

The Convulsive Beauty of Cosmic Being: Where Science, Spirituality, and Poetry Collide

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Abstract

Gerard Manley Hopkins saw intense spiritual connections with nature and was able to integrate these connections into his work. Modernist poets were fascinated by, and often times appalled by, quantum theories about the building blocks of the universe. Their main goal was to create poetry that was grounded, present, and unadulterated by imprecise romantic notions. In distilling language down to its smallest units of meaning, either particulate images or wave-like structures devoid of subjects and objects, Modernists discovered that the objective correlative could only be achieved with a mixture of both forms (Albright, 1997). Contemporary poet Andrew Joron shares the multidimensional view of the Modernists and the intense spiritual connections of Hopkins, and describes such transitional awakenings as a “convulsive beauty of cosmic being” (Joron, 2008). This article explores the ways poets have used science and nature to infuse energy into their work.

Keywords: poetry, quantum physics, quantum poetics, science, spirituality

Quantum physics with its vague and fuzzy view of the subatomic world has brought the cold determinism of science closer to the abstract indeterminism of poetry. Poets of today have a broad palate from which to effectively and evocatively integrate scientific concepts and language into their writing.

One of our earliest records of atomic theory comes from ancient Latin poetry. In ca 55 BCE the epic poem, *On the Nature of Things*, by Roman poet Titus Lucretius Carus was published (Lucretius, 2001). Written in dactylic hexameter, the six-book poem is a passionate devotional to the teachings of the Greek philosopher Epicurus (341 to 270 BCE), who theorized that the physical realm of Earth is composed of matter and void. Epicurus’s philosophy of matter was born from the atomic theory of Democritus (440 BCE), and evolved as a means to show his fellow Greeks that humanity should not fear death, because we are made of stuff that existed long before we were born and that same stuff will exist long after we die. Matter (which even includes the mind and spirit), according to Epicurus, is composed of indivisible, indestructible, and unseen units of like material, varying only in shape, size, and weight. These “primary elements” collide with each other to form compounds (or “objects”) that comprise the solid forms that are visible to the human eye. Humans and all living creatures are composed of different compounds, which are malleable and can be degraded back into primary elements. Epicurus thus reasoned that when we

die our primary elements, including those that comprise our spirit and our mind, will return to the void.

Lucretius's decision to convey Epicurean atomic theory using poetic language has been echoed by atomic physicists of the modern age. Niels Bohr expressed that the minute scale and associated activities of quantum particles can only be described using metaphors: "When it comes to atoms, language can only be used as in poetry. The poet, too, is not nearly so concerned with describing facts as with creating images" (Primack and Abrams, 2006; Tolstoy, 1990). Convincing poets to foray into the world of science, however, is no easy task. In his article, *Quantum Poetics*, Nick Laird discusses the difficulty of expressing science in poetry (Laird, 2008). So much of poetry centers on humanity and our relationships with nature that the cold calculus of science feels arid and remote to most poets. Poetry is evocative and revelatory and accomplishes these ends through imagery. New images offered by electron micrographs, telescopes and satellites, and radiographic imaging provide fresh fodder for the poet to explore.

With new technological advances comes greater and often exponential understanding of the universe. Primack and Abrams explain that the constituents of the universe behave differently at different size scales (Primack and Abrams, 2006). As an example, they point out that there is no such thing as a molecule of ice. A molecule of water is not fluid or solid or gaseous until it combines with other molecules into larger collections. The physical properties of water as we know them do not begin to exist until a much larger size scale is reached. Even microorganisms have adapted to living in a watery environment as if they were living in thick molasses or soft earth. The flagella and bodies of spirilla drill through the water. The further we move out from our size scale, the more unified we become with the universe. We cease to be ourselves. At the subatomic level, every electron is the same.

