

E.D. Briefs.

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How Is It That

Deep, Qualitative, Ontological Change

Is Possible At All in Our Cosmos?

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for

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Omni-Copyright Statement. This text is a *partially self-exemplifying exposition of, & a record of an ongoing self-critique of, the ideas advanced herein.* The 'ideo-system' behind it is a "'meta-dynamical'/'meta-evolving'" conceptual object. The time sequence of changes in the form/content of this text is predicted to be both an illustration and an instantiation of the 'meta-model' of '[ideo-]ontological meta-dynamics' that this text explores, as well as of the 'homeomorphic defect' of that 'meta-model'. We expect that successive editions of this document will document an 'ideo-onto-dynamiasis' rather than an 'ideo-onto-stasis', a 'meta-evolving ideo-ontology'; a 'multi-meta-ontic, multi-meta-monic ideo-cumulum'; an expanding, and ever "'thickening'", increasingly 'inter- & intra-connected', "'inter-acted'" network of 'inter-implicatory', 'inter-determinate', 'inter-generative' ideas, elaborated upon a mounting count of 'meta-finite', 'meta-fractal' scales, all exemplifying a 'non-standard', 'contra-Boolean logic'; the ontologically dynamical logic of the dialectical "law" of cognition signified by the 'ideo-ontological', "purely" -

qualitative, Q-algebraic inequation -- $x^2 \neq x$

This work is a potential contribution to the collective creative property of the Terran human species: assimilate, disseminate, critique, *and surpass* at will. The author seeks hereby to further neither his monetary riches, nor his public power, nor his personal fame. What he wants, money cannot buy. He hopes, with your help, to build a better self, and to help to do his "'infinitesimal"' part in building a better universe ["infinitesimal" differences can matter, as nonlinear dynamics demonstrates]. More monetary wealth will not buy that betterment. More political power cannot impose it. More fame would mainly distract from it. He hopes that you have chosen, or will choose, to build a better you. He holds that this choice entails the profoundest consequences for one's life, as well as for the lives of others. He also holds that such choices belong to you alone. He wishes to share, with you, the forthcoming conceptual riches. He will rejoice, and he will be compensated, if you teach him in turn, help him to correct his errors, and thus advance the common-wealth of all beyond this offering. He also requests your forgiveness in the areas of his many shortcomings, some of which, though determined to strive ceaselessly to overcome them, he will not be able, in a lifetime, overcome. The author is not publicly accessible, but will endeavor to provide private transmittals to you if you indicate publicly, however cryptically -- and he recommends that it be cryptically -- your desire that he should do so. He wants not that his existence, let alone his ego, should be an impediment to that great reverberating propagation of new cognitions, and of emerging new kinds of cognition, of which this text is, at best, an incomplete, imperfect, transitory, and transitional manifestation. He therefore happily foregoes personal credit, except, of course, to his pseudonym, and, by thus renouncing in advance the [remote] possibility of any notoriety resulting thereby, hopes also to retain more lifetime for the continuation of this work. Dialectical ideography as set forth and/or applied herein is interpreted variously as --

