Alternative Charge Carriers and the Higgs Boson: Part I
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Abstract

A functional class of particles, the "Alternative Charge Carriers" (ACCs), is recognized as characteristic of the Electroweak domain and the Weak Force Intermediate Vector Bosons (IVBs).

The photon is the massless gauge boson of the electromagnetic force, and its large, spatial, intrinsic entropic motion ("velocity c"), creates the huge (and cold) "metric domain" of 4-dimensional spacetime. The massive Higgs boson has no intrinsic spatial motion, but instead regulates or "gauges" a spatially tiny high-energy "particle domain" consisting of three species of massive "gauge" particles - the weak force IVBs. Acting through the IVBs, the Higgs controls a numerically huge functional class of virtual or potential particles: the Alternative Charge Carriers (ACCs), which upon demand are made "real" from the "virtual particle zoo" by the IVBs. The ACCs serve to carry and transfer charges among and between baryons and leptons during decays, transformations, and other interactions. Within our asymmetric "matter-only" cosmos, the ACCs allow charge conserved interactions despite the absence of antimatter, thus avoiding annihilation reactions. The familiar proton-electron atomic pair is the prototypical example. Our universe could not exist without the services of the ACCs, as the original weak force asymmetric interaction required a charge-conserving ACC to break its matter-antimatter symmetry. The ACCs include leptons, neutrinos, and mesons, all particles whose original (primordial) masses are regulated by the Higgs through the IVBs, ensuring the invariant transformation of elementary particle identities, mass, and other conserved charges and parameters (especially *single* particle transformations, not just particle-antiparticle pairs). The weak force IVBs (W+, W-, Z neutral) are special (massive) mediating field vectors, which select the appropriate ACCs from the primordial domain of high-energy spacetime (the Higgs sector of the Heisenberg/Dirac virtual particle "zoo"), and then effect its transfer. The great mass of the IVBs is necessary to access any particle sequestered in the invariant, primordial, Higgs sector energetic domain, but they are not themselves an ACC. They are instead a high-energy, quantized, invariant symmetric-energy state, maintaining the invariant symmetry (sameness) of elementary particle charge and mass. (See: "The 'W' IVB and the Weak Force Mechanism".)

The massive Higgs boson and its IVBs recreate the primordial energy-density of spacetime in which the ACCs were first made during the early moments of the "Big Bang". The Higgs-IVB mechanism acts like a "Bureau of Standards" against which any new ACC must be referenced or measured. Suppose you want to transform a baryon, as in a neutron decaying to a proton? Very well, you must go to the Higgs energetic domain and ask the appropriate IVB for a "standard issue" ACC to do the job. Anyone who has served in the military will recognize this analogy to the function of the Quartermaster (Higgs), supply sergeant (IVB), and supply depot (virtual particle "zoo"). In the case of neutron "beta decay", you will need a meson to "swap out" the quark flavors/colors, an electron to carry the electric charge, and an electron antineutrino to balance the electron's identity (number) charge, since the electron is newly minted. A negatively charged "W" IVB of about 81 proton masses can access the appropriate energy sector of the primordial Higgs energy domain and get the requisite ACCs. The bureaucracy and record keeping may seem tedious, but only in this way can elementary particles created today or tomorrow be exactly the same as those created eons ago in the "Big Bang" - maintaining the elementary particle symmetry of our universe, which ensures that any elementary particle ever created can "swap out" with any other (of its type), or annihilate at any time with an appropriate antiparticle - the ultimate act of symmetry-restoration/conservation. Note that the supply room of the electroweak Higgs primordial energy domain does not contain any baryons (protons/neutrons). While there are ACCs to effect the transformations of baryons (such as neutron-proton transformations), brand new shiny (primordial) baryons are only created during the earliest moments of the "Big Bang" in reactions controlled by a different (heavier) Higgs and IVB. See: "The Origin of Matter and Information"; See: "Table of the Higgs Cascade".

In a universe lacking antimatter - such as ours - ACCs serve to balance charges and preserve charge conservation during particle interactions. ACCs enable the decay of heavy hyperons, quarks, and lepton "families" to our familiar electromagnetic ground state through channels that obey charge conservation, despite the lack of antimatter in our Cosmos. Hence the ACCs are yet another conservation consequence of our "matter-only" Universe. The Higgs boson may be thought of as a gauge particle or "marker" for the convergence of the weak and electromagnetic forces: the specific energy level necessary for the weak force creation of *single members* (rather than particle-antiparticle pairs) of the ACC class of particles.

