

## Identity Charge and the Origin of Life

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*The charges of matter are the symmetry debts of light - "Noether's Theorem".*

"Identity" charge (also known as "number" charge) is the fundamental charge of the weak force and the most important of the particle charges. Identity charge is the symmetry debt of light's anonymity, or complete lack of identity. One photon cannot be distinguished from another, but the elementary leptonic particles are distinct from photons and from each other, and hence carry identity charges. Neutrinos are the explicit or "bare" form of identity charge, which is also carried in a "hidden" or implicit form by the massive leptonic elementary particles - electrons and their heavier kin. Single elementary particles cannot enter or leave the 4-dimensional realm of manifest reality without a conserving identity charge - the functional equivalent of a human "soul" or a citizen's passport. The utility of identity charge (in terms of symmetry conservation) is to facilitate particle-antiparticle annihilations by helping particles identify their appropriate "anti-mates" in a timely fashion - ensuring a conserved pathway for elementary particles returning to their original state of symmetry (light). For more on the function of identity charge see: ["Identity Charge and the Weak Force"](#), and ["The Origin of Matter and Information"](#).

A significant trend in the sequence of the [fractal hierarchy table](#) is the development, both from left to right and top to bottom, of system "identity" in progressively large, complex, and sophisticated forms. While this is most obvious (to us) in the evolution of the biological realm, its beginnings should not be overlooked in the preceding microphysical realm, nor its growth throughout the succeeding astrophysical realm. Each line (except the first - but see: ["The Higgs Boson and the Weak Force IVBs"](#)) begins with a unit whose identity was formed at the previous level; indeed, the formation of this unit identity is the whole thrust and goal of every line. The condition of identity is congruent with the formation of the membrane or boundary condition which defines and defends the unique end state or "emergent new unit" of each line. In its horizontal development, the new identity first discovers its "mate", opposite number, or complementary unit (column two, "Pair"). Biologically, this stage of enlarged identity results in the reproduction/replication of similar dyads, which are themselves reproductive units. This recognition of "complementarity" or "mate" begins in the very first line of the microphysical realm, with the dichotomy of space and time, light and matter, particle and wave, matter-antimatter charge and spin particle pairs, electric and magnetic, etc., and continues through the atomic, crystalline, and molecular levels to functionally replicating DNA at cellular level 5. It goes on through the familiar levels of the biological realm to continue into the planetary, stellar, and galactic levels, ending as it began in the "Universe-Antiuniverse" pair of matter-antimatter at the "Multiverse" final level. (See: ["The 'Higgs' Boson vs the Weak Force IVBs: Part I."](#))

The third or "group" column is the site of the 4x3 fractal algorithm. This is the seat of "system" function, the "social metric", the "sharing of differences". It is here that the identity of the unit or the pair must be submerged and subsumed into the new and larger group or "system identity". At the human level with which we are most familiar, it corresponds to the individual and family becoming submerged into a larger political/religious identity of "society", such as the tribe, clan, or nation. The proton and electron find themselves members of a large compound nucleus and electron shell which modifies their energy and behavior; at higher levels they become members of a crystal lattice, and finally an interactive molecular system involved in various "work" functions: cyclic energy capture, storage, transfer, or replication. In the biological realm, chemical systems, organelles, and symbionts merge their separate functions and identities into coordinated cellular activities; cells give up their individual identities to the specialized system functions of an organism; individuals function in societies in various specialized and subservient ways, and species play various roles in the functioning of ecosystems. Humans, for example, function as the galactic dispersal agents or seeds of Gaia, the collective identity of Mother Earth.

