: does natural law permit evolution of mind from our imperfect continuum to a perfect continuum or the holograph itself? In an attempt to *approximately* verify natural law via induction, this paper examines Peirce's Guess at the Riddle of the Sphinx, Petrus Peregrinus' scientific research on lodestone magnetization, including what Peirce terms as his "fantastic medievalism", and the pharaonic path to universality profiled in the least corrupted Ancient Egyptian texts.

## **1. An Old Order**

Peirce's guess is that chance, law and habit-taking are active in the world. (EP 1.277) "Mind is First, Matter is Second, Evolution is Third." (EP 1.297) Mind as matter is not completely dead, for it still possesses the potential for diversification or life (EP 1.331), the potential for the action of change which is the sign of chance-spontaneity (EP 1.349). The law of mind is a harmonious "living idea, a conscious continuum of feeling," a "celestial and living" unification (EP 1.330). In the evolution of mind, Peirce emphasizes that "pure chance survives and will remain until the world becomes an absolutely perfect, rational, and symmetrical system, in which mind is at last crystallized" (EP 1.297). Peirce said that man "should become welded into the universal continuum", for in fulfilling this command "man prepares himself for a transmutation into a new form of life," (CP 1.673) what suggests a higher-ordered morphogenesis.

In contrast to the evolution of mind, Peirce explains that the human species will be exterminated, and the universe will be well rid of it (EP 2.60). He also compares our actual world to a polyp (EP 1.176), a tumor. He states that "God probably has no consciousness." (EP 2.447) Also, "Thought is not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the purely physical world;" (CP 4.551).

To Peirce, unveiling a general characteristic of the cosmos or a universal law is essential (EP 1.171). Natural law or truth expresses itself "in a cosmos and in intellects which reflect it," (EP 2.58). According to Peirce's *holographic* view, "every single truth of science is due to the affinity of the human soul to the soul of the universe," (EP 2.152). Conformity to law is imperfect, so "pure spontaneity" intermingles with law everywhere (EP 1.276). For example, the second law of thermodynamics is probabilistic, that is, it is a statistical result of chance due to numerous molecules having frequent encounters. Entropy usually increases, but a probability exists that entropy decreases, for "chance may and will have the opposite influence." (EP 1.221) Peirce said: "the whole universe of true and real possibilities forms a continuum upon which the Universe of Actual Existence is but an element of discontinuity," (Eisele 1979: 257).

Peirce explains that an "*imperfect continuum*" possesses "*topical singularities*, or places of lower dimensionality" which break continuity, while "the parts of a perfect continuum have the same

dimensionality as the whole.” (CP 4.642) Circular continua without singularities are time and space. (CP 6.210-212) By using math as his lens, Peirce envisioned singularities or lower dimensional holes in the imperfect cosmologic continuum, while maintaining that a probabilistic law of chance exists that entropy decreases.

Because the nonlinear algebraic equations of Cayley, Klein, Clifford and Riemann (Eisele 1979: 242, 256) relating to vector spaces influenced Peirce’s mathematical thought which inspired his philosophy, he supported the theory of negative space curvature (1979: 69), the dwelling place of black holes. In his fourth Harvard lecture (April 16, 1903), Peirce uses a circle and two spirals to illustrate the influence between matter and mind relative to the direction of time’s flow. Within the circle are clockwise operations of logical thought, while those exterior represent counterclockwise “operations of matter under mechanical laws.” (EP 2.185-186) Comparatively, the topology of Peirce’s spiral with its inner horizon of mind and outer horizon of matter mirrors Teilhard de Chardin’s biophysical conception of cosmo-psycho genesis, which the Jesuit paleontologist depicts by an inner cone of evolving, rising mind versus an outer cone of decomposing matter expressing microscopic Kerr black hole dynamics (King 2007b). Peirce then proposes his “wild hypothesis” that atoms are vortices *ad infinitum* through which energy can be transformed in a fraction of a second (EP 2.185-186), an idea identical to physicist Juan Maldacena’s holographic view. Maldacena (2004) explains, “Space-times with negative curvature effectively have a boundary at infinity. A particle can go to infinity and back in finite time, this is possible only because time flows differently at different positions, as we go far away time flows faster.”