Space is the entropic/energetic conservation domain of massless light (free electromagnetic energy); historic spacetime is the entropic/energetic conservation domain of massive particles (bound electromagnetic energy). While the photon establishes a dimensional "spacetime metric" (in which 300,000 kilometers of distance is metrically equivalent to one second of time), the Higgs boson establishes an electroweak particle metric or "symmetric energy state" at 125 GEV (at which energy the electric and weak forces are equivalent). Both are symmetry conditions, for at "velocity c" the asymmetric time dimension vanishes, and at 125 GEV the specific identities of the leptons are subsumed into a single "generic" leptonic identity, and likewise the specific flavors of the quarks vanish into a single generic quark identity. It is these generic identities (symmetric energy states) which the weak force IVBs "sample" to select specific quark/leptonic flavors for the purpose of identity transformations among elementary particles. We may think of the Higgs boson as the gauge boson of the electroweak ACC "zoo", or virtual particle "sea", of the Heisenberg/Dirac spacetime "vacuum".

The "Standard Model" of the "Higgs mechanism" of the electroweak force proposes four Higgs particles - one each for the W+, W-, and Z neutral (the "Intermediate Vector Bosons" (IVBs) or field vectors of the weak force), and a fourth scalar boson which gauges the intersection of the weak and electromagnetic forces. This fourth Higgs is the one recently discovered at CERN. The W and Z were also discovered - at CERN - in 1983. The math of this complex theory was worked out by Weinberg, Salam, and Glashow, 1967. Peter Higgs (and others) proposed the "Higgs boson" in 1964, as the source of elementary particle mass.`(See: "*Most Wanted Particle*" by Jon Butterworth, 2014, The Experiment LLC, pages 96-99 and 237 - 238; see also: "*The Large Hadron Collider*" by Don Lincoln 2014, The Johns Hopkins University press, pages 126 and 133 - 135.)

In the real world (as opposed to the theoretical/math world), how do we see these theories manifest? Science has long noted that the electromagnetic force with its field vector (the photon of "light") is evidently composed of two forms of energy, one the massless photon, and the other a virtual component consisting of particle-antiparticle pairs (leptons and quarks), which materialize and annihilate one another essentially instantaneously. Ordinarily, as this virtual particle component of electromagnetic energy tries to materialize, it is kept in its virtual state by matter-antimatter symmetry, which causes the annihilation of these virtual particles as soon as they appear. Such particles comprise a "vacuum sea" of virtual particles, coextensive in our universe with spacetime. Given sufficient energy, this "sea" of virtual particles is available for particle interactions, transformations, and even creation/destruction, and the weak force makes use of it via the mediation of its IVBs.

The great mass of the Higgs and IVBs reproduces the energy density of the early universe when these particle pairs were in abundant supply and essentially identical to each other (because the energy was so extreme). The massive IVBs are thus enabled to "sample" or select particles from that portion of the Higgs "sea" (domain) which its mass reproduces. Selected particles are then used to effect elementary particle interactions/transformations. (See: "The "W" IVB and the Weak Force Mechanism"). This mode of action allows the IVBs to exactly reproduce elementary particles from the original "sea" or primordial source, preserving the necessary universal symmetry of elementary particle parameters of mass, spin, charge, etc. Because the mechanism depends on mass to reproduce these primitive conditions, it is unaffected by the entropic expansion of the spatio/temporal universe; hence electrons produced today are (and must be) identical in all respects to those produced eons ago. With regard to the uniformity of its productions, it is important to note that because the Higgs is a particle with mass, it is possible for the Higgs energy domain to be very precisely defined. The universal and necessary symmetry among elementary particles in terms of mass and other physical parameters is the reason why the weak force is so strange, with its massive IVBs: the weak force must be able to reproduce *single* elementary particles (not just particle-antiparticle pairs) - that are absolutely identical in every respect to all others (of its type) that have ever been, or ever will be, produced - past, present, future. This is a tall order (which only the weak force can fill), and it is one of the defining parameters, constraints, and peculiarities of our "matter only" universe, responsible for the oddities of the weak force and the Higgs boson.