- (0) a dialectical-ideographic language; dialectical mathematics; or mathematics of dialectic, for mathematical «mimesis»/'mimesis' of the 'meta-monic' «aufheben» "'dialectic of Nature'" as Totality;
- (1) a calculus of qualo-quantitative change, encompassing an explicit, ideographical arithmetic for the dimensional unit[ie]s or metrical "monads" of classical "dimensional analysis", and, thereby, 'semantifying' the "meaningless" singularities [zero-division-induced, finite-time "infinite" values] of especially the "unsolvable" [in part, because of those very singularities] nonlinear integrodifferential equations and their solution-functions, via their metrical 're-qualification' using those new, explicit 'metrical qualifiers' of this 'dimensional arithmetic', concretizing and operationalizing Plato's «arithmoi monadikoi» & Diophantus's M;
- (2) an alternative, onto-logical, contra-Boolean algebra;
- (3) an ideographic, 'onto-dynamical' "symbolic logic" for the state-space/control-parameter-space, or 'state/control meta-space' "'meta-dynamics'" of 'meta-finite', [self-]conversion-singularity self-bifurcation;
- (4) a mathematics for modeling the history of mathematical ideas as well as a [psycho]historical algebra and arithmetic for modeling the "'meta-evolution'" of the sciences generally; an ideography for the [psycho]history of ideas; an ideography of the "'meta-dynamical'" logic of conceptual self-innovation and self-development; a 'philosophical algebra' /trans-Leibnizian, dialectical «characteristica universalis»; an arithmetic/algebra of innovative conception; of creative conceptual process;
- (5) a rules-system for an ideographical language of qualitative, ontological self-escalation in concretely self-transcending [meta-][superⁿ-]systems;
- (6) a generic algorithm for the 'meta' operation regress; for a trans-Hegelian, 'autopoiesic' version of the «aufheben» operation; and for a "dynamical", 'temporalized', diachronic, "'meta-evolutionary'" version of the Russellian/Gödelian "logical types hierarchy";
- (7) a model for a 'meta-fractal', 'contra-Cantorian theory of [sub-]totalities, of 'meta-finite' arithmetics, and of the "foundations" of mathematics;
- (8) an arithmetic, algebra, geometry, & analysis built upon certain "non-standard natural numbers", i.e., upon the 'Gödelian meta-natural meta-numbers', a space of non-Musean "hypernumbers", 'of 2nd degree', 'made up out of "standard", '1st degree' "natural numbers", 'instancing' those "non-standard models of 1st order Peano arithmetic" implied by the 1st-order conjunction of Gödel's completeness & incompleteness theorems, as by the Löwenheim-Skolem theorem, yielding thereby an 'ontologically dynamical', 'de-Parmenideanized', 'de-idealisticized' actualization of Plato's "arithmetic for dialectics", his "'assemblages of idea-monads» or of «idea-units'" -- his «arithmoi ideagikoi».

This treatise, in addition to that of 'ideogramic', 'pictogramic', and 'phonogramic' symbolization, draws also upon the power of neo-mythological, allegorical, and mythopoeic — that is, of "'psychohistorical'" — symbolization to aid in the conveyance of its most urgent messages. Thus, everything about the Foundation is symbolic. Not just the Ideographies. Everything. The author leaves it to the reader to decide what about the Foundation is "'meta-fiction'", versus what is real, as a test of the reader's discernment. Dialectical ideography is, he believes, a humble but potent seed. As with the several non-Euclidean geometries that arose from the failed attempts to prove the absoluteness of Euclid's geometry, these non-Parmenidean, 'contra-Boolean', and 'contra-Cantorian', "'onto-logical'" and 'onto-dynamical arithmetics' and their algebras of dialectics may bear fruit for humanity only if germinated through the intra- and inter-personal dialogue, and dialectic, of assimilation, critique, refutation, and supercession. Taking to heart the ideas "graphed", 'pictographically', 'ideographically', & narratively [phonogramically], herein, can produce profound transformation in the very identity of the person so taking. Panic in response to perception of the early signs of such transformation by other perceivers of such transformation may elicit, from some of those perceivers, a violent reaction. In particular, intimations, herein, of the 'meta-human' -- Δh -- implications of the 'cumulum' of human[oid] [meta-]evolution is profoundly disturbing to some. The author therefore lodges this all-persons Omni-Copyright statement as containing also a countervailing caveat: he recommends that you disseminate the ideas of this document, &/or related ideas of your own discovery, with careful judgment. Give the friends of humanity a head start vis-à-vis their adversaries. The systems, of dialectical ideography glossed herein continue to evolve & to "meta-evolve" rapidly in our research. They burgeon beneath our feet. Dialectics should inculcate humility. "Perfection" is not a final "'meta-state'" that can be finally manifested, but an open-ended, 'uncompleteable', asymptotic process, moving from greater to lesser imperfection. The author realizes that conceptual 'homeomorphic defect' is inescapable for cognizing beings such as ourselves. Even at best, one must always be partly wrong. Even at best, one cannot be finally, completely, & wholly right. One's mental constructs cannot ever be the truth, the whole truth, & nothing but the truth. But one may be right enough for one's time, for one's moment, for one's role, & for one's part; right enough to help one's contemporaries to live through, & beyond, one's time, that they thus, potentially, might enjoy the privilege, the pain notwithstanding, of a vital ['life-ful'] & willing participation in the succeeding epoch of imperfection.