Plato stated that only ideas were reality and that physical matter was a mere imperfect copy of a perfect idea (Primack and Abrams, 2006). Quantum physicists have discovered that at the subatomic level matter behaves as a perfect mathematical probability. At the subatomic level, matter and geometry are one in the same. This concept is wonderfully illustrated through our genesis of understanding how light behaves. Isaac Newton in the latter part of the 17th century, determined that light behaved as a particle (or corpuscle) traveling in a straight line (Lederman and Hill, 2011). Newton's particle theory of light worked well in demonstrating the absorptive and reflective properties of light. However, in 1807 the English physician, Thomas Young, determined that light behaved as a wave. Young demonstrated the diffractive quality of light by shining a light on a plate with two thin slits and observing the dark and light patterns on a screen positioned behind the plate opposite the light source. Young noted that the light when passing through the narrow slits spread out from the focal point of the slits as waves do when a stone is dropped in water. In 1926, the work of Werner Heisenberg, Erwin Schrödinger, and Max Born showed that light has properties of both particles and waves. The wave characteristic of light is the probability pattern for the location of the particle (i.e., an electron) at a particular moment in time.

Shifting our focus to the galactic level, we see that our notions of classical Newtonian physics break down with the discoveries of dark matter and dark energy (Primack and Abrams, 2006). Dark matter is composed of large transparent subatomic particles that fill the interstices of spiral galaxies and is the reason why galaxies remain intact. All of the stars within a galaxy rotate at the same velocity around the center of the galaxy, which is different from planetary orbits. Planets rotate at ever increasing orbital velocities the closer the planet is to its star. Newtonian physics predicts that planets remain in orbit because they do not exceed the velocity needed to leave their orbit (i.e., they do not reach the escape velocity needed to break free from the star's

gravity). According to Newtonian physics, the stars at the outer edges of a spiral galaxy should not be held in place by gravity because their speeds exceed the escape velocity of the gravitational pull of the black hole at the center of a galaxy. (A black hole is a gravity well created when the mass of an object, usually a star, becomes so dense that the associated gravity causes the object to collapse in on itself.) The gravity imposed by dark matter keeps the stars at the edges of the galaxy from escaping. Conversely, the repulsive force known as dark energy causes space to push away from space, and was created along with dark matter at the time of the Big Bang. The amount of dark matter far exceeded the amount of dark energy at the birth of our universe. Dark energy grows stronger as it expands. Ever since the Big Bang, dark energy has continued to expand with accelerating repulsive force, and is now the predominant component of the universe. The amount of dark matter, however, is the same as it was immediately after the Big Bang.

In early 20th century, William Carlos Williams' called for poets to acknowledge the quantum, nonclassical, ideas of space, time, and reality in their work, or else poetry will become outmoded and forgotten (Duhaime, 2011). Quantum physics introduced the world to the malleability of time and space, characteristics of reality previously regarded as fixed and rigid. Quantum concepts of reality have permeated popular culture and poetry mirrors the mores of the times. Twentieth century poets began using fluid metrics rather than fixed metrics in their poetry in response to the indeterminate nature of quantum physics. Williams went so far as to introduce his own metrical foot called the variable foot, which requires the reader to read lines of variable syllable length at the same speed for each line. As Douglas Duhaime explains, “[r]eading a poem in this manner, one must stretch out or lengthen the pronunciation of certain words while foreshortening or contracting the pronunciation of other words. Like in Einstein's special relativity, where rockets and planets stretch and shrink as they move through space-time, in variable foot poetics, words stretch and shrink as they move through the poem” (Duhaime, 2011). Instead of using Williams' variable foot, Charles Olson expressed space-time relationships in his poetry by use of white space before and after words within a line (Duhaime, 2011). The combination of text and white space in one line is relative to the combination used in adjacent lines. Indention and spacing are common devices used in poetry and are more readily consumed by the reader than needing the foreknowledge of reading a poem as a variable foot.