Let's put all this in terms of another familiar analogy (for those who don't care for the above "quartermaster" analogy): the Higgs mechanism is like a government mint which must stamp out coins in various denominations, but (naturally) of identical value within kind. It's easy to understand why all one cent, five cent, and ten cent coins (etc.), must be of equal value within type (contain the same quantity of precious metal), for the sake of the stability of the country's financial system and the public trust. Here, money/precious metal is the analog of energy, the financial system represents conservation law (such as the conservation of energy), and the various coin denominations represent the various elementary particles. The Higgs mechanism represents the government mint, and the W and Z IVBs represent the massive presses stamping out coins - some of positive value (W+) (positrons, positive quarks); some of negative value (W-) (electrons, negative quarks); some of neutral value (Z zero) (neutrinos).

This government mint serves a vast country called the Electroweak Domain, and the coins it stamps out are the electron, muon, and tau, their corresponding neutrinos, and their antiparticles. This mint also produces mesons of positive, negative, and neutral varieties, in various denominations depending upon their quark content. The mesons are used as ACCs in baryon transformations, because they carry various quark flavors (in addition to electric charge), and the leptons and neutrinos are used as ACCs (of electric and identity charge) in transactions and transformations among and between leptons, mesons, and baryons (see: "The 'W' IVB and the Weak Force Mechanism"). Within type, all these coins must be identical, for obvious financial and energy conservation reasons. The total collection of coin dies and precious metals available from the mint (the potential range of its particle productions) is a cosmic parameter characterized/determined by a particular Higgs boson of unique mass/energy - in this case, the electroweak Higgs scalar boson. The name of this mint is the "Electroweak Alternative Charge Carrier Mint". It only produces ACCs.

The "heavy hitters" in our electroweak domain are baryons (protons and neutrons), as they generally carry much more mass (value) than the leptons. But although the Electroweak Mint (Higgs mechanism) can stamp out mesons with various quark flavor combinations and hence permit the transformation of baryons (as in the decay of a neutron to a proton), the electroweak mint simply does not possess a press (IVB) massive enough to stamp out (or destroy) baryons themselves. To obtain newly minted baryons (or destroy them) we have to visit an entirely different country (smaller, hotter, and denser), the domain of the G.U.T. (Grand Unified Theory). In the country of the GUT the electroweak and strong forces are unified, allowing the minting of *single,* original baryons. (See: "The Origin of Matter and Information").

The GUT mint has a very heavy press (the "X" IVB), which can stamp out (or destroy) baryons themselves. But this country is so far away that we will probably never be able to visit (at least not via CERN and the LHC), although we know it exists because we are up to our ears in baryons (protons and neutrons), and they have to come from somewhere. In the electroweak domain, we can transform baryons but we cannot make or destroy them. Like Frodo's magic ring, baryons can only be destroyed in the furnace where they were created. And there may be yet another country (smaller, hotter, denser), further away still, the "TOE" ("Theory of Everything" or " Planck" domain), with another mint/Higgs mechanism and an ultraheavy press ("Y" IVBs), which stamps out/destroys leptoquarks. But that domain is so close to the "Big Bang" or "Creation Event" that nobody can get anywhere near it. (See: "The Higgs Mechanism and the Weak Force IVBs"; See also: "Table of the Higgs Cascade").

We should note that there is no theory for the GUT that suggests it should include a symmetry-breaking photon/IVB split, as in the electroweak domain. Consequently, the GUT mint may not exist within a large spacetime domain; indeed, in our view, proton decay occurs mainly inside black holes. Likewise, proton creation occurs so early in the development of the universe that there is no appreciable spacetime to speak of, and certainly no freely traveling photons. Leptoquark creation is earlier yet (during the TOE), within an even more opaque and spatially constricted arena.

We, obviously, can live only in the cold and low-energy electromagnetic domain, on Earth-like planets, where only chemical interactions (electron shell interactions) are the rule. The nuclear transformations in our Sun are the evidence of the activity of the electroweak IVBs creating leptons, neutrinos, mesons (the ACCs), as well as photons, in the nucleosynthetic process producing helium from hydrogen. We find our planetary chemical electromagnetic domain (which can only muster up, for example, a coal-burning fire), dependent upon the solar energy of nuclear transformations and the IVBs of the electroweak domain. (These same IVBs are also engaged in any "radioactive" nuclear transformations here on Earth.)