How Is It That Deep, Qualitative, Ontological Change Is Possible At All in Our Cosmos?

by Karl Seldon. [NOTE: Standard E.D. edits have been applied to this text by the E.D. Editors, Special Council for Encyclopedia Dialectica.]

Preface. How is it that *deep change*, qualitative change, ontological change -- the *irruption and accretion* of *new ontology* to *our reality* -- is *possible at all* in *this cosmos*? What *answer(s)* in *response* to *our reflections* upon this *question* does the “dialectic of Nature” give back to *us*? *These* are the *questions* that *we address herein*.

Background. It *might* be easier for *us*, given the *nature* of the ‘human phenome’ of *our times*; of the “psychohistorical” *background* that *we all* more or less *have in common*, to *imagine* “purely” quantitative change alone, and *even* to *imagine* this *kind of change* to be the only kind of change that is *fundamental* to *our cosmos*.

An *example* of *this kind of change might* be the *motion* of the *center of mass* of a *given three-dimensional finite-volume body* for *so many centimeters* in *some direction away* from *its earlier position*, and with a “*constant speed*” of *so many centimeters units* of *spatial motion* “*per*” [during one] *second unit*.

Another example might be the *replications* -- the *self-replications* -- and [self-]*terminations* of *populations* of *units* of *some kind*, leading to *increase*, or *decline*, or *even* [near] *stasis* in the [average] *count* of *such units extant during each unit* of *time*, or *even* to extinction when such *counts* touch *zero*.

We might find it *next-easiest* to *imagine* what I will call “Darwinian change”. This *kind of change encompasses growths and/or declines* of *populations* of *units* -- or, to *use our* ‘[Meta-]Pythagorean terminology’, *growths and/or declines* of «arithmoi» of «monads» -- *driven* by *their relative “fitness”* [“fitness” to ‘*sustainedly*’ *self-reproduce*], and thus including *changes of kinds*, *emergences of new kinds*.

However, such *emergences* are *confined only* to the *limited, biological*, DNA-based, *Darwinian sense* of, e.g., *cell units* [re]producing more or less of a *count* of *themselves*, but also sometimes producing *new kinds of cells*; of *multicellular organism units* [re]producing more or less of a *count* of *themselves*, but also sometimes producing *new kinds of multicellular organisms*. This *Darwinian kind of change never encompasses*, e.g., ‘*meta-genomic processes*’ of *even still-biological change*, e.g., the “*sybiogenesis*” & “*endosymbiosis*”, by which pre-eukaryotic or “prokaryotic” *living cell units* gave *birth* to the *first* “eukaryotic” *living cell units*.

There is, *however, one* “Darwinian” *principle* that *bridges* ‘*meta-genomic processes*’ -- *both* ‘*pre-genomic*’ and ‘*post-genomic*’ *processes* -- of [meta-]evolution. *It traditionally* comes under the heading of “natural selection”. *This name derives, we think*, from *an analogy* with human-social “*selection*” in the *process* of “*domestication*” of *initially* ‘exo-human’ «species»; of, e.g., *other* “social” *animals*, and *plants* «species».

The process of “*domestication*” *ensues* in the *historic transitioning from* human “Appropriation” of *portions* of ‘exo-human Nature’ in *their* “*raw*” *form*, *to* the *making* of *some of these living objects* of, *formerly*, mere human predation, into *that plus* “Goods” *production* -- *production* of ‘*good Goods*’, *better and better* “*fit*” for human consumption.

In *those cases*, in the *cases* of the human technology of “*domestication*”, there are human agents -- human subjects -- *who actually* “*selected*” *breeders* for “*selective breeding*”, *by and within* “human Nature”.

However, in the cases of so-called “selection” by and within EXO-human Nature, including by and within PRE-human Nature, no such “selecting” agent, no such “selecting” subject exists.