Quantum poetics, according to Daniel Albright, is not poetry about quantum physics, but poetry that metaphorically appropriates the fundamental concepts of quantum physics, particles and waves (Albright, 1997). Modernist poets were fascinated by, and often times appalled by, quantum theories about the building blocks of the universe. Their main goal was to create poetry that was grounded, present, and unadulterated by imprecise romantic notions. In distilling language down to its smallest units of meaning, either particulate symbols, images, words, or glyphs or wave-like structures devoid of subjects and objects (a flow of indeterminate referents) and then constructing poems from only particle or wave forms, Modernists discovered that the objective correlative could only be achieved with a mixture of both forms. Particles needed to be carried in the intention of waves and waves needed particles to anchor their emotional intent.

Ezra Pound searched for the smallest unit of a poem (which Albright referred to as a monad, after the work of Gottfried Wilhelm Leibniz) that could serve as the intellectual building block of a poem (Albright, 1997). As Albright makes clear, Pound was captivated more so by the philosophy of Leibniz than by quantum physics. In 1714 Leibniz published *The Monadology*, which described his theory of elemental chemistry, existence, and spirituality (Leibniz, 1714). Similar to Epicurean atomic theory, Leibniz describes the smallest indivisible and therefore physically indestructible part of any object as the “monad” (or “simple substance”). Monads of one type can

join with monads of another type to form compounds. Unlike Epicurus, who had no place for divine intervention in his theory of matter and void (Lucretius, 2001), Leibniz postulated that monads can only be created or destroyed (i.e., appear or disappear from our physical universe) by divine power (Leibniz, 1714). External forces of the physical world have no effect on the properties of monads. Moreover, monads can only be altered from within, and are imbued with the barest essence of thought or perception.

Pound considered the monad of a poem to be the vibrant synecdoche of the whole and held the fundamental meaning of a poem (Albright, 1997). Having discrete units of thought and matter appealed to Pound, as he desired to rid poetry of abstraction and focus on concrete images and ideas. Pound was a champion of particle poetics, the fundamentals of which were nouns.

According to Albright, William Butler Yeats, D. H. Lawrence, and T. S. Eliot preferred a wave theory approach to poetry (Albright, 1997). Wave theory regards the universe as a plenum (interconnected soup with no vacuum). In wave poetics there are no isolated fundamentals. Each element of a poem influences all of the other elements of a poem. The universe is an interconnected web, where abstraction can permeate the infrastructure. Non-Euclidean ideas of bendable reality can exist in wave poetics. Actions, and therefore verbs, were the guiding forces behind wave poetics.

Images are discrete depictions of objects as themselves and not as symbols (or representations of other objects) and are present in many of the poems of Ezra Pound and William Carlos Williams. For these Modernist poets, the image has strong particle qualities. Emotion is conveyed through the juxtaposition of different images (i.e., parataxis) that have no direct connection with one another in order to achieve T. S. Eliot's idea of the objective correlative. An ideogram is an understanding of a singular visual aspect (e.g., a particular color or emotion) conveyed through the overlapping of images. For example, an image of a window and an image of a glass of water could be combined to convey transparency). Ideograms were considered by Ezra Pound to be the organic association derived from paratactic combinations of images, and thus the smallest pictorial representations of complex emotions. The images of Yeats on the other hand were wave-like, mysterious, ephemeral, and not always fully formed, like a reflection in a pond that is muddled by a sudden wind (Albright, 1997). Albright emphasizes Yeats' use of the ocean wave metaphor in his poetry to express the mutability of life and earth. Yeats's images often had many or indeterminate referents and therefore lacked specific symbolism. "Either of these strategies manages to save the poem from the threat of univocal meaning, one-to-one correspondence of symbol to referent: Yeats's by providing too many referents, Pound's by providing no referent at all" (Albright, 1997).