Maldacena conjectured that the whole gravitational physics in this negative curvature space can be described by a theory of ordinary particles on the boundary. Peirce too was aware of this idea of limit, as shown in his letter to Newcomb dated December 12, 1890. He defines *limit* as “the precise boundary between two continuous regions of magnitude or quantity”, and more specifically as a “potential aggregate” containing “general conditions which *permit* the determination of individuals.” (NEM 1976:

106) Peirce's ideas are remarkably similar to the holographic principle and Maldacena's area theorem for black holes.

Also, Peirce often describes a twist in space, which he explains in his manuscript 'The Logic of Continuity'. To philosophically explain continuity, Peirce uses geometry, describing a bounded "perissid" surface using a half-twisted ribbon pasted together similar to a Möbius surface. Similarly, Hamilton and Lisle's mathematically sound river model (2008) explains how space flows inside a rotating Kerr black hole solution. The river of space does not spiral inward, for it has a velocity and a twist related to space and time axes characterized by natural Clifford geometry. In the vacuum Kerr solution, the river velocity goes to zero at the horizontal disc bounded by the ring singularity, then turns around and rebounds through a white hole into a new universe. (2008) This same scenario is explained by Egyptian texts relative to the six Eye of Horus numbers ( $1/2-1/4-1/8-1/16-1/32-1/64$ ) related to Clifford geometry (King 2004; 2006).

The Kerr black hole is a gateway to an Einstein-Rosen bridge or wormhole through its inner horizon. Floyd Merrell (2002) observed that Peirce explains a wormhole by his thought experiment of punching holes in paper sheets representative of other universes. Similarly, in the 'Logic of Continuity', Peirce uses the metaphor of two caves and four balloons to demonstrate movement through a wormhole that allows a flow of cold to hot and a movement of time from present to past, a violation of the second law of thermodynamics. First, he describes the surface of a double ring, then envisions a pungent, pitch-black, cold, closed cave bounded on all sides "that you can swim about in the air regardless of gravity." This cave with its two great, stationary balloons connects to a different textured, "rather warm", perfumed cave of the past. Against the flow of time, one can "swim" into the unbounded warm cave from the present cold cave and experience a "queer twist" via a balloon wall that reduces to a film. These ideas are further complicated with higher dimensionality. (NEM 1976: 110-111) Nonetheless, his balloons suggest shells of cooler and warmer particles, while his films indicate horizons. The net effect is an energy flow from cold to hot, catalyzing a classical violation of the second kind. Peirce also describes

plural or synthetic consciousness, viz., nonlocality, as “being aware of the bridge which unites the present and the absent, of a Process as such.” This “collects present and absent into a whole.” (EP 1.283)

Peirce mentions that a person needs “a rigidly exact logic of relations” as a guide in a field of emergent dimensions (NEM 1976: 111). Similarly, Ancient Egyptian texts resonate with explicit irreversible instructions, the same language of hot and cold caverns, identical odors, and “swimming”, as well as imagery and text describing a micro Einstein-Rosen bridge that violates time evolution and the second law of thermodynamics (King 2004; 2006). Current research on microscopic black holes also implies violation of the second law of thermodynamics, allowing the construction of a *perpetuum mobile* of the second kind (Dubovsky and Sibiryakov 2006; Jacobson and Wall 2008).

