

Where Kabbalah Kisses Science: Three Points of Interface

The Quest For Unity

Science, in its quest to reveal the underlying unity within nature, constantly finds itself returning to the origins of the universe--to the primordial "day one" ("*yom echad*") of Creation.. The universe, in its present state, is too cool and solid for one to find within it an intimation of such unity. Only amid the energy and heat that reigned at the very inception of time and space, could all the forces and elements of nature meld into one. Such are the premises that underlie the unified field and "big bang" theories. Should one seek the even deeper unity that binds "existence" to "non-existence," then it becomes necessary to propose even more obscure theories--such as string theory-- which exude an almost meta-physical character. The quest for unity starts with the generally accepted principle in modern physics that time shares a common "geography" with space: just as all points in space co-exist along a single continuum, so too do all points in time - past, present, and future - simultaneously distribute within the same network.

The cosmological process that produced this space-time continuum is presently understood by many to have taken place in four stages--the first three of which are derived from the "string" theorists while the last is popularly known as the "big bang theory": First, the mathematical properties and relations governing space-time had to be defined or "created". Next, in a single quantum leap, "something-ness" emerged spontaneously out of that "abstraction". At that point, a great "inflation" of the universe occurred wherein it expanded, instantaneously, to the order of 10 to the 50th power. Finally, the "big bang" unleashed the full thrust of its force from within a single point inside that inflated universe. From then on, the universe as we know it began expanding--albeit infinitely slower than it had up till then--congealing into its present state as its structural elements proceeded to cool down. In Kabbalistic terms, these four stages can be viewed as corresponding to the four-letter sequence of God's ineffable Name--*Yud Hei Vav Hei*, the model upon which all meditation directed at God and Creation is based. The first letter of His Name, the scintilla-like *Yud*, represents the initial "contraction" (*tzimtzum*) of Divine light from which was produced the primordial vacuum of space and time. The second letter of His Name, the spatially--expanded *Hei*, represents the initial emergence of created-being ex nihilo. The third letter, the linear *Vav* (possessing the numerical-value of 6), symbolizes the sudden extension of that being into all six directions of space. It also hints at the premise contained within string theory that there exist an additional six hidden dimensions which are actually "enfolding" within the four that we commonly identify. Finally, the repetition of the letter *Hei* at the end of God's Name hints once again at the idea of expansion--this time, the final expansion of the universe whereby it settled into its Divinely-intended form.

The assumption of an underlying unity within Creation brings with it the concomitant belief in a consummate state of symmetry having characterized the incipient universe. (The mathematics of modern physics utilizes symmetry-groups when it wants to cancel out "undesirable" conceptual phenomena such as infinities.) As the stages of creation progress, this initial state of symmetry in the universe appears to break down. Thus, any return to the primordial unity of creation would seem to imply a corresponding return to maximal symmetry.

The final verse of chapter Genesis in the Bible (5:8) refers to the *chen* (pleasantness or favor) that Noah found in the eyes of God. The term *chen* is understood in Chassidic thought to imply the particular kind of graceful beauty that derives from the possession of innate symmetry. Noah, who represented the last vestige of natural grace left in Creation after the great moral decline that brought on the flood, was identified in the eyes of God as a source of *chen*--as intimated by the fact that the Hebrew letters of his name--the *nun* and the *chet*--form a mirror image of the word *chen*. Thus Noah's finding *chen* in the eyes of God figuratively suggests the identification of sufficient symmetry within Creation to arouse Divine compassion and save the world from utter destruction. The pupil of the eye is actually referred to in Hebrew as the *ishon*--literally, "little man" - perhaps hinting at the image of Noah which occupied the center of God's vision while assessing the future of His creation.

The Bible commonly refers to the eye as the ultimate gauge of *chen*. The role that symmetry plays in the process of visual perception is clearly expressed through the function of the lens which generates an inverted image of the visual cue upon the retina that is only afterwards reprocessed by the brain so as to produce the rectified image that we actually see. This indicates to us that the way to discover the hidden *chen* of the universe is to try and envision an "inversion" of reality--whereby Divinity is fully revealed while Creation's material aspect recedes into abstraction.