If the unit recognizes a copy or variation of itself at the pairing level, we can understand (at least intuitively) the basis of the attraction. But what is it that the unit recognizes at the group level that induces it to join the collective and sacrifice its own identity? What is the basis of the social attraction? Two answers

immediately suggest themselves: 1) safety in numbers/size; 2) efficiency of function through specialization. Both confer advantages, but only within a competitive environment. There are also certain benefits to size and numbers that are simply "emergent properties" of large organizations, efficiencies of scale, etc. An individual human cannot create a 747 jumbo jet, or mount an expedition to the Moon, but a large society of humans can. As Lenin is purported to have remarked: "Quantity has a quality all its own". We see all three benefits operating in the human body as compared to the single cells of which it is composed. Although our bodies are composed of many billions of cells, each with its own complete set of DNA in its nucleus, all have given up their own individual identities to the greater system identity of the human individual. Cancer results when cells reassert their individual identities and overthrow the system controls which keep them subservient to the interests of the larger organism; the analog in human society might be a criminal or revolutionary organization.

The evolutionary step from single cell to organism is the hardest because cells must somehow be persuaded to sacrifice their own identity for that of a higher level of organization which none of them can directly experience - much as a soldier must somehow be persuaded to sacrifice his individual life for the life of the Nation. It took far longer in the evolutionary history of Life to evolve multicellular organisms than it did to evolve single-celled life forms from the physical elements. Most of the history of life on Earth is the history of single-celled forms. This is perhaps because single cells actively opposed sacrificing their own identities to form a multicellular system, whereas no such specific opposition existed to delay the formation of the first single cells. In this regard, the alternative pathway of symbiosis or mutualism should be noted, in which cooperative cells or organisms do not completely lose their individual identity. Chloroplasts and mitochondria are apparently the remains of symbiotic cells which successfully integrated with the larger multicellular system but retained much of their own reproductive mechanism and identity.

When one realizes that the "system" pleasures that a human individual can experience, such as the beauty of a symphony or a sunset, are nothing that a single cell can even remotely "comprehend" or experience, we get a sense, on the one hand, of what is meant by an "emergent" property of scale and complexity; on the other hand we must wonder if the pleasure we take at the organism level is in any way shared by the cells whose sacrifice of individuality makes it possible. Furthermore, are these emergent properties purely serendipity, or are they in any sense "intended" or anticipated outcomes? But we recall the point made above regarding safety, efficiency, and specialization in a competitive environment with limited resources. These factors alone will eventually lead to multicellular organisms. We have also noted this evolutionary development takes place along a fractal pathway of self-similar organizational structures and functional systems.

There are certain "whole body" sensations (sexual orgasm comes readily to mind) in which one can imagine that all the body's cells participate and "experience" some of the pleasure (or distress) of the larger system. Emotional pleasures (or pains), some aesthetic pleasures, love, heartbreak, jealousy, fear, panic, rage, hunger, thirst, shock, sickness, drug addiction, etc., seem to be of this "whole body" type of experience, in which all or many of the body's cells participate and somehow share the experience of the whole system. In an analogous fashion, I can experience vicariously some of the thrill, fear, triumph, and tragedy of space flight, because I am a member of a larger, coherent system (society/species) which sends astronauts to the moon, even though I as an individual can never go.

There is another point of view regarding the "group" column which returns to the main theme of identity. Suppose the third column with its 4x3 fractal algorithm is simply a reprise of the pairing function of column 2 but at a more sophisticated and complex level of identity? In such a case the attraction is again the recognition of identity but in a 4x3 form rather than a simple polarity, twin, or "complementary" form - identity not only in the sense of personal identity as in column two, but identity in a broader but equally fundamental sense, such as the kinship we feel with our society, territory, or nation - our national identity or "patriotism", for example. The identity we recognize in this case is that of the 4x3 fractal resonance: when we feel or come into the resonance, the "good vibes" tell us we are "home" in a fundamental and Universal sense. The panic of "homesickness" recognizes the loss of this larger system identity, a higher system analog of "love sickness", the loss of pairing identity at the previous stage. Fractal resonance is precisely the meaning of "as above, so below", "man in the image and likeness of God", "man the measure of the Universe". The identity we recognize in the 4x3 algorithm is not simply our own, but our own enlarged and

enhanced in the general identity of the Universal fractal. It is the opportunity to experience and participate in this larger system identity which calls us into social participation, where we are enabled to fulfill a greater individual potential and identity than we ever could have alone or at home. *"What do you want to be when you grow up?"* This question, asked of all children, recognizes the inevitable developmental call to a mature, enlarged, social identity.

