The Solar Archetype

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Papers:

Symmetry Principles of the Unified Field Theory (a "Theory of Everything") - Part I
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The radiance of our Sun announces the completion of a symmetry conservation cycle

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Abstract

The primordial role of gravitation is to supply sufficient negative energy to balance the positive energy of the "Creation Event", so the Cosmos may be born from a condition of zero net energy. Matter and antimatter are also present in equal amounts, so the Universe is likewise born from a condition of zero net charge. All latter-day gravitational conservation roles are derived from and reflect gravity's primordial energy-conserving role.

Gravity has two primary conservation roles in today's universe: 1) entropy conservation (at all gravitational field strengths), and 2) symmetry conservation (at high gravitational field strengths). Entropy conservation is accomplished by the gravitational annihilation of space, exposing a metrically equivalent temporal residue. The annihilation of space converts the expansive spatial entropy drive of free energy (the intrinsic motion of light), to the expansive historical entropy drive of bound energy (the intrinsic motion of time). The *implicit* temporal drive of spatial expansion (recognized as the time component of "spacetime") is converted to, (and conserved as), the *explicit* temporal drive of history - via gravity. Symmetry conservation is accomplished by the gravitational conversion of bound to free energy (mass to light) in stars, and related astrophysical processes, and ultimately and completely, via Hawking's "quantum radiance" of black holes. Sunlight indicates the completion of a symmetry conservation cycle: light -> matter -> light, which begins with the conversion of light to matter (free to bound electromagnetic energy) during the "Big Bang", and ends with the gravitational conversion of bound to free energy in stars, black holes, and possibly, the "Big Crunch".

Introduction

I have always regarded the Sun as (at least) semi-sacred. I have long thought of the Sun and Earth as a male-female pair of godlike beings, either one sterile in the absence of the other, but together having the immense potential of producing a galaxy-colonizing life form: space-faring humanity. (See: "The Human Connection".)

From the very beginning of my focused research (since my 40th year, 1977), I believed that the Sun physically embodied and held the key to the unified field theory - that if we could understand the Sun, we could understand the theory. This because the Sun converts matter to light - returning matter full circle to its origins - and to understand this process and the circle fully, means understanding both matter and light fully, and physically that is all there is. Moreover, this is a natural and spontaneous, not an artificial or forced, process. This is Nature speaking in her own voice of the unity of matter and light. Hence in the solar transformation we should be able to discover clues to the unified field theory, the theory which unites free and bound energy. The Sun is the unified field theory in action, the great archetype and example which not only brings forth life on Earth, but in humanity brings forth understanding as well. (See: "Currents of Entropy and Symmetry".)

The appearance of the hydrogen bomb on Earth is a sad signal that the solar fusion process has been captured by the human mind in its raw or primitive (and very inappropriate) form, meaning we now have enough scientific knowledge to understand this final theory of matter and light, Einstein's dream. The Sun indeed does hold the secret of the theory, the meaning of light and matter, of time and space, of gravity, charge, and force. We have only to think of these energy forms in the appropriate terms of principle and natural law; the Sun integrates all the natural forces, and the result of this summation is light - the conversion of bound to free energy.

The Conversion of Bound Electromagnetic Energy to Free Electromagnetic Energy

When left to themselves, the forces of nature spontaneously convert matter to light. Stars like the Sun begin the job; Hawking's "quantum radiance" of black holes completes the transformation. Looking up at the night sky, we see that the entire galaxy is busy at the same task. And this is only the gravitational pathway - nucleosynthesis followed by supernova and quasar phenomena, followed by "quantum radiance".

Two other major pathways converting matter to light exist, matter-antimatter annihilation via the electromagnetic force, and particle and proton decay via the interaction of the strong and weak forces. Almost all of the matter in the Universe has already been converted to light via electromagnetic annihilation with antimatter in the first moments of the Big Bang - only approximately one particle in ten billion of the original amount of matter remains. (Matter/antimatter annihilations continue today in the suppression of virtual particle pairs by the electromagnetic force, a maintenance activity protecting vacuum symmetry.) What we see today is just a minor "mopping up" operation, conducted by the remaining forces along two fronts: the "social" or gravitational tactic, the conversion of matter to light in great masses (stars); and the "individual" tactic of particle and proton decay involving the strong and weak forces. Between these four pathways, not a single atom of matter will escape an eventual transformation to light. But the Sun is the ancient, obvious, intuitive, and archetypical example; the others we have only recently discovered through the rational achievements of our science.