The Descent of Creation to a State of Rest

Another foundation of modern physics is cited as the postulate stating that all physical structures tend toward their lowest possible energy level. This fundamental principle is reflected in the Kabbalistic doctrine of "descending worlds" whereby Creation is viewed as descending from the infinite energy of Divine Being into the stasis of material reality. The purpose of this descent is ultimately to provide God with a "*dora b'tachtonim*"--a "dwelling-place in the lowest realms"--where the Glory of His Kingdom might become eminently manifest by virtue of the effect that the service of Torah and *mitzvot* have upon the created order.

The revelation of Divine Majesty which will attend the final rectification of our physical world will far outshine any previous revelation of Godliness in the history of Creation. For this reason the tendency to "descend into materiality" overpowered the initial state of sublime symmetry which characterized incipient Creation. The universe is in essence seeking out that "lowest energy state" from within which it is destined to manifest a radical new symmetry within Creation: that which harmonizes God's primordial perfection with the deficient realm of material reality.

In Kabbalah, the property of "descent" associated with the material realm achieves its ultimate expression in water - which by nature flows downward, seeking out the lowest ground. The opposing property of spiritual ascent is modeled in the flame of fire, consuming matter in its attempt to ascend upward. Ultimately, the force of gravity associated with water supersedes the force of lightness connected with fire--just as the world's grounding in materiality over-rides its inner desire to be consumed within Divinity.

According to most physicists, the universe has already achieved its lowest level of energy distribution. This would mean, according to Kabbalistic faith, that the world is about to enter into a new state of symmetry. The Sabbath can be seen as providing the ultimate metaphor for this new reality.

We should try to envision Creation as a process which proceeds from one sabbatical state of balance and harmony to another. The first "Sabbath"--identifiable with the infinite expanse of Divine Light that initially permeated all reality--was a reflection of God's "first thought" regarding the imminent Creation that was to follow: that it be constructed upon the principle of "din"--strict measure contributing to ideal form. The symmetry implied by this

program was one of perfect uniformity, as inspired by the absolute One-ness of the Divine Light out of which it was conceived.

A deeper intention, however, emerged with God's decision to jointly apply, together with "*din*," the principle of "*rachamim*"--Divine compassion. It was this attribute that was responsible for the "tolerant" form that Creation eventually took - one which accommodated the imperfections of finite material reality. Having begun its "descent," the universe set out on the mysterious course toward the "Sabbath-to-come" when the world will be redeemed from its restlessness and turbulence.

The above depiction of the opposing principles at work in Creation is reflected in the famous *Midrash* describing how the two attributes of *chesed* ("Benevolence") and *emet* ("Truth") appeared before God prior to Creation and argued over whether the world should indeed be brought into being. Truth demanded that this world not be created as it would eventually become filled with the "asymmetry" of lies and falsehood; Benevolence, arguing that a material creation can never justify itself, demanded that the world be created nonetheless if only by merit of God's Kindness as well as the opportunity it gives us to enrich one another. The *Midrash* concludes of course with God's favoring the position of Benevolence as He proceeds to "cast Truth to the ground"--an act that reflects His desire that strict idealism be tempered by empathy and consideration for the limitations of finite existence. Implicit in this act is the wish that "Benevolence and Truth meet each other, Justice and Peace kiss; that Truth spring out of the earth and Justice look down from Heaven." It is the revealed symmetry between Benevolence and Truth that will grace Creation as it enters into its eternal Sabbath-day.

