The Higgs Boson and the "Leptonic Spectrum"

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Abstract
The conservation role of the Higgs boson is the creation of the "Leptonic Spectrum".

Note to reader: What follows is my personal understanding/interpretation of the data of the "Standard Model" of physics. It is not the same in all respects as that found in textbooks, but it will be (I believe) within reasonable bounds. The "leptoquark", for example, is hypothetical, and there is no math in my papers. See: "The Higgs Boson and the Spacetime Metric" for a discussion of further differences between my own and the "Standard Model's" conception of the Higgs Boson's conservation role.

The charged weak force IVBs (W+, W- Intermediate Vector Bosons) weigh in at approximately 80 GeV; this is the energy required (equivalent to about 80 proton masses) to create a *single* new electron or positron (not a particle-antiparticle pair, which can be had for very much less). A W neutral (Z zero) is even more massive, about 91 GeV; this is the energy required to create a *single* new neutrino, which weighs much less even than an electron. The reason for the huge mismatch between the rest energy (e = mcc) of the electron and the neutrino, and the energy required to create them as *single* particles, has been attributed to the difficulty/necessity of creating them exactly like all others of their kind ever produced - a difficulty which is moot in the case of particle-anti-particle pairs (since these can immediately and certainly annihilate each other with no threat to symmetry/energy conservation). This difficulty is thought to be resolved by returning to the original high energy at which these leptonic elementary particles were first created in the primordial heat of the "Big Bang" - which the great mass-energy of the IVBs recreate.

The next (and last?) particle in the energetic series of these strange, heavy weak force particles is the "Higgs boson", weighing-in at about 126 gev. This is a scalar particle, not a vector-boson like the Ws or Z. So despite the "ball-park" similarity in mass, the Higgs is a radically different particle in terms of function. The IVBs carry or transfer the weak force; the Higgs "gauges" or "scales" the convergence of the electric and weak forces, encompassing also the IVBs. The IVBs are active, the Higgs is static. The Higgs identifies the energy level at which the electric and weak forces join (creating the combined "electroweak" (EW) force. This distinction is important because there are at least two other "force-convergence" energy boundaries above the EW confluence, the "GUT" ("Grand Unified Theory") convergence at which the strong force joins the other two (creating baryons), and the "TOE" ("Theory of Everything") threshold at which gravity joins the other three (creating leptoquarks and spacetime). Each

of these high-energy force convergences is assumed to have its own uniquely distinguishing "Higgs-like" scalar particle (a boundary or threshold marker for each "force-unity energy plateau" or "symmetric energy state"). (See: "Table of the Higgs Cascade".)

Below the Higgs electroweak energy scale (and below the primordial energy scale of the IVBs at which lepton identities merge (among themselves) and quark identities merge (also among themselves - but leptons and quarks remain distinct), we find our own more familiar electromagnetic (EM) "ground state" energy domain of atomic matter, with its own distinct energy levels of electron shell (chemical energy) and nucleus ("atomic" or nuclear energy). The interior of our sun and stars only begins to approach the primordial electroweak (EW) energy threshold because of the copious nuclear transformations (fusion/fission) and IVB activity ongoing there, but even these energies are not sufficient to completely liquify an atomic nucleus. The EM energy regime is preeminently the domain of *Information* and (in its chemical sector) biology. Biochemical life is probably common throughout the Cosmos.

But we want to know what the Higgs boson is "good for"? What is its function, what does it do, why must it exist? We know what the IVBs do and how they function - they transform/create *single* elementary particles and they do so by revisiting the original (primordial) energy levels at which these particles were first created during the early micro-moments of the "Big Bang". Their function is one of symmetry and energy conservation: all elementary particles must be exactly alike in all conserved attributes (charge, spin, mass, etc.) so they can seamlessly replace one another in any reaction (including matter-antimatter annihilation reactions) - and this regardless of when or where they are/were created. This is a tall order, considering the ongoing spatio-temporal entropic expansion of our 14 billion-year-old universe. This entropy problem requires the weak force elementary particle transformation mechanism to return to its primal origins, via the great mass of the weak force IVBs (which act like time machines), impervious to the enervation of entropy because they are *massive*. All electrons are exactly alike because they are all made from the same mold at the same temperature, via the IVBs.