## 2. Essential Unity

Petrus Peregrinus, an elder contemporary of Roger Bacon, wrote a treatise on his scientific experimentation with the lodestone (magnetite), a natural magnet that attracts and magnetizes iron. Peirce planned to write an edition of the treatise, for he believed that it was the earliest work of experimental science dated August, 1269. In a letter to his brother James, Peirce discusses Petrus’ experiments:

He fancied that the poles of the magnet turned to the poles of the heavens, and he fancied that if a lodestone was mounted on an axis parallel to the axis of the heavens, and were perfectly balanced, it would turn round with the diurnal motion of the heavens. Here he ceases to be an experimentalist, and slides into fantastic medievalism. (HP 1.48)

To Petrus, the poles of the natural lodestone received its “virtue” from the poles of the heavens, and the “whole stone” also received its “virtue” from the “whole heavens”. This holographic view mirrors the view of Peirce, who sees a disordered order in nature, even though he cannot see a “precise system” of arrangement in the stars (EP 1.172). Remarkably, modern scientists are confirming Petrus’ “fantastic medievalism” or belief in a heavenly axis. Michael Longo (2007) at the University of Michigan sampled 1660 spiral galaxies around the so-called cosmic Axis of Evil, suggesting that a large-scale magnetic field

exists and “implying that the universe has a handedness”. The probability that this ordered alignment occurred by chance was estimated to be  $<0.4\%$ . Scientists are especially puzzled by alignments of this cosmic axis with our solar system (Huterer 2006). Yet, the medieval scientist Petrus was aware of this cosmic axis.

In the same letter to James, Peirce mentions Petrus’ invention of a “motus perpetua.” To construct a continually moving wheel, Petrus said to prepare a hollow silver case “like the case of a mirror” with small teeth of iron spaced apart by the “thickness of a pea” and fixed to the edge. The lodestone is then attached to a small silver bar on a central axis in the confining geometry of the case. (HP 1.110-112) A moving permanent magnet such as the lodestone can produce an electric field which can move charges in a closed circuit. If iron is brought near to a lodestone, the electrons within the iron atoms orient their spins to match the lodestone’s magnetic field force, becoming magnetized. By positioning the iron teeth with small gaps between each, Petrus’ wheel would operate by a cyclic flipping action of magnetic domains. When ferromagnetism collapsed at the small gap, the iron tooth would cool. A pulsating current would flow through each iron tooth in an ongoing cycle of heating and cooling drawing energy from the vacuum, while violating the second law of thermodynamics.

Petrus’ ferromagnetic experiment is also a good witness to macroscopic entanglement, the quantum to classical phase transition from a nonmagnetic disordered state to a magnetic ordered state, which modern scientists are currently quantifying (Vedral 2008). Further, Petrus’ experiment brings to mind Hendrik Casimir’s proposal that two metal plates or mirrors placed a few micrometres apart should attract each other, even in a vacuum. The Casimir force is due to fluctuating electromagnetic waves in a quantum vacuum having a latent energy content. Since electromagnetic waves fluctuate in any vacuum, the Casimir force illustrates that the vacuum is not empty. Virtual particles exist. (Balibar 2008) The Casimir force produces negative curvature of spacetime by creating a negative energy density, exactly what is necessary to keep a wormhole open. The force can be attractive or repulsive depending on the nature of the boundary.

Petrus also discusses how iron continues in the air via the lodestone's virtue in the "book on the action of Mirrors." (HP 1.110) Roger Bacon, Petrus' contemporary, developed a theory of the multiplication of *species* or successive generation of light (1240?) similar to Peirce's vortices *ad infinitum* of emergent dimensions. According to Lindberg (1997: 249), Bacon believes "a species is elicited in the recipient out of potentiality that already exists there." Bacon had access to the works of Avicenna (d. ca. 1058), who describes a force (*vis*), ray (*radius*), or likeness (*species*) emanating from a "First Maker" (1997: 245). Citing his translations of Bacon's *Perspectiva* (1996) and *De multiplicatione specierum* (1983), Lindberg describes Bacon's production of the *species* of light "in the first part of the air" contiguous to the second part and so on, the generation multiplying "according to the dimensions of the air;" along with Bacon's argument that this generation can occur along straight, reflected, refracted, twisting, and accidental lines (1997: 250), reminiscent of Peirce's twist and the twisting spacetime axes of modern Kerr black hole research. In *Perspectiva*, Bacon explains that the "twisting path" for transmission of the *species* occurs "by the power of the soul" (1266?; Lindberg 1997: 255). Lindberg also discusses Bacon's ideas on the incidence of the stronger perpendicular passage of a *species* on a transparent interface versus the easier oblique passage, as well as the images produced by the reflection and refraction of light on a mirror surface (252-255). These explanations support Kerr black hole dynamics relative to the inner axial horizon acting like a holographic mirror.

