THE HIGGS BOSON AND THE WEAK FORCE IVBS (INTERMEDIATE VECTOR BOSONS): GATE-KEEPERS OF THE MULTIVERSE

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Abstract

The Higgs boson and its associated IVBs may be fairly characterized as "gate-keepers" of the Multiverse, in that they control/regulate the asymmetric products (such as our "matter only" Cosmos) that emerge from the "all-symmetric" domain of the Multiverse (i.e., the quantum-mechanical universal "void" of Heisenberg/Dirac).

I assume our Cosmos was born from the Multiverse spontaneously and a-causally, requiring no net energy or charge: charges were balanced by antimatter and/or alternative charge carriers, with positive electromagnetic energy/entropy balanced by negative gravitational energy/entropy. Time and probability are not factors in the Creation since the Multiverse is timeless and its creative potential is essentially infinite in terms of energy. (The "Multiverse" is the scientific equivalent of "God").

Conservation is the principal consideration as to what may be produced from the Multiverse: if it costs nothing, it can be created; if it can also be conserved, it can be physically produced as a separate but conjoined and interacting conservation domain (interacting in that it can be resorbed). Our electromagnetic Universe is apparently of this latter type.

The difficulty to be overcome in the creation of our separate, electromagnetic conservation domain (our universe), is simply the all-symmetric and all-conserving character of the Multiverse, which means that any matter trying to manifest (escape) is always annihilated by an exactly corresponding quantity of antimatter. Our electromagnetic Cosmos emerged from the annihilating embrace of antimatter by the creation of electrically neutral quark combinations (such as neutrons), combined with alternative charge carriers (neutrinos, leptons, mesons), and an asymmetric weak-force decay (of unknown origin) of primordial electrically neutral leptoquark-antileptoquark pairs (see: "The Origin of Matter and Information"). Primordial leptoquarks explain the otherwise mysterious relationship between the leptons and baryons (they are derived from one another), and the heavy leptoquark antineutrinos required to balance the baryon number of our "baryons only" Cosmos are excellent candidates for the "dark matter" content of our universe. The three energy families of quarks and leptons is apparently due to the necessity to produce sufficient numbers of electrically neutral quark combinations to launch our universe. There are simply many more (18x) electrically neutral quark combinations possible with three (rather than one) quark families.

During this decay process (essentially the "Big Bang"), various Higgs bosons with their associated IVBs regulate/govern the process such that charge-conserved pathways are both made available and followed, even if they utilize alternative charge carriers. The escape from the Multiverse may be asymmetric but it is nevertheless lawful in the sense that it is charge-conserving, which also means that the pathway can be retraced, if necessary. The miscreants have not "burned their bridges", they have instead left by a back door which they found ajar. Stephen Hawking discovered them returning to the void via the "quantum radiance" of black holes, fulfilling Noether's Theorem of symmetry conservation.

It seems likely that "proton decay" provides another symmetry-conserving pathway of return to the void of the Multiverse for asymmetric baryonic matter, perhaps operating (in one instance) at the extreme (and symmetric) pressure found in the center of black holes (where baryons are collapsed back into leptoquarks). If such is the case, black holes would apparently represent the cosmic solution to the difficult problem of "baryon number" conservation/balance (both at their event horizons and centers), accounting for the abundance and utility of black holes. It also seems likely this problem (proton decay) has a weak-force solution in the form of a very heavy Higgs-type boson and IVB combination (Higgs "X" and its associated IVB family), but if these do not suffice, then gravity will solve the problem in its own muscular way (via the creation of antimatter, as Hawking discovered).

We should note here that because time does not exist inside the "event horizon" of black holes, the time scale for proton decay as understood by "outsiders" (like ourselves) is completely ambiguous. Proton decay as seen by "insiders" may be immediate and explosive - another paradox associated with these fearsome and fascinating astrophysical objects. (See Leonard Susskind's book for more on this subject).