While the "mint" analogy may be appropriate in terms of energy vs finances, it does not tell us how the presses (IVBs) actually make particles with mass (although compression is implied). I have assumed that the great mass of the IVBs represents an example of the energy density of the early universe during the time the "leptonic spectrum" of elementary particles was first created (electron, muon, tau, leptoquark). Mass is a necessary feature of the Higgs mechanism because mass (as bound energy) is not susceptible to the entropic enervation of cosmic expansion over the eons - ensuring an accurate reproduction of particles whenever/wherever they may be replicated. Mass also suggests compression, and compression may well have a large part to play in the conversion of freely traveling electromagnetic waves (photons) into a bound and spatially stationary form of electromagnetic energy (matter). We know that both massive particles and light are electromagnetic in character and are derived from one another, as matter-antimatter annihilations unambiguously inform us, as do also the high-energy "atom smashers" or colliders (such as the Large Hadron Collider or LHC) at CERN, etc. The exact means whereby light is converted into particles - now or in the early Universe - is not known, but it must involve (at least) a conversion from two to four dimensions and from intrinsic motion in space at "c" with no entropic motion in time, to intrinsic motion in time with no entropic spatial motion; the acquisition of various conserved charges, etc. Possibly a dimensional or topological "knot" is involved. (See: "The Higgs Boson vs the Spacetime Metric".)

As for the mysterious Higgs boson itself, it acts as a boundary marker or "gauge" for the threshold of the electroweak domain, the energy at which the electromagnetic and weak forces join, and *(single)* Alternative Charge Carriers may be produced. At this high energy all the leptonic particles are equivalent, and all the quark flavors are equivalent (but quarks vs leptonic particles are still separate - they will join in the next higher energy level, in the domain of the GUT). The electroweak energy level is the domain in which *(single)* Alternative Charge Carriers may be created, destroyed, and/or transformed - mesons, leptons, and neutrinos. It is these ACCs that allow the transformation of baryons (but not their creation or destruction), and ACCs are typical of the energy level of the electroweak force and its usual activity (of which our Sun is the archetypal example). The electroweak energy level allows (via the mediation of the IVBs and ACCs), the nuclear transformations which characterize the stars, while the chemical (electron shell) energy level characterizes the planetary realm. Life utilizes even weaker, specialized biochemical bonds - such as hydrogen bonds. (See: "The Fractal Organization of Nature".)

Virtual IVBs "sample" the mass-energy domain of the Higgs boson, then faithfully reproduce *single* examples of the ACCs: massive mesons (consisting of quark-antiquark pairs), leptons and neutrinos. In this view, the Higgs itself does not confer mass directly upon the elementary particles, as in the standard "ether drag" model, but only indirectly through the IVBs. The mass of an IVB is understood as the energy density of a primordial era, and is not a permanent feature of any particle. Likewise, the Higgs lives only at the intersection of the weak and electromagnetic forces, so it marks and "gauges" the boundary of a symmetric energy state, in which all leptons are equivalent (among themselves), and likewise, all quarks are equivalent among themselves.

In the "Standard Model", the Higgs and the photon separate at the threshold of the electroweak state, the Higgs remaining massive and the photon remaining massless ("electroweak symmetry-breaking"). The photon goes on to create universal spacetime, with the Higgs as a universal (but "virtual") feature of this self-same spacetime. Stars everywhere and everywhen use the same electroweak Higgs and IVBs to produce the same nuclear transformations. The Higgs presence must be virtual in our present-day cold, "ground state" universe; the "real" Higgs is available on demand given enough energy - as at the LHC (CERN). Presumably, there is a distinct Higgs-like boson distinguishing or "gauging" the boundary of each confluent energy level (the EW, GUT, and TOE). (See: "Table of the Higgs Cascade".)

We live in an era of information-building in the stars (as the electroweak ACCs transform baryons and build the elements of the periodic table), and life-building on the planets, as the universe awakens to itself, using the information (from the Periodic Table) passed down from the stars and the electroweak force to our cool electromagnetic/biochemical planetary domain.