### **3. Connoisseurs of Chaos**

In a recent transdisciplinary study (King 2004), eight major Egyptian texts spanning 2000 years were reviewed. The holistic approach to sign interpretation included analyses of hieroglyphs, ritual, architecture, the etymology of words, textual descriptions with related artwork in noted English translations, and artwork and hieroglyphs in pyramids and coffins. Reviews of the least corrupted Old Kingdom *Pyramid Texts* produced 108 mythic idea strands that were also present in the Middle Kingdom *Coffin Texts*, showing conceptual unity over 900 years. These 108 idea strands were then fused into 30 key themes and tested again for unity and coherence in six additional Middle and New Kingdom texts

(*Amduat, Book of Gates, Book of Two Ways, Edifice of Taharqa, Book of the Dead and Theban Recension*). Within this consistent model, the value or meaning of each sign emerged, not by choice, but rather from an analysis of each sign's interaction within a matrix of 870 interlinked thematic signs. Unpredictably, Egyptian concepts mirrored modern scientific thought, and a science equivalent to modern science emerged.

Using Peircean logic on ancient documents, this paper is part of a continuing inductive argument (King 2005; 2006; 2007; 2007a; 2007b; 2008), testing predictions based on the thesis that the semiotic phenomenology of the pharaonic priesthood harbors an eschatological survival message for humans, viz., horizontal gene transfer (HGT) mediated by the complex bacteriophage Lambda. First, numerous textual analyses resulted in the abduction that Egyptian deities represent viral and bacterial proteins. Second, the activities of the deities or proteins (the union of the deceased king and the Sun-god, the dying/rising god Osiris, the brother rivalry between Seth and Horus, Isis' virgin birth of the Horus child, and so on) model HGT and phage Lambda's complex lifestyles. Third, Lambda's lifestyles mirror most religious and mythic themes. Fourth, human genome research proves that viruses and bacteria have made us what we are today, and HGT is possible with our cell-type, suggesting that HGT may be possible at human death because DNA degrades into tiny fragments that can survive and be transported by a gene vector such as the very abundant phage Lambda. Fifth, space physics and microbiology research reinforces that earth and its magnetosphere operate like a bacterial cell. The holographic pharaonic perspective is that what is above is what is below; our classical cosmos emerges from the quantum formalism. Sixth, research shows that in the Lambda lifestyle of lysis, the protein activity along the bacterial cell DNA wormhole operates like a microscopic Einstein-Rosen bridge. This pansemiotic model supports Peirce's view that semiosis is everywhere in the universe, as well as his guess related to the chance for diversification, the evolution or "transmutation into a new form of life", and the crystallization of mind, as well as his non-Euclidean view of a wormhole that violates the second law. It is also in good accord with Bacon's multiplication of the light *species*.