Below I briefly review the chain of 4x3 fractal resonances leading into and prefiguring the form of the biological realm. I begin the list (arbitrarily) with:

- 1) Four conservation laws connected in triplets: the "Word" or "[Tetrahedron Model](#)" of conservation law.
- 2) These manifest as the four forces (or charges) of physics and three particle classes: leptons, hadrons, and bosons. The 4-dimensional metric of spacetime is an intimate and fundamental part of this conservation domain, created by three entropy drives or "intrinsic motions": light, time, and gravity.
- 3) These further devolve into the 3 energy families each of 4 elementary particles.
- 4) These decay to the ground state baryon (proton), 3 quarks x 4 charges (electric, color, flavor, spin).
- 5) Next comes the nucleosynthetic pathway and the alpha particle (helium nucleus - 4 nucleons x 3 quarks) followed by
- 6) The carbon atom, with its 3 nuclear 4x3 resonances (3 alpha particles each of four nucleons). Carbon also contains
- 7) A 4th 4x3 resonance in its electron shell (4 valence electrons in the 3rd shell). (No other element in the periodic table has such a series of 4x3 resonances in both its nucleus and electron shell - and there is more...)
- 8) In the succeeding level of molecules and crystals, we have the tetrahedral molecular bonding pattern of carbon - an astonishing 5th 4x3 resonance for this atom (4 triangles), producing the diamond crystal and more importantly, "organic" chemistry. (Significantly for the evolution of life, water also produces tetrahedral molecular bonds.)
- 9) At the 4th microphysical level we find RNA/DNA with its 4x3 molecular structure (4 nucleotides each composed of 3 chemical groups - sugar, phosphate, nitrogenous base).
- 10) In the cell, we find a final 4x3 resonance in the genetic code of all biology - 4 nucleotides code in triplets to produce the amino acids of proteins.

The reason I mention all these links in the fractal chain is to drive home the point that when one 4x3 RNA/DNA molecule mates and replicates with a complimentary 4x3 partner, this is not a meeting of accidental monstrosities, or an incredible serendipity, but a "coming home" to a 4x3 resonance pattern which is really a more universal and general extension of the simple pairing pattern of column two. The third column is the seat of our universal identity, the 4x3 fractal algorithm, General System, or cyclic pattern of the Cosmos - the "Word" or "Tetragrammaton" which preceded creation and gave it structure, the archetype of identity, the Logos and hidden identify of the first cell of row one, Light and the metric of spacetime.

Why 4x3 and not some other algorithm? Because 4x3 is (evidently) the simplest metric or pattern of sufficient complexity that can do the job of symmetry-breaking in the primordial "Creation Event" or "Big Bang" - bringing light into manifestation via the asymmetric weak force decay of electrically neutral leptoquarks. Matter is only as complex as it needs to be to break the primordial symmetry of light's particle-antiparticle form during the "Big Bang". (See: "[The Origin of Matter and Information](#)".)

A final significance is for the origin of life - life is not a random event, because of the central role played in the origin of life by carbon and its 4x3 metric. In the terms of "Chaos" theory: the 4x3 algorithm or General Systems resonance represents the "fractal basin of a strange attractor". Carbon is a very abundant element in the Universe, and water is a very abundant molecule; life is a 4x3 resonant form produced by carbon and water and hence not a chance occurrence - therefore we can expect carbon and water based life and perhaps even DNA-based life to be common in the Cosmos - at least at the single cell level of evolutionary development. (See also: "[Newton, Darwin, and the Origin and Abundance of Life in the Universe](#)".)

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## **References**

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