The name “Nature-al selection” subliminally evokes a pseudo-subject, a non-existent or mystical “agent” that [consciously] “decides” what kinds continue & what kinds die out; what kinds wax & what kinds wane. This faulty evocation amounts to a view which inverts the role of the real subjects [the actual agents] and the real objects -- instancing a “psychohistorical” ‘ideopathic’ [‘ideopathological’] ideological tendency which is typical of The Modern Ideology.

In actuality, the agents that determine the waxing and waning, the proliferation and extinction of populations of units -- of «arithmoi» of «monads» -- in pre-human Nature, and in present exo-human Nature, are the «monads» of the different ontological kinds themselves. These «monads» are active, ‘agentive’, in that sense ‘subject-ive’ -- but of course we are not yet talking about conscious, psychê-ic, human[oid] subjects/agents.

Prevalence of the ‘onto-mass’ of a given ‘onto-type’ of «monads» -- the greater volume of the available ontological cosmological space taken up and occupied by the ‘onto-mass’ of that ‘onto-type’ -- is determined by the rate of ‘onto-mass’ self-reproduction that those «monads» sustain. Those monadic populations -- those [local] «arithmoi» -- that sustain higher rates of ‘onto-mass’ self-reproduction wax, relative to those [local] «arithmoi» that sustain lower rates of ‘onto-mass’ self-reproduction. If the rate of ‘onto-mass’ self-reproduction for the «monads» of a given ‘onto-type’ becomes negative, thus entering a regime of what we call “contracted self-reproduction”, for a sufficient duration, then that ‘onto-type’, that ontology, will become extinct, nullified [‘0’], its ‘onto-mass’ fully converted into (the) ‘onto-mass(es)’ of (an) other ‘onto-type(s)’.

To measure the time-period τ [e.g., the annual] ‘onto-mass reproduction-rate’, ${}_{omr}r_{\tau}$, we use what we call a ‘self-space gain ratio metric’. The computational, quantitative core* of this metric is --

${}_{omr}r_{\tau} = ({}_om_{\tau} - {}_om_{\tau-1}) / ({}_om_{\tau-1} - {}_om_{\tau-2}) = \Delta_om_{\tau} / \Delta_om_{\tau-1}$. The values of this metric are “rational” quantities. When it is mapped into the \underline{q} axioms-system, the seventh system of the systems of arithmetics for dialectics in the F.E.D. standard dialectical presentation for those arithmetics, and an arithmetic that embraces a non-syncoated, fully arithmetical, fully algorithmic, fully ideographical formulation of “dimensional analysis”, it is qualified by the “dimensionless” metrical unit $\hat{\mu}_{u_0} = \hat{\mu}_{u_2} / \hat{\mu}_{u_2} = \hat{\mu}_{u_2} \ominus \hat{\mu}_{u_2}$, i.e., by the unit ‘%/100’. Thus metrically qualified, this metric yields the ‘full zero’ value, $\mathbf{0}$, if ever the numerator of this ratio, and/or its denominator, touches ‘empty zero’, $\mathbf{0}$, per the \underline{q} key axiom $\mathbf{0} \otimes \left[\frac{\hat{\mu}_{u_2}}{\hat{\mu}_{u_2}} \right] = \mathbf{0}$.

The growth of the ‘onto-mass’ of each latest-irrupted “self-hybrid onto-type” occurs, typically, initially, by way of an irruptive and “self-catalyzed” [“autocatalytic”] self-conversion of part of the ‘onto-mass’ of the immediate predecessor ‘self-hybrid onto-type’ into ‘onto-mass’ of that latest-irrupted ‘onto-type’; indeed, into its self-conversion into that very irruption process itself. That self-conversion typically takes the form of an ontologically revolutionary, self-«aufheben» ‘self-meta-unit-ization’, ‘self-meta-«monad»-ization’, or ‘self-meta-holon-ization’ of the units, «monads», or “holons” of that immediate predecessor ‘self-hybrid onto-type’ kind-category/ontological category/«arithmos». This metric measures “Darwinian fitness”. Because it is also a [‘self-ratio’] measure of a [periodic] growth/change of self-reproductive VELOCITY, it is also a measure of a kind of ACCELERATION, thus of a [periodic] ‘self-reproductive self-FORCE’, collectively, of the «monads» of the ‘onto-type’/kind-category/ontological category/«arithmos»-of-«monads» to which it is applied.