After a human death, bacteria degrade the body, but DNA degrades into tiny fragments that can survive in fragmented form for HGT by a gene vector such as phage Lambda, a virus attacking bacteria. In the Egyptian afterlife, the semiotic agent is the deceased king, who interprets signs on earth and in the cosmos that are mirrored holographically in the quantum molecular world. The signs point to a specific route to chemiluminescence rather than photosynthesis, the two competing chemical reactions existing in our cosmos. On the quantum level, the signs describe the switching mechanism of phage Lambda, as it moves from its lysogenic lifestyle controlled by cI protein to its lytic lifestyle controlled by cro protein. By means of his interpretative acts, the deceased king merges with the Sun-god or UV light at the northern polar cusp of the earth or gap in the magnetosphere, where spacecraft spectroscopic instruments have measured good elemental abundance for carbon, oxygen, neon, magnesium, silicon, sulfur, and iron. This element-enriched polar cusp or gap in the earth's magnetosphere corresponds to the cell pole or gap between the cytoplasm and cell wall, a protein enrichment site where polar localization of proteins is critical for cellular process such as division, chromosome partitioning, and cell cycle control in bacteria. The Sun-god can be interpreted as the sign for phage Lambda, a gene vector for the deceased king's HGT, and this union at the polar region results in a self-assembled complex of viral proteins invading the rotating earth-cell to become a codemaking, transcribing complex of proteins that switch genes on for the lytic pathway and switch genes off for the lysogenic lifestyle along the cellular chromosome. The dying/rising deity Osiris, decoded as the sign for the Lambda prophage, then rises via a Holliday junction or site-specific recombination process where DNA bends into a cross. As Egyptian signs support, research confirms that the RNA polymerase complex plows straight through the DNA double helix instead of rotating around the DNA (Liu and Wang 1987).

Now, Balbin and Andrade (2004) propose a theoretical model where protein folding and evolution are driven by the Maxwell Demon activity of proteins. This is exactly the case in Ancient Egyptian texts, for the pharaonic crystallization process revolves around Lambda cro protein (god Horus) and lactose metabolism (goddess Isis), which controls the lytic lifestyle and activates transcription through the DNA wormhole, a mirror of a micro Einstein Rosen bridge violating the second law. As renowned Egyptologist

Erik Hornung observed, the Egyptian netherworld can be defined as a black hole and “the location of time past” while “Time reversal permits us to leave the Black Hole,” (1994: 154). As mind or energy, the pharaonic priesthood aspired to escape the earth system into the greater cosmos at death.

#### **4. A Law of Inherent Opposites**

So in light of Ancient Egypt, is there any biophysical evidence of HGT, cloning, or a micro Einstein-Rosen bridge in what Baudrillard called ‘history’s dustbin’? The answer is yes—a recurring semiotics of evolvability exists. Research shows that royal incest, religious and mythic themes, Durer’s *Melancholia I*, Artaud’s writings, the Christian phenomenon of sinful sex, early and modern Christian ritual, Charcot’s hysterical shows, sexual perversions, and modern science support a biosemiotics of HGT and/or cloning. As an example, early and modern Christian ritual (Epistle, Gospel, Christ’s entrance, multiplication of bread), a mirror of ancient Egyptian ritual carved on the walls of Pharaoh Taharqa’s (690-664 BCE) Edifice, can be translated into a biosemiotics of gene-directed cell processes reinforcing the viral lytic pathway of phage Lambda (King 2008), supporting Ji’s theory (1997) that rudimentary language is derived from cell language. Research also shows that the Aztecs, the books Revelation and Ezekial, Blake’s *Four Zoas*, Teilhard de Chardin’s biophysics, the topology of the Dead Sea Temple Scroll, the topology of Hagia Sophia’s architecture, and modern science support wormhole dynamics. This active recurring information for survival of mind is everywhere in history’s dustbin, but humanity is oblivious.

Pharaonic Egypt’s holographic perceptions parallel the perspectives of Peirce, Petrus and Bacon, while weaving their ideas into an intelligible whole. Both Peirce and pharaonic Egypt closely link physics with biology, as does Roger Bacon and Teilhard de Chardin, whose evolutionary thought mirrors Peirce’s (King 2007b). In the ‘Logic of Continuity’, Peirce states that if a mind “is capable of being drawn by any means within an alien sphere of attraction,” then his study will accomplish this objective (CP 6.213). Egyptian texts support that the “alien” is phage Lambda, and they model their core myth on the virus’ lifestyles. This universal core myth of the dying/rising god on the cross, the brother rivalry, and virgin

birth suggests that humans may be grounding their idea of god on the lifestyles of phage Lambda, a possible genetic memory of our microbial DNA heritage, stressing HGT for evolution of mind at death.