Noether's Theorem

When we ask why this should be, why is matter everywhere and by every natural force being transformed to light, we are quickly led - by our modern scientific understanding - to a conceptual formulation of the principles and conservation laws that underlie and frame the unified field theory.

In the first place, we understand that matter is not only being transformed to light, it is being *returned* to light, a crucial difference: matter began as light in the "Big Bang", and the natural forces are simply returning matter to its original and symmetric form. Again, we ask why - why do they bother? Why not leave matter just as it is? The reason is a conservation law discovered by Emmy Noether. The universal return of matter to light is in obedience to a mathematically formulated conservation law known as "Noether's Theorem". This great theorem has become the basis of all formal (mathematical) attempts to unify the forces (via "Group

Theory").

Noether's Theorem will also serve as the major point of leverage in our much more modest conceptual (non-mathematical) formulation of the unified field theory, which nevertheless will be built strictly in accordance with the conservation laws of standard physics. We will arrive at our goal before the mathematicians simply because this is the easier path. It is much like learning to talk before learning to read or write. Talking is easier, and serves the purpose of communication, but it is very limited in its powers compared to reading and writing. In these papers we will have to be content to learn to talk only, and leave the more difficult "reading and writing" to the mathematically gifted among us. But in our talking we will nevertheless obey the rules of grammar that are also observed by reading and writing - the conservation laws of physics are the same - so that when the mathematicians do arrive on the scene, we will already have laid solid foundations within a common language and story.

"Noether's Theorem" states that in a continuous multicomponent field, such as the electromagnetic field (or the metric field of spacetime), where one finds a symmetry one will find an associated conservation law, and vice versa. Noether's Theorem is saying that in the conversion of light to matter, not only must the raw energy of light be conserved in the mass and momentum of particles, but the symmetry of light must also be conserved - not only the quantity but the quality of energy must be conserved. The theorem does not say exactly how this must be done, but in practice the symmetry of light is conserved through the charges of matter - charge conservation = symmetry conservation in a temporal form - and the symmetry of the metric field of spacetime is conserved through inertial and gravitational forces.

I think of Noether's Theorem (1918) as the "Truth and Beauty" theorem, in reference to Keat's great poetic intuition ("Ode on a Grecian Urn"; John Keats,1819):

> "... Beauty is truth, truth beauty, - that is all
> Ye know on earth, and all ye need to know"

in which Beauty corresponds to Symmetry and Truth corresponds to Conservation. Keats did exactly what we are attempting to do in these papers: achieve an intuitive understanding of natural law which is in complete accordance with a formal theory yet to be realized. It is a great example - among many others - of how the same truth can be appropriately apprehended by both the intuitive and the rational powers of the human mind. It is almost always true that the intuitive understanding comes first - sometimes by thousands of years ("for now, we see as through a glass darkly...").

Noether's theorem tells us why the forces of nature are busy converting matter to light: matter was created from light in the "Big Bang", but since light has greater symmetry than matter, it is to conserve light's original symmetric energy state that all the charges and forces of matter work to accomplish the return of bound energy to its former state of greater symmetry. *The charges of matter are the symmetry debts of light*. These charges produce forces which act to pay the debt and return the system of matter to its original symmetric form, light.

Unification

A program of unification is therefore clearly indicated by Noether's Theorem: identify the (broken) symmetries of light carried, represented, and conserved by the charges of matter. The nature and actions of the forces produced by these charges should offer clues as to what these (broken) symmetries are. This will allow us to refer all the charges and forces of matter (including gravity) to their respective origins as specific symmetries of light, accomplishing our conceptual unification. Matter is but an asymmetric form of light, just as time is an asymmetric form of space, and gravity is an asymmetric form of the inertial forces of the spacetime metric: the charges and forces of matter act to return bound energy to its original, symmetric state

of free energy. In the papers linked below, and others on this website, we will follow out this simple program of force unification, identifying the broken symmetries of light represented by the conserved charges of matter. (See: "Symmetry Principles of the Unified Field Theory" (parts 1, 2, 3); also: "General Systems and the Unified Field Theory" (part 4)).

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- (Postscript and Commentary on paper above)
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