Both the "Steady State" and "Big Bang" cosmologies can be simultaneously entertained: the all-symmetric Multiverse is the "Steady State", mighty, eternal, immortal, and fertile, forever "budding off" asymmetric universes similar (?) to our own, ephemeral and of explosive origin, but requiring no net energy to create (because of the negative energy of gravity and the equal admixture of matter with antimatter - at least initially). Our universe would therefore seem to be an exploration of the creative powers of the Information Domain - perhaps one of infinitely many. In this case the Universe is what we choose to make of it, to do with as we wish and are able - including committing suicide by abusing ourselves and/or our planet. The responsibility is all our own, although Nature will help if we work with her rather than against her.

The Enigma of Mass

Single elementary particles acquire "rest mass" (E = mcc) from the weak force IVBs, by revisiting the original energy density of the era in which they were first created (the Higgs boson energy density). "Rest mass" immediately acquires a gravitational field (and associated time dimension), which is exactly proportional to its total rest mass (Gm), whatever the source of the mass may be, whether elementary particle mass or "binding energy" (in composite particles like baryons). "Inertial mass", or "mass due to acceleration" arises from forcing a particle's metric-warping gravitational field through the metric field of spacetime (resistance of one metric field to the intrusion of another metric-warping field). Gravitational "weight" (gm - as on the surface of planet Earth) is due to the reciprocal acceleration process - the metric field of spacetime is accelerating through the warping gravitational field of the stationary particle (f = ma). In this series, all the "m's" are equivalent, and derive from the same "rest mass" source (Einstein's E =mcc). The Equivalence Principle is upheld and explained. Inertial mass of acceleration is not due to "ether drag" by the Higgs field, but to the "ether drag" of a particle's metric-warping gravitational field as it is forced through another metric field (spacetime), which resists the warping influence of the intruder. "g" forces are absent without acceleration, since in that case the fields are not forcing or extending/expanding their "warping" influences into each other. Although gravitational fields are weak, they extend throughout spacetime. Because the local metric field of spacetime is influenced by the total gravitational effect of all stars/galaxies in the cosmos, this mass-generating mechanism bears a distant relationship to "Mach's Principle" of inertial resistance. (See: "The Higgs Boson vs the Spacetime Metric".)

Postscript I:

Let's take another look at "proton decay". Why is it so much harder for baryons to completely decay than leptons? We find that at the electroweak energy level - energies found in the IVBs of our Sun - baryons may be transformed but not created or destroyed, whereas leptons, mesons, and neutrinos can be both transformed and created/destroyed. So far as we know, since the time of the "Big Bang", no new (single) baryons have ever been created, and likewise, none have ever been destroyed (particle/antiparticle pair creation sums to zero and doesn't count). The problem is one of a lack of suitable Alternative Charge Carriers; baryons carry two conserved charges that leptons lack: 1) color charge, carried by all quarks and gluons; 2) baryon number charge, the analog of lepton number ("identity") charge, the latter carried in "implicit" form by all massive leptons and in explicit form by neutrinos. Neutrinos function as ACCs for the massive leptons with respect to lepton number or identity charge, but a baryon neutrino has yet to be discovered, if it exists at all. (See: "Lepton Number or Identity Charge".) Both color and baryon number charge are strictly conserved, so both must somehow be canceled, neutralized, or otherwise balanced before a baryon may be created or destroyed.

The color charge of the baryon's strong force, which functions to keep the three quarks of a baryon confined within the tiny region of the atomic nucleus, is carried by a field of 8 "gluons", massless field vectors moving at velocity "c". Each gluon is composed of a color/anticolor charge pair. (There are three color charges ("red, green, blue" - purely names of convenience with no relation at all to color in the sense of a pigment). Quarks also carry color charges, and it is the round-robin exchange of color charges between quarks (via gluons) that permanently confines quarks to the nuclear boundary (unlike photons and electric charges, all gluons and color charges attract each other). The total color field of any atomic nucleus always sums to zero color (or color neutrality - "white"), and this charge must be conserved. There is no ACC available to carry the total color charge of the baryon - only an antibaryon can do it - and herein lies a major sticking point for baryon creation/destruction (or "proton decay" as the problem is generally known - the aforesaid missing baryon neutrino is another problem). (Mesons are always color-neutral, carrying color-anticolor charges of the same color, and hence cannot function as an ACC for the color charge of a 3-quark baryon.)