Although the language of religion and science seem different, both are talking about the central order of nature relative to DNA and information, as is Peirce, Petrus, Bacon, and pharaonic Egypt. This path-ordering, active information suggests that the central pattern or law of our holographic cosmos may be modeled on the biophysical battleground of gene regulation in bacteriophage Lambda, one of nature's most efficient and highly evolved mechanisms identified by experimental praxis. Egyptian texts support that the Lambda lifestyles of lysogeny and lysis can be understood as two paths to two living systems, photosynthesis and its reversal chemiluminescence, the cosmic key for evolution of mind and continuity. The texts support that the Lambda genome is the world-heart of two ways. The viral lifestyle of lysogeny controlled by cI protein results in matter, classical spacetime, our world of projected shadow, photosynthesis, sexual genesis or vertical gene transfer, mind in the human body, and the imperfect continuum. In contrast, the viral lifestyle of lysis controlled by cro protein and lactose metabolism results in transformation to energy, the quantum, chemiluminescence, asexual genesis or HGT, mind in the cosmos, and the perfect continuum. Some scientists believe our cosmos is entangled with another (Chown 2007). On the holographic quantum level, perhaps this is just the competitive entanglement of cI and cro proteins cycling in perpetual motion—an inherent law of nature elucidating the assembly of things.

In light of modern experiments, physicist John Wheeler (1988) speculated that the act of conscious observation functions with quantum mechanics, catalyzing a probability or outcome. So, if an observing consciousness has knowledge of the classical path and its magnetic field orientation, an act of measurement or choice might entangle space to reify the holographic quantum paths to a perfect continuum. Peirce guesses that to be drawn into a new system, a particle must have the right mass, the right velocity in the right direction, the right attraction, and it must present itself at the right point (EP 1. 270). Similarly, a finite probability exists for any particle that approaches the black hole event horizon to bounce back, dependent on the incoming particle's energy, its charge, and its projection of the orbital

momentum on the axis of rotation of the black hole (Kuchiev 2003; 2004; 2004a), the same conditions in Egyptian texts (King 2004; 2006).

Only an approximate conclusion remains: chance may be knowledge of the cosmos' holographic mode of operation and magnetic fields; habit breaking may result in the transformation of energy by a violation of the second kind; and evolution of mind or energy might be possible through HGT via a cosmic viral code of Lambda-genesis. "Order is simply thought embodied in arrangement;" (CP 6.490). Accordingly, the original meaning of the signs may relate to a viral biophysics of crystallized mind for human evolution via a natural chemical pathway to a perfect continuum. Again, this semiotics of evolvability and order recurs in time with the chaotic dream of reason that projects a pervasive falsification of our perceptual world. As Wallace Stevens envisions in "Connoisseur of Chaos", perhaps "the pensive man may see."

#### REFERENCES, Historically Layered

ANDRADE, Eugenio.

2002. "The organization of nature: semiotic agents as intermediaries between digital and analog information spaces", *SEED Journal* 1, 56-84.

BACON, Roger.

- 1240? *De multiplicatione specierum*, ed. and trans. David C. Lindberg, *Roger Bacon's Philosophy of Nature: a critical edition, with English translation, introduction, and notes* (Oxford: Clarendon Press 1983), quoted in Lindberg 1997.
- 1266? *Perspectiva*, ed. and trans. David C. Lindberg, *Roger Bacon and the Origins of Perspectiva in the Middle Ages* (Oxford: Clarendon Press 1996), quoted in Lindberg 1997.

BALBIN, Alejandro, and Eugenio ANDRADE.

2004. "Protein folding and evolution are driven by the Maxwell Demon activity of proteins", *Acta Biotheoretica* 52(3), 173-200(28).

BALIBAR, Sébastien.

2008. "The force of fluctuations", *Nature* (January 10) 451(7175), 136-137.

BALL, Philip.

2008. "Quantum all the way", *Nature* (May 1) 453(7191), 22-25.

CHOWN, Marcus.

2007. "The void: imprint of another universe?" *New Scientist* (November 24) 2631, 34-37.

CRAMER, M. and J. EISERT.