*[A fuller rendition of this metric is via the following formula of \underline{q} algebra, per our convention, assigning the metrical unit qualifier $\hat{\mu}_{u_2}$ to “gm.” [the gram unit] --

$${}_{omr}r_{\tau}^0 = \frac{({}_om_{\tau} - {}_om_{\tau-1})}{({}_om_{\tau-1} - {}_om_{\tau-2})} \times \frac{({}_om_{\tau})}{({}_om_{\tau})} \times \frac{({}_om_{\tau-1})}{({}_om_{\tau-1})} \times \frac{({}_om_{\tau-2})}{({}_om_{\tau-2})} \times (\text{sgn}({}_om_{\tau-1} - {}_om_{\tau-2})) \otimes \frac{[\hat{\mu}_{u_2}]}{[\hat{\mu}_{u_2}]}$$

-- wherein the 3 mass quantifier ‘self-ratio’ factors produce the ‘full zero’ value [only] when any one or more of them touches ‘empty zero’, & wherein the ‘sgn’ function implements our sign convention. The ‘self-ratio’ of the gm. metrical qualifier unit, $[\hat{\mu}_{u_2} / \hat{\mu}_{u_2}]$, produces the “dimensionless” metrical qualifier unit $\hat{\mu}_{u_0}$.

When **we** come to those «*arithmoi*» whose units involve ‘*psychê-ic* «*monads*»’ -- «*monads*» containing and centered around *psyches*, i.e., *human[oid]* «*monads*» -- then on top of the *biological genome* is added, in *complex unity* with that *genome*, a *human[oid]* “‘*phenome*’”, made of “*memes*” and of *non-chromosomally acquired language*, etc., and *exo-somatically inherited [material] culture*. For such [*human[oid]*]-*natural formations*, whose *sustained rate of self-reproduction* depends upon the *effectiveness* of that ‘*phenome/genome complex combination*’, including upon the *effectiveness* of *artifacts, tools, means of production of all kinds*, the *metric* for the *sustained rate of ‘onto-mass’ self-reproduction* must be *modified*. It must measure the *sustained rate of self-reproduction of ‘humano-mass’*, or of ‘*human[ized]-Nature-mass*’ as a whole -- the *sustained growth rate of the sum of human[oid] biomass and of ‘human[oid] artifacts-mass’* -- if it is to measure *human[oid]* «*species*» “‘*Meta-Darwinian fitness*’”.

In all of *these cases, ontology and ‘the dynamics of ontology’* -- ‘*ontology-dynamics*’, ‘*ontological dynamics*’, and ‘*onto-dynamasis*’ -- or *ontological revolution*, the *irruption of new ontologies* from out of the *densest cores* of the *populations of older ontologies*, are all about “‘*numbers*’”. But they are about “‘*numbers*’” in a *sense related* to that of the *ancient Mediterranean, Pythagorean, Platonian, Euclidean, Diophantine sense* of the word «*arithmos*», usually [*mis-*]*translated* into English *today* as just “*number*”. The *ancient concept* of «*arithmos*» had a *different sense*, the *sense* of ‘*an indefinite multiplicity of ‘multi-qualitative’, ‘features-full’, ontological units or ‘monads’, all of a given ‘species’; all of a given, specific kind.*

‘*Ontology-dynamics*’ is *not just* about “*numbers*” in the *modern sense*, that of *unqualified abstract quantities*, that *we separate* from *-serving* as *modifiers* or “‘*adjectives*’” of a *qualitative unit*, for which *they would then tell us*, e.g., *how many ‘monads’ or units of that qualitative kind of unit* are *present* for the *symbolization* or for the *representation at hand*. ‘*Ontology-dynamics*’ is *not just* about “*numbers*” of *abstract units*, such that *each single unit* is *denoted, ultimately, and indifferently*, e.g., by the *ideogram 1*, to be *computed-with only in a kind of arithmetical and algebraic expressions* in which the *information* as to “of what” *they* are the *number* is *elided*.