However, there is an "internal" solution to this color-charge conservation problem, not requiring an anti-baryon, which stems from the origin of the quarks as three-way partitions of a primitive heavy lepton (the "leptoquark"). The total color charge of a baryon must sum to zero ("white") - both because their parent particles (the leptons) began with no color charge at all, and because (in consequence) gluons carry color/anticolor charges in all possible combinations, summing to the original zero color charge ("white") of the parent lepton. This means that if we can compress a baryon sufficiently and symmetrically it will return to its original leptoquark state and the color charge will self-annihilate. (Note that we are once again contemplating compressing matter to some earlier, more primitive, higher-energy state.) A leptoquark is a primordial, high energy lepton, the heaviest member of the leptonic spectrum (the spectrum of *true elementary particles* - particles with no internal components and with associated neutrino identity charges). A Leptoquark is split into three parts (quarks) by its own too-great mass and electrical self-repulsion (and the action of the "Y" IVB?). (See also: "The Origin of Matter and Information") . There is no color charge in this (leptoquark) state because the quarks are still nascent or virtual rather than real (they have not yet separated from each other), but there is a lepton number charge, and this can be carried by a neutrino ACC, the very heavy leptoquark neutrino whose presence in the Cosmos today is registered as the mysterious "dark matter". Hence proton decay is possible if we can sufficiently and symmetrically compress a baryon to its original leptoquark size, at which point a leptoquark antineutrino can cancel its baryon number charge - or it can emit its own leptoquark neutrino as an ACC, accomplishing in either case the same charge/symmetry conservation. (See: "Table of the Higgs Cascade".)

As we have noted above, compressing a baryon sufficiently and symmetrically to cause its color charge to self-annihilate requires the "X" IVB, which does not exist in the electroweak energy domain (nor its "mint"). We must travel to the GUT energy domain to find such a heavy IVB, a special press stamping out shiny new (electrically neutral) leptoquarks in some far-away country. These leptoquarks (analogs of heavy neutrons) achieve electrical neutrality simply because their internal quark composition allows such a configuration. It is these electrically neutral leptoquarks which go on to decay asymmetrically via the weak force "X" IVB, producing the excess of matter-only baryons which comprise our asymmetric matter-only universe. Hence we see the necessity for the partially-charged quarks (to form electrically-neutral leptoquarks which can live long enough to undergo weak force asymmetric decays), and the relationship between the quarks, baryons, and leptons is explained. (The necessity for three energy "families" arises because three families presents the possibility of many more (16) electrically neutral three-quark combinations.) Although obviously necessary, the asymmetric weak force decay of primordial electrically neutral leptoquarks remains a mystery, an unexplained or "given" parameter of our Cosmos, perhaps attributable only to the statistical imperative - or anthropic fiat - of an abundantly fertile Multiverse. With the excess of matter-baryons comes an equal excess of leptoquark antineutrinos, exactly balancing the baryon number of the universe, and accounting for its "dark matter" content (these are presumed to be very heavy neutrinos - perhaps as much as five times heavier than a proton).

Because the "X" IVB is so massive, in our present-day universe the only place proton decay can reasonably be expected to occur is in black holes - where, unfortunately, the reaction cannot be observed. In fact, insofar as proton decay is concerned, the main difference between a black hole and an "X" IVB is simply size. Perhaps, at least in a functional sense, a black hole is a gravitational example of a gigantic Higgs boson/IVB combination (a "gravity mint"). This would be just another instance of the gravitational metric of black holes overtaking all functions of the electromagnetic metric. Even photons become massive (since they cannot travel freely), the symmetry condition g = c means that time vanishes (because the clock stops), and all field vectors of the electromagnetic domain are converted into gravitational analogs. (See: "A Description of Gravity"). The "X" IVB is so prohibitively heavy that proton decay would be rare indeed were it not for black holes. Perhaps this is the "real" cosmic function of black holes - destroying baryons and converting them back to light (solving the "singularity" problem at the center of black holes).

Heavy baryons ("hyperons") are born in the "Big Bang" via an asymmetric weak force process; decay via ACCs to the nucleons of our ground state; join together gravitationally to form galaxies, stars, and planets, producing in the process (via the strong force) the elements of the Periodic Table. Baryons chemically create life via their electron shells and the electromagnetic force. Baryons die/decay in black holes, where they are crushed into light, eventually escaping as "Hawking radiation", the final symmetry-conserving interaction required by Noether's Theorem. "Information" is the "golden thread" running through the conservation laws governing the evolutionary unfolding of the singular feature giving significance and meaning to our universe, and providing its rationale: self-conscious life.

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