Recognizing Creation's true purpose and destiny necessitates that the Divine Soul enclthe itself within a physical body. Only then can man fulfill God's Will through the grounded pursuit of Torah and *mitzvah* service. Ultimately the fulfillment of this mandate will serve to arouse a revolutionary Divine spirit laying dormant within the universe. The successful awakening of this spirit will expose God's true intention in generating the descent of Creation: the ultimate sanctification of His Name and Kingdom along with the ascent of Mankind and all reality to a plane infinitely higher than that from which they initially set out. The majesty of the Messianic age - the eternal Sabbath of the future--is a reality that we slowly construct through the Divinely revealed discipline of thought, word, and deed which shapes every passing day of life in this world. It is a discipline that, by allowing us to refine our consciousness of the Divine perfection underlying reality, renders us all architects of a new world order. The perfection of the Sabbath is immutable and eternal; only our consciousness is subject to the variance and distortion imposed upon it by the material shell in which it is encased. By neutralizing the effect of that shell, we simply free the soul's native awareness of Divinity so that it can assert itself supremely and thereby illuminate the true essence of material reality. Thus, the culmination of this process requires that every last semblance of material-being be illuminated and "clarified" by our consciousness of the Divine. This is the reason that Creation must descend to its lowest level before the hidden symmetry of the Sabbath can manifest itself forever and ever.

Our present physical reality bears little hint of the future greatness for which it is destined. What we perceive with regard to the "descent of Creation" is the related physical phenomenon of "entropy" whereby the universe appears to be proceeding inexorably forward in time toward greater and greater decomposition. The force of entropy is reflected in the Kabbalistic concept of *Tohu* (chaos). The eventual defeat of *Tohu* through the force of *Tikun* (rectified order and symmetry) is not evident at the macrocosmic plane of human experience, just as time-reversal and many other proven phenomena of quantum reality are not.

But from the wondrous realm of subatomic reality--the hidden microcosm which only God can "know" directly--numerous intimations of Creation's true character surface. Elementary particles move backward in time, leaving "footprints" that are experimentally observable. Thus, the force of *Tikun*--of negative-entropy--can be said to reside safely within the realm

of the infinitely small. Man accesses that force by rendering himself equally small and humble so as to share in God's unobstructed vision of reality. In conclusion, we now see how three fundamental tenets of modern science--the underlying unity of nature, the uncertainty built into subatomic reality, and the universe's tendency toward increasing dissipation--end up "kissing" Kabbalistic belief at three junctures: the primordial past (belief in the initial Divine unity out of which Creation was conceived), the continuous present moment (belief in the ongoing construction of reality through refined consciousness), and the developing future (belief in the higher unity that will assert itself once every last element within Creation is illuminated by the soul).

The Uncertainty Principle

Next to the underlying unity of nature, the most "enlightened" focus of modern scientific inquiry can be thought of as the intimate relationship between consciousness and the laws of physical reality. The uncertainty principle of quantum physics, which in essence establishes the impossibility of simultaneously determining certain pairs of subatomic phenomena (such as position and momentum), implies that the very act of human observation--or "consciousness"--irrevocably affects one of the properties which one is observing. Physicists disagree as to what degree of consciousness is necessary to the measurement of physical reality. Nevertheless, the implication remains--as supported by the corresponding meta-physics of Kabbalah--that consciousness can determine of its own the nature of the world we seek to know.

The uncertainty principle is a good example of how the fundamentals of modern physics can contradict the axioms of common sense. Ultimately, the intellectual courage to challenge the consensus of reason derives from the suprarational force of faith inherent within the Divine soul. Before the advent of quantum physics, science believed that determinism ruled the universe. Now, with the principle of uncertainty, it has become clear that nature cannot be explained in purely causal mechanistic terms. The most we could talk about is "probability", thus leaving room to re-accommodate such "unscientific" phenomena as free-will and moral responsibility which had been entirely dismissed by earlier scientific thinkers.

The litany of modern physics is replete with assaults upon common sense: the speed of light remains constant regardless of the circumstances surrounding its measurement; energy-changes in the universe occur at fixed "quantum" intervals (Planck's constant) rather than in contiguous increments. These two "constants" in nature--"c" (the speed of light) and "h" (the quantum-energy unit)--change forever the way we conceive classical concepts such as "infinity" and "zero". A third "constant" in nature, derived from these first two and positioned--as it were--between them, is the "inverse of fine-structure constant" equal to the "pure" (i.e. dimension-less) number of 137. (The number 137 is also the numerical equivalent of the word *Kabbalah* in Hebrew.) Together, these three constants comprise a set that corresponds to the sequence of stages in one's service of God explained elsewhere in *Chassidic* tradition.



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