The Higgs scalar boson also plays a major part in this complex conservation scenario: the Higgs defines, scales, gauges, and identifies an EW conservation domain in which the weak and electric forces merge their energies (and properties). The electromagnetic force is primarily a spatial action force of attraction and repulsion (electric charge), and of spatial entropic expansion and the spatial transfer of pure energy (the "intrinsic" motion of light). The weak force is primarily a force of *information* whose basic charge is *identity*. Putting these two forces together provides the possibility of energy, symmetry, and identity conservation in a spatially extensive and causally connected domain (because energy quanta can be identified, moved, and hence exactly reproduced and/or annihilated). The principle example of this fertile force combination is the elementary "*Leptonic Spectrum*" (electron, muon, tau, leptoquark), in which massive electrical particles (quanta) are combined with weak force "identity charges": neutrinos are the explicit, "bare" forms of weak force "identity" charge, and each massive lepton is associated with a neutrino of its type, plus a corresponding but "implicit" identity charge of its own (AKA lepton "flavor" or "number" charge). (The leptoquark is hypothetical, but we need it to join the leptons and baryons).

Through the "Leptonic Spectrum", the Higgs identifies and "gauges" the EW conservation domain of spacetime, which essentially comprises our entire, vast "post-Big Bang" Cosmos (hence the Higgs has been called the "God particle"). The Higgs is saying: I am the energy level at which a combined dimensional and karmic (cause and effect) conservation domain is possible for these forces/energies, complete with IVBs (both charged and neutral) for the transformation of elementary particle identity and the foundation of an information empire built upon an asymmetric, temporal, local, matter-only

alternative energy form (atoms). The Higgs boson is a primitive artifact of our asymmetric universe, identifying a conservation pathway for massive forms of asymmetric atomic matter: the EW conservation domain, replete with time-traveling IVBs and the leptonic spectrum of elementary massive particles they faithfully sustain and reproduce. The Higgs is responsible for creating the "Leptonic Spectrum"; the IVBs are responsible for accurately replicating it over time and space. All the rest, as they say, is entropy and information.

Leptoquarks and Baryons

It may appear to the reader that I have overlooked the most important feature of the material world - the three-quark baryons (protons and neutrons) which form the foundation of our atomic realm and the Periodic Table. We will consider them next, including the all-important question of their relationship to the leptons. It is my assumption/belief that baryons and the quarks that comprise them are related to leptons through derivation: the baryons are nothing else but primitive, heavy leptons subdivided into three parts, which are held together by internal "unitary symmetry debts" (the gluon field), because Nature will not tolerate a free-roaming fractional electric charge (quantum mechanics forbids it because there is no way to conserve this sub-level of broken symmetry (fractional charges cannot be balanced or canceled or annihilated by other free-roaming fractional anti-charges - since none exist). This assumption immediately explains all the characteristics of the strong force color charge and the otherwise mysteriously serendipitous and much-too-convenient relationship between the leptons and baryons. They are related through the leptoquark, the last and heaviest member of the leptonic spectrum, a primitive lepton so massive that it finds a lower-energy solution to the self-repulsion of its own electric charge in the internal fractional charges of quarks and associated gluon exchange field. Gluons permanently bind quarks into whole quantum unit charge packets (baryons or mesons). Baryons are composed of three quarks, mesons of a quark-antiquark pair. The too-massive leptoquark brings a natural closure to the energetic "leptonic spectrum" of elementary particles (just 4 species of elementary leptons (if we include leptoquarks but ignore neutrinos) for the entire universe!). Leptons are the only class of elementary particle, and are so distinguished by their neutrino identity charges: sub-elementary quarks have none. The (hypothetical) heavy leptoquark neutrino is an obvious candidate for the "dark matter" of the Cosmos. (The (unrelated) mystery of "dark energy" is discussed in another paper.)

Postscript I

The Higgs is necessary in that it marks the combining energy threshold of the electric and weak forces, and the creation thereby of the "Leptonic Spectrum" of elementary massive particles, from the electron to the leptoquark. So we are saying the Higgs is responsible (directly) for the creation of the leptons, and these in turn are necessary to produce a conserved, alternative, massive, local, causal (temporal) universe from the asymmetric energetic remnants of the "Big Bang". It is the leptoquark, in fact, which (in concert with the asymmetric action of the weak force), causes the original "Big Bang" symmetry-breaking, for the fractional charges of the quarks allow the creation of electrically neutral baryons (like neutrons), which are susceptible to weak force asymmetric decays (because they are so long-lived).