Prevailing human ‘mentalités’, ever since the psychohistorical transition to “‘*modernity*’”, have *come to dominate themselves* with *considerations* of *exchange-value* or *economic value; value upon sale or upon alienation*, to the *detriment* of *qualitative considerations*, in regard to *use-value, etc.* That is, *they came to dominate their thoughts* with regard to *quantities of monetary value units, whose nature, whose substance, whose qualit(y)(ies), whose ontological meaning* (is)(are) *opaque and obscure* for “‘*chaotic*”, *superficial, empiricist perception*. *These units* thus *appear to constitute little other than unqualified, abstract, “pure” quantities*. *Modern minds* have thereby *become profoundly insensitive* to «*arithmos*»; to this *ancient, richer, and deeper sense* of “‘*number*’”.

A *richer, truer, more concrete -- more ‘praxical’ -- grasp* of “‘*number*’” *requires* that “‘*quantifiers*’” be *present*, yes, *but* that *they also* be “‘*qualified*’” by “‘*qualifier*’” *ideogramic, ‘numeralic’* “‘*adjectives*’”; that *ideogramic, ‘numeralic’* “‘*qualifiers*’” *also* be *present, but* that *they also* be “‘*quantified*’” by *ideogramic, ‘numeralic’* “‘*quantifiers*’”; that the “‘*opposites*’” of “‘*quantifier*’” *and/versus* “‘*qualifier*’” *ideogramic, ‘numeralic’* “‘*quantifiers*’” *become unified, and ‘co-modify’, or ‘mutually modify’, as ‘co-adjektival’ determinations* of a *new kind* of *symbols complexes*, that *achieve univocally ‘quanto-qualitative’ or ‘qualo-quantitative’ expressions & meanings*.

Our perspective on these *issues* of “‘*number*’” thus draws upon the *ancient, Mediterranean, philosophical and practical ‘arithmos’ meme* of “‘*number*’”, *and combines it* in *new ways* with *prevailing, modern, ‘abstract, “pure”-quantity-without-qualification’ meme* of *number*. *We see our* perspective as *arising* via a *psychohistorical helical return* of the *Pythagorean paradigm* of “‘*number*’” as ‘*qualo-quantitative*’ «*arithmos*», but a *return at a higher level, a return* which *thereby* “‘assimilates all of the wealth of subsequent development’” -- *all of the memetic wealth* of *post-ancient, or modern, psychohistory to-date*.

Our paradigm of “‘*number*’” is therefore *also ‘Meta-Pythagorean’*. In *particular, it* is ‘*Meta-Pythagorean*’ in that *it transcends* the *radical dualism* of «*arithmos*» *versus* «*monads*» which *pervades*, e.g., the *Pythagorean, Platonian, Euclidean, and Diophantine accounts* of their ‘*universal ‘arithmos’ theory*’. For, *crucial to our* paradigm, *and to its ‘dialecticality’*, is the *view* that «*arithmoi*» *become* «*monads*» -- that by a *dialectical*, i.e., by an «*aufheben*», *process, ‘sub-arithmoi’* of a *given ‘species’-arithmos*, *can, and do, regularly, become* ‘*[meta-]‘monads’*’, forming the *new ‘[meta-]‘arithmos’* of an *ontologically new ‘species’*. Moreover, «*arithmoi*» *can become* «*monads*», e.g., in an ‘*arithm-etic*’ of *ontological ‘species’ units*; a *calculus of dialectical [‘aufhebenistic’] ontological categorial units and of their categorial combinatorics*, whose “‘*numbers*’” -- whose «*arithmoi*» -- take the *shape* of *categorial unit qualifier ideograms* as its ‘*meta-numerals*’. *We mean* the *N* *F.E.D. first arithmetic/algebra* for *dialectical logic*.