Modernist poets who explored the forces behind created images were part of the Vorticism movement (Albright, 1997). These poets were interested in the creative process and not the tangible image. "The vortex is a form for the transmission of forms. ... The vortex is a tunnel through which the subjective passes into the objective; through which the world of absolute shapes, processing in absolute rhythm, passes into the quotidian" (Albright, 1997). The vortex is the point of greatest energy formed from the collision of two or more opposing forces (Albright, 1997). That point of maximum dynamic tension was Pound's particle for energy. A popular mode of Vorticist expression was field transposition, which entails applying the dynamic forces of one physical realm onto the objects of another (e.g., applying the characteristic motions of the sea onto terrestrial objects). A prime example of field transposition offered by Albright is *Oread* by H. D. (formerly Hilda Doolittle).

Pound was unable to find a suitable monad that could sustain itself as a long poem (Albright, 1997). His energy particle, the vortex, was pushed to the limits in *Hugh Selwyn Mauberley*. This poem's title character was an art critic in search of the most emotionally elusive art forms, which were devoid of all interpersonal connection. His persona was insubstantial and teetered on oblivion, an example of the hedonistic extreme. Pound's vortex for *Hugh Selwyn Mauberley* wobbled and disintegrated without a clear focal point. On the other hand, Pound's particle of matter was the image, which he desired to make as a standalone poem in and of itself – the largest indivisible particle, like the Noh plays of Japan, in which the action moves around a single image. Both Pound's energy and matter particles could not stand up to his demands and collapsed upon themselves into nothingness.

Albright argues that T.S. Eliot's ideas existed simultaneously as particles and waves (Albright, 1997). However, Eliot's images do not collapse into a single reality once observed. In a sense, Eliot was trying to escape conveying any definitive objective correlative. Eliot wanted to experience Plato's noumenon. Eliot attempted to do so through marrying consumption with being consumed, murder with suicide, life with death and death with life. Eliot tries to reach and understand the afterlife by having Aristotle's reality consume Plato's noumenon and vice versa. Noumenon can only be understood by the living if life and death exist simultaneously. That is, the scrim between life and death is crossed as a simultaneous Mobius wave, feeding and being consumed at the same time. For Eliot, the monad was the sound the letter "r" made in the throat — that sound that is both primal, springing forth from the ooze and connected to first life, and spiritual, resonating from the lyrical ether (Albright, 1997).

While Modernists grappled and played with particles and waves, solid dispassionate images and wispy ephemera, Language poets expounded upon these themes and took a multidimensional view of language. To the Language poet, a single word could have wildly different associations and these previously unplumbed associations, these different verbal dimensions, were worth exploring. The noted progenitor of language poetry, Gertrude Stein is said to have been influenced by the cubist paintings of Pablo Picasso (Gertrude Stein Biography, Poetry Foundation). Her experimental poetry, such as *Tender Buttons*, was devoid of linear construction, temporal consideration, and contextual meaning. Like the Vorticists, her poetry focused on process. She wrote with an eye on space and physical description. Her novel *The Making of Americans: Being a History of a Family's Progress* was written as a fluid description of events or a "continuous presence" without narration, which Stein considered to be an impediment to conveying the true range and nature of human behavior. This was Stein's objective correlative. Through exposition and disassociation, Gertrude Stein imposed her own quantum poetics, the poetics of antimatter that does not make unidimensional sense but instead makes multidimensional sense and anti-sense. Her writing was the ultimate liberation of language from Aristotle's reality. Being continually present and multidimensional sans narrator places the reader in suspended animation of knowing and not knowing at the same time. There is and there is not a there there. Stein took Eliot's marrying of consumption with being consumed a step further. Stein has simultaneously viewed the monad in multiple dimensions and removed the observer (i.e., narrator) from the equation. What remains is nothing (the vacuum of empty space, no meaning) and everything (the convergence of all meaning into an incomprehensible quantum singularity). Stein may have created a unified field theory of quantum poetics: description without narration and specific in-the-moment language without confined reference.