The reason why all IVBs are so heavy is that they function by recreating the energetic environment/metric in which the alternative charge carriers and elementary particles were first forged, such that every lepton is exactly the same as every other (of its type), no matter when or where it is/was/will be created - circumventing aeons of entropy. This is a necessary symmetry within the particle domain, for fairly obvious reasons of energy conservation: any electron must be able to seamlessly "swap out" with any other electron, no matter when or where either was created. This is also why IVBs must be particles (or at least "particle-like"), as particles are immune to the enervating effects of cosmic expansion.

The Higgs and its IVBs are "gatekeepers" indeed, ensuring that every elementary particle within our electromagnetic 4-D domain conforms precisely to type, so that it may both function properly and be recycled/conserved/balanced efficiently. There are no "lost sheep" wandering aimlessly in this fold. This is why the weak force "Identity" charge is so important to the conservation of our system - *a conservation domain within the Information Field that is of equal importance to energy.*

The Higgs may be thought of as both a gatekeeper for the Multiverse, and a gateway to the subset that is our electromagnetic Cosmos. While we don't know how many different electromagnetic universes are actually possible (with different values of "c" for example), we do know that ours has a very special characteristic: it can (and did) escape the all-symmetric (and all-annihilating) maternal embrace of the Multiverse to manifest its own unique, if imperfect (because asymmetric) identity. (It is easy to see how this ontogeny is reflected in the Genesis allegory of the all-symmetric Garden of Eden, with the weak force in the role of the serpent and the Higgs as the forbidden fruit).

But what features does a "standard issue" electromagnetic universe come with (features that are "given" without explanation), and how did ours escape the Multiverse? In addition to a 4-D metric (spacetime, as gauged by the electromagnetic constant "c"), we find massless, electrically neutral "light" and three electrically charged elementary particles (the massive "leptons": electron, muon, tau - always in particle-antiparticle pairs), accompanied by their (nearly) massless neutrinos, which serve as their crucial alternative "identity" charges (allowing, in the proper circumstances, both manifestation and eventual conservation). However, if this were all there is, such a universe could not manifest, as it has no possibility of escaping annihilation, having no electrically neutral massive particles. But in our realized universe, we also find baryons, heavy composite particles composed of three quarks (the nuclear particles of atomic matter). Because baryons are not elementary particles, they require some explanation; we cannot accept them as simply "given". Baryons are too complex, they must have a history (an "origin story"), and that history must be crucial to the process of manifestation.

The "story of baryons" is a tale we must reconstruct by "reverse engineering": how did we get from the symmetric "leptonic universe" to the asymmetric universe of leptons and baryons (atomic matter) we inhabit today? We do so by simply extending the "leptonic spectrum" (electron, muon, tau) to include a 4th and heaviest member, the "leptoquark", which we assume must have existed abundantly during a suitably early, hot, and dense developmental era of the "Big Bang".

As its name suggests, the leptoquark is a heavy (highly energetic) lepton which is internally fractured into three subunits, the so-called "quarks". The leptoquark is the natural terminus of the leptonic spectrum, as it is so heavy that it seeks and finds a lower energy solution to the problem of existence and the self-repulsion of its own electric charge - by dividing itself and the charge into three lesser subunits, the quarks, which bear both positive and negative fractional electric charges (charge subunits of 1/3, 2/3). This also opens the spectacular possibility of creating an electrically neutral composite heavy baryon (like the neutron), which will be susceptible to a slow weak force decay with the emission of a leptoquark antineutrino (balancing the identity charge). If this decay is asymmetric for any reason (such that more antileptoquarks decay during a given time period than do leptoquarks), then we are well on our way to our present asymmetric "baryons only" cosmos. (We still don't know exactly why this asymmetry exists in the weak force, but it obviously must exist or we wouldn't be here to wonder about it.)

Note that this "history" also explains the origin and character of the "short-range" strong force between quarks as well as the relationship between the quarks, baryons, and leptons. The three energy levels of the quarks and leptons are understood as a quest for more electrically neutral quark combinations: the whole "manifestation enterprise" for our universe turns upon achieving sufficiently many electrically neutral composite massive particles (such as the neutron and/or its heavier analogs). Finally, our "reconstruction" provides a strong candidate for the identity of "dark matter" (heavy leptoquark antineutrinos), one for every baryon in the universe.

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