2006. "Correlations, spectral gap and entanglement in harmonic quantum systems on generic lattices", *New Journal of Physics* 8, 71. <<http://www.njp.org/>>

- DAVIES, Paul C. W.  
2007. "The implications of a cosmological information bound for complexity, quantum information and the nature of physical law", 1-15. <[arXiv:quant-ph/0703041v1](https://arxiv.org/abs/quant-ph/0703041v1)>
- DUBOVSKY, S. L. and S. M. SIBIRYAKOV.  
2006. "Spontaneous breaking of Lorentz invariance, black holes and perpetual mobile of the 2nd kind", *Phys. Lett.* B638, 509-514. <[arXiv:hep-th/0603158v2](https://arxiv.org/abs/hep-th/0603158v2)>
- DUFF, Michael J.  
2003. "The theory formerly known as Strings", *Scientific American Special Edition* 13(1), 12-17.
- EISELE, Carolyn.  
1979. *Studies in the Scientific and Mathematical Philosophy of Charles. S. Peirce* (The Hague: Mouton Publishers).
- GRÖBLACHER, Simon, Tomasz PATEREK, Rainer KALTENBAEK, Časlav BRUKNER, Marek ŽUKOWSKI, Markus ASPELMEYER, and Anton ZEILINGER.  
2007. "An experimental test of non-local realism", *Nature* (April 19) 446 (7138), 871-875.
- HAMILTON, Andrew J. S. and Jason P. LISLE.  
2008. "The river model of black holes", *American Journal of Physics*, 76, 519-532.  
<[arXiv:gr-qc/0411060v2](https://arxiv.org/abs/gr-qc/0411060v2)>
- HORNUNG, Erik.  
1994. "Black holes viewed from within: Hell in ancient Egyptian thought", *Diogenes* 165, 133-156.
- HUTERER, Dragan.  
2006. "Mysteries on universe's largest observable scales", *New Astron. Rev.* 50, 868-874.
- JACOBSON, Ted, and Aron C. WALL.  
2008. "Black hole thermodynamics and Lorentz symmetry", <<http://arxiv.org/abs/0804.2720>>
- JI, Sungchul.  
1997. "Isomorphism between cell and human languages: molecular biological, bioinorganic and linguistic implications", *Biosystems* 44(1), 17-39.
- KING, Judy Kay.  
2004. *The Isis Thesis* (Gaylord, MI: Envision Editions, Ltd.)  
2005. "Biosemiotics in ancient Egyptian texts: the key to long-lost signs found in myth, religion, psychology, art, and literature", *International J. Humanities* 3(7), 189-203.  
2006. "Biosemiotics in ancient Egyptian texts: the key unlocking the universal secret of sexuality and the birth of the limitless", paper presentation on October 25, 2006 to the Second International Congress for Young Egyptologists, Lisbon, Portugal, in Congress press.  
2007. "Man the misInterpretant: will he discover the universal secret of sexuality encoded within him?" *International J. Humanities* 4(9), 1-15.  
2007a. "From history's dustbin: a semiotics of evolvability discovered within man and his mountain of transformation", *International J. Humanities* 5(5), 113-126.  
2007b. "Self-portrait in the pharaoh's mirror: a reflection of ancient Egyptian knowledge in Teilhard de Chardin's evolutionary biophysics", paper presentation at 32<sup>nd</sup> Annual Meeting of Semiotic Society of America, in SSA press.  
2008. "Cosmic semiophysics in ancient architectural vision: the mountain temples at *Deir el Bahari*, the Dead Sea Temple Scroll, and the Hagia Sophia", *International J. Humanities* 6(4), 17-26.

KUCHIEV, M. Yu.

- 2003. “Reflection from black holes”, (October 2), <[arXiv:gr-qc/0310008v1](https://arxiv.org/abs/gr-qc/0310008v1)>
- 2004. “Reflection, radiation and interference for black holes”, *Phys. Rev. D* 69, 124031.
- 2004a. “Reflection from black holes and spacetime topology”, *Europhys. Lett.* 65, 445-451

LINDBERG, David C.