Just Two Ways. Given our ‘[Meta-]Pythagorean’, «arithmoi» of «monads» perspective on the ontological content of our cosmos, we see just two ways, two forms of the universal «aufheben» process, in which deep, qualitative, ontological change happens, and, to our knowledge, ever can happen, in this cosmos:

1. Change can happen via categorial ‘self-combination’, i.e., by «arithmos» ‘self-combination’, or, equivalently, by the mutual combination/fusion of «monads» of a single ‘onto-type’, category, or «arithmos». If we represent such a category by \underline{x} , and apply the product rule for the ‘triple-conservation meta-genealogical evolute product’, then we can symbolize such categorial ‘self-combination’, proxying monadic mutual combination/fusion, as [per solution-assertion $\underline{\Delta x} \dashv\equiv \underline{y}$; solving the algebraic unknown $\underline{\Delta x}$ by the known category \underline{y} .] --

$$\underline{x} \times \underline{x} = \underline{x} + \underline{x} + \underline{\Delta x} = \underline{x} + \underline{\Delta x} \dashv\equiv \underline{x} + \underline{y}$$

-- wherein $\underline{\Delta x}$ and \underline{y} denote the new category, the new «arithmos», the new ontological kind, which is an «arithmos» of meta- \underline{x} units, ‘meta-«monads»’, or ‘meta-holons’ with respect to the \underline{x} units/«monads»/-holons, such that each unit of \underline{y} is made up out of a heterogeneous, organized multiplicity of former \underline{x} units/«monads»/holons. If we represent this ‘category qualifier’ by $\underline{q_x}$, then we can symbolize ‘categorial self-combination’, proxying monadic mutual combination/fusion, as [by applying the \underline{q} dialectical arithmetic/algebra.] --

$$\underline{q_x} \times \underline{q_x} = \underline{q_x} + \underline{q_x} + \underline{\Delta q_x} = \underline{q_x} + \underline{\Delta q_x} = \underline{q_x} + \underline{q_{xx}} \dashv\equiv \underline{q_x} + \underline{q_y}$$

-- wherein $\underline{\Delta q_x}$ and $\underline{q_y}$ denote the new category, the new «arithmos», the new ontological kind which is an «arithmos» of meta- $\underline{q_x}$ units, ‘meta-«monads»’, or ‘meta-holons’ relative to the $\underline{q_x}$ units/«monads»/-holons, such that each unit of $\underline{q_y}$ is made up out of a heterogeneous, organized multiplicity of former $\underline{q_x}$ units/«monads»/holons. A term of the form ‘ $\underline{q_{xx}}$ ’ in a category-algebraic progression is termed, by us, a ‘self-hybrid’ ontological category symbol, and also a dialectical ‘‘contra-thesis’’ ontological category symbol. Such an algebraic term is typically solved [‘ $\dashv\equiv$ ’] as signing the ‘self-conversion’ of $\underline{q_x}$ ‘onto-mass’ into $\underline{q_{xx}} \dashv\equiv \underline{q_y}$ ‘onto-mass’.

2. Change can happen via multi-categorial ‘hybrid combination’, i.e., by «arithmoi» ‘mutual combination’, or, equivalently, by the mutual combination/fusion of the disparate-kind «monads» of two or more ‘onto-types’, ontological categories, or «arithmoi». If we represent just a pair of such categories by \underline{x} & \underline{y} , such that $\underline{x} \not\equiv \underline{y}$, and [again] apply the multiplication rule for the ‘triple-conservation meta-genealogical evolute product’, then we can symbolize such categorial ‘mutual combination’, proxying multiple «monads» hybridization, as [again, per our solution-assertion $\underline{\Delta[y; x]} \dashv\equiv \underline{z}$; solving the algebraic unknown $\underline{\Delta[y; x]}$ by the known category \underline{z} .] --

$$\underline{y} \times \underline{x} = \underline{y} + \underline{x} + \underline{\Delta[y; x]} \dashv\equiv \underline{y} + \underline{x} + \underline{z}$$

-- wherein $\underline{\Delta[y; x]}$ & \underline{z} denote the new category, the new «arithmos», the new ontological kind which is an «arithmos» of hybrid \underline{x} and \underline{y} units, «monads», or holons relative to the \underline{x} & \underline{y} units/«monads»/holons, such that each unit of \underline{z} is made up out of a heterogeneous, organized multiplicity of some former \underline{x} units/«monads»/-holons. If we represent such categories by $\underline{q_x}$ & $\underline{q_y}$, then we can symbolize such ‘CATEGORIAL level mutual combination’, or hybridization, proxying multiple «MONADS» combinations/fusions, as [again, by applying the \underline{q} axioms-system for a ‘purely’-qualitative, ‘contra-Boolean’ arithmetic/algebra for dialectical logic.] --

$$\underline{q_y} \times \underline{q_x} = \underline{q_y} + \underline{q_x} + \underline{q_{yx}} \dashv\equiv \underline{q_y} + \underline{q_x} + \underline{q_z}$$