This multidimensional view of language is shared by contemporary poet, Andrew Joron. He suggests that complexity (i.e., high-level organization) can be found at the periphery of chaos,

and it is at these edges where dynamic tensions rise above an energetic threshold and collapse into a new organized state (i.e., phase transition) (Joron, 2008). It is at these moments that chaos is used as an engine of transformation, much like how the dynamism of poetry creates a “convulsive beauty of cosmic being” (Joron, 2008). This “convulsive beauty of cosmic being,” as Joron alludes, is not a new concept to poetry. Gerard Manley Hopkins saw intense spiritual connections with nature through inscaping, which is the acquisition of intimate detail and recognition of patterns and organizational structures within nature (Gerard Manley Hopkins Biography, Poetry Foundation). The heightened awareness imparted by inscaping transcends the earthly image and creates what Hopkins called “instress,” or a heightened spiritual understanding in the reader (Hopkins, 1953).

Gerard Manley Hopkins’ poetry is imbued with spiritual energy. This energy comes from the expression of detailed images, usually from nature, in lines propelled by his surprising sprung rhythm (Hopkins, 1953). This unique rhythm is generated from varying combinations of vibrant syntactical transposition, the comingling of monosyllabic Saxonate and Old English words, alliteration, assonance, full rhyme, slant rhyme, and the creation of new words that uniquely express dynamic tension. (W. H. Gardner suggested that the word “twindle” from Hopkins’ poem *Inversnaid* is a portmanteau of the words “twist” or “twitch” and “dwindle.”) The resulting verse is highly energized and chaotic. Sprung rhythm is the rhythm of natural speech and is not encumbered by the number of syllables. It is considered to be accentual rather than accentual/syllabic verse.

Scientific terminology, conversely, uses multisyllabic, Latinate terms that can bog down rhythm quickly, thus diminishing energy and sonic vivacity. Care must therefore be used when integrating scientific terminology into a poem so as not to compromise dynamic energy.

Jorie Graham uses scientific language and concepts in her poetry to great dynamic effect. Her poems in *The Dream of the Unified Field: Selected Poems 1974-1994* feel like staged transitions – the glory of viewing the propulsive echo after acclimation – the equilibrating of body with medium after diving into water (Graham, 1995). It is the euphoria of intense focus and losing yourself in your surroundings, that moment just before peace and epiphany, the moment of transcendence. There is a desperate yearning to be one with the world, to be liquified and absorbed. This process of unification marks a phase transition from journey or despair into wisdom. At the moment of phase transition there is a flash, a glimpse of instress, where frenetic movement and details collide. Graham studies a leaf and imagines drilling down to the microscopic and molecular levels to see the motion captured within the stillness.

*I’d take a leaf—from here
(against the light) the chlorophyll exists inside the plasts
and (where sun is strongest) light
thickens
drawing the carbon
in . . .*

—from *Relativity: A Quartet* (Graham, 1995)

In her poem, *Le Manteau de Pascal*, Graham teases and challenges our perceptions of the fabric of the universe (Graham, 1996). The poem dips and weaves through memory and details of the natural and manmade world. In her poem, Graham explores the possible origins and life of a coat. She projects multidimensional possibilities onto two-dimensional planes, and then overlaps those planes to create wholly different two-dimensional representations. She rents and mends the coat to discover hidden agendas and ultimately weaves what she reaps and sews into a fabric of

wonderment itself. Jorie Graham enlists the inscaping of Gerard Manly Hopkins into the poem by incorporating directly from Gerard Manley Hopkins' journal a detailed description of an oak tree.

Lucretius, Hopkins, Joron, and Graham show us that to be completed is to no longer exist. Life is movement and change. To be fully alive is to be fully immersed in the details of the physical and temporal world relative to our fleeting impermanence. Jorie Graham ends *Le Manteau de Pascal* with the following lines:

*I will vanish, others will come here, what is that now
floating in the air before us with stars a test case
that I saw clearly the impossibility of staying*
—from *Le Manteau de Pascal* (Graham, 1996)

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