- 1997. “Roger Bacon on light, vision, and the universal emanation of force”, in *Roger Bacon and the Sciences Commemorative Essays*, ed. Jeremiah Hackett (Leiden: Brill), 243-275.

LIU, L. F., and J. C. WANG.

- 1987. “Supercoiling of the DNA template during transcription”, *Proc. Natl. Acad. Sci USA* 84(20), 7024-7027.

LONGO, Michael J.

- 2007. “Evidence for a preferred handedness of spiral galaxies”, (Submitted on 25 Jul 2007). Available at: <<http://arxiv.org/ftp/arxiv/papers/0707/0707.3793.pdf>>

MALDACENA, Juan.

- 2004. “Black holes and the structure of spacetime”, aired October 2, 2004: online lecture. Perimeter Institute for Theoretical Physics. <<http://www.sns.ias.edu/~malda/PublicLectures.htm>> Accessed November 12, 2007.

MERRELL, Floyd.

- 2002. “Abducting the process of abducting: an impossible dream?” <<http://user.uni-frankfurt.de/~wirth/texte/merell.htm>> Accessed August 30, 2008.

MILLER, Richard A., Iona MILLER, and Burt WEBB.

- 2002. “Quantum biology: a review of the field from 1973 – 2002”, *Journal of Non-Locality and Remote Mental Interactions*, 1(3). <<http://www.emergentmind.org/MillerWebb13a.htm>> Accessed September 23, 2008.

MORRIS, Mark, Keven UCHIDA, and Tuan DO.

- 2006. “A magnetic torsional wave near the Galactic Centre traced by a 'double helix' nebula”, *Nature* (March 16) 440(7082), 308-310.

PEIRCE, Charles Sanders. (10 September 1839-1914 April 19).

*Note:* The designation **CP** abbreviates *The Collected Papers of Charles Sanders Peirce*, Vols. I-VI ed. Charles Hartshorne and Paul Weiss (Cambridge, MA: Harvard University Press, 1931-1935). The abbreviation followed by volume and paragraph numbers with a period between follows the standard CP reference form.

The designation **EP** abbreviates *The Essential Peirce*, Vols. 1-2, general ed. Nathan Houser (Bloomington: Indiana University Press, 1992, 1998 respectively). The abbreviation followed by volume and page numbers with a period in between follows the standard EP reference form, with EP 1 covering 1867-1893, and EP 2 covering 1893-1913.

The designation **HP** abbreviates *Historical Perspectives on Peirce's Logic of Science. A History of Science*. ed. Carolyn Eisele (Berlin: Mouton Publishers, 1985), two volumes.

The designation **NEM** abbreviates *The New Elements of Mathematics*, ed. Carolyn Eisele (The Hague: Mouton, 1976), Vol. III/1 Mathematical Miscellanea.

PEREGRINUS, Petrus.

1269. Epistle of Petrus Peregrinus on the Lodestone, in *Historical Perspectives on Peirce's Logic of Science*. ed. Carolyn Eisele (Berlin: Mouton Publishers, 1985), vol. 1, 96-112.

SCHLOSSHAUER, Maximilian.

2008. "Lifting the fog from the north", *Nature* (May 1) 453(7191), 39.

STEVENS, Wallace.

- 1982 *Wallace Stevens the collected poems*. "Connoisseur of Chaos" (New York: Vintage Books).  
Subheadings and poetic quotations in this paper are from this poem.

TABORSKY, Edwina.

2001. "Energy transformation and semiosis. CASYS Conference, Liege, Belgium  
<<http://www.digitalpeirce.fee.unicamp.br/taborsky/p-enetab.htm>> Accessed January 12, 2007.

VEDRAL, Vlatko.

2008. "Quantifying entanglement in macroscopic systems" *Nature* (June 19, 2008) 453, 1004-1007.

WHEELER, John Archibald.

1988. "World as system self-synthesized by quantum networking" *IBM J. Res. Develop.*  
32(1), 4-15.