For those who are interested in the convergence between science and religion, it is quite easy to see all the ingredients of the Genesis creation myth in this parallel scientific creation story: the tree of life is the leptonic spectrum; the evil serpent is the asymmetric action of the weak force; the proffered apple is the innocent-looking electrically neutral baryon; the Garden of Eden is the unbroken symmetric energy state of light, before symmetry-breaking; the casting-out is into the broken symmetry of the realm of massive atomic matter, penalized by time, gravity, charge, mass, and local immobility (not to mention death and taxes). The angel with the flaming sword is electric charge, really mad about being tricked by the fractional charges of the quarks, which are consequently locked away permanently.

We live and move and have our being within the Electroweak Conservation Domain, made possible by the Higgs Boson combining the electric and weak forces, producing the Leptonic Spectrum, with subsequent weakforce symmetry-breaking of electrically neutral leptoquark-antileptoquark pairs, producing our asymmetric, "matter-only" universe as an alternative energy form conserved by the law of charge conservation: *the charges of matter are symmetry debts of light*. Once stability is reached within the asymmetric "matter-only" atomic system so created, information building can proceed, producing first the Periodic Table of the Elements and eventually life, consciousness, abstract thought, and technical understanding. The Cosmos awakens to itself. Life is the rationale for the Cosmos. Without doubt, life is everywhere throughout our universe. (A major philosophical question remains: does life exist on larger scales than our own? Is our planet ("Gaia"), solar system, galaxy, or indeed the Universe itself "alive"? Does the fact of our individual life confer "generalized life" upon these larger (and demonstrably necessary) organized systems that contain and support us? Are we but "cells" within a larger living entity?)

To be clear, we should say that we live within the planetary and biochemical sector of the information realm of atomic matter, in the electromagnetic ground state of the electroweak domain, as gauged by the Higgs boson from primordial times. Of the Leptonic Spectrum, only the electron and the leptoquark (now in the form of protons/neutrons) significantly engage our daily lives, although their neutrinos play an important but unseen (charge conserving) role. Nuclear forces (strong and weak) are at work in our Sun, providing heat and light for our negentropic and information-building lifestyle. Our Sun is the archetype of symmetry conservation, converting bound electromagnetic energy (mass) to free electromagnetic energy (light), while simultaneously taking the first step along the information pathway that leads to the Periodic Table and eventually to life (creating helium from hydrogen). Within our Sun, too, the IVBs of the EW domain are busy converting one elementary particle into another, but the IVBs are as close as we will come to the primordial energies of the Higgs itself. The EW domain established by the Higgs boson encompasses everything in our Cosmos created after the "Big Bang", with one notable exception - the "black hole". This gravitational estate in which time itself stands still, remains a profound mystery, in that we don't know what it is composed of. If there is an alien visitor from another universe within our spacetime, it can only be the "black hole" (abducting our stars for its own energy reserves?). I discuss these truly bizarre states of negative energy, including their conservation role, in the gravity and entropy sections of my website. See: "Introduction to Gravity" and "Introduction to Entropy". (See also: "Overview of the System" and "Alternative Charge Carriers and the Higgs Boson".)

Returning to the question of the strong force: the "Leptonic Spectrum" takes account of the strong force only through the notion of the (hypothetical) leptoquark. Is this a sufficient treatment? Yes, because of the peculiar nature of this force (Gell-Mann "color" version) which is entirely "bottled-up" within the baryon itself, having no presence in the outside world. The binding of compound atomic nuclei is entirely due to the exchange of virtual mesons (Yukawa strong force mechanism), the color charge "gluons" playing no part. What then does the strong force color charge do? Of course it binds quarks permanently within baryons, and holds mesons together (apparently). But beyond the permanent "confinement" of quarks within baryons (thankfully shielding our eyes from the hideous, asymmetric sight of fractional charges), the main effect of the strong force color charge is simply the creation of "mass": only the binding energy of gluons makes a baryon "heavy". So the Higgs has nothing to do with the mass of the quarks or baryons, nor, by extension, has its creation the "Leptonic Spectrum". It's all binding energy in the case of the color-charge strong force, leaving the field of mass effects entirely to the primordial convergence energy of the electric and weak forces - the "spatial action" force and the

"information" force. Hence the "Leptonic Spectrum" does not have to encompass or account for the masses of quarks or baryons, including, of course, the anomalously huge mass of the "top" quark. The "Leptonic Spectrum" is some sort of "harmonic resonance", which the masses of the baryons and their quarks need not disturb.