-- wherein $\underline{q_{yx}}$ and $\underline{q_z}$ denote the new category, the new «arithmos», the new ontological kind which is, e.g., an «arithmos» of new units, each of which is a hybrid of $\underline{q_y}$ and $\underline{q_x}$ units; ‘hybrid «monads»’, or ‘hybrid holons’, with respect to the $\underline{q_y}$ and $\underline{q_x}$ units/«monads»/holons, such that each unit of $\underline{q_z}$ is made up out of a heterogeneous, organized multiplicity of former $\underline{q_y}$ and $\underline{q_x}$ units/«monads»/holons.

A *term*, of the *form* ' \mathbf{q}_{yx} ', in a *category-algebraic progression*, is *termed*, by \mathbf{u}_s , a [merely] “‘*hybrid*’” *ontological category symbol*, and also a [full or partial] *dialectical* “‘*synthesis*’” *ontological category symbol*. Such an *algebraic term* is typically solved as signifying the \mathbf{q}_y -catalyzed conversion of \mathbf{q}_x ‘*onto-mass*’ into \mathbf{q}_y ‘*onto-mass*’.

One might well think of the *irruptions* of *new ontology*, of *new kinds* of «*arithmoi*», made up out of *new kinds* of «*monads*», as being *multi-monadic* [*multi-*]*collision singularities* -- as *resulting from collisions / fusions* of *multiple* [e.g., typically, of *more* than *two*] «*monads*», whether *all* of the *same kind*, or *of heterogeneous kinds* -- *taking the form of ‘metafinite singularities’* which are also ‘*ontological revolutions*’ in *Nature* -- ‘*revolutions*’ in the *history of the* ‘[*self-meta-*]*evolutions*’ of *Nature*.

Thus, the *expressions* $\mathbf{q}_x \times \mathbf{q}_x = \mathbf{q}_x + \mathbf{q}_{xx}$ and $\mathbf{q}_y \times \mathbf{q}_x = \mathbf{q}_y + \mathbf{q}_x + \mathbf{q}_{yx}$ may be seen as “*purely*”-*qualitative precursors* to *possible* “‘*closed-form, analytical, qualo-quantitative general solution functions*’” for *nonlinear* -- e.g., for *collisional* -- *differential equations*, involving those *finite-time division-by-zero singularities* to which *nonlinear differential equations* are, *inherently, particularly prone*.

Some Examples.

Example 1. *How did the then-new ontology of “‘Sub-atomic’” “particles” arise*, in a *universe then containing perhaps only* “*dark energy*”, “*dark matter*”, and “*non-composite bosons and fermions*” -- the *latter two together forming*, for \mathbf{u}_s , the *single ontological category* of “‘pre-nuclear’” “particles”?

That new, “‘Sub-atomic’” “particles” *ontology arose* by the *mutual combination* of *only some* of the “‘pre-nuclear’” “particles” [“‘pre-nuclear’” *units*; “‘pre-nuclear’” «*monads*»] of *that single ontological category* of “*non-composite bosons and fermions*”. *Specifically, this new ontology arose* via *quarks* [a «*species*» of the *fermions* «*genos*»] and *gluons* [a «*species*» of the *bosons* «*genos*»], “‘*fusing*’” *together, forming* “‘*composite bosons and fermions*’” -- e.g., *mesons, evanescent unbound neutrons, evanescent unbound hyperons, and enduring unbound protons*: “‘Sub-atomic’”, “‘pre-atomic’” “particles”. Applying the \mathbf{N}_Q *dialectical ideography* to *this example, we have*: $\mathbf{q}_n \times \mathbf{q}_n = \mathbf{q}_n + \mathbf{q}_{nn} \mid \equiv \mathbf{q}_n + \mathbf{q}_s$.

Example 2. *How did the then-new ontology of “‘atomic nuclei’” «*monads*» arise*, in a *universe then containing perhaps only* “*dark energy*”, “*dark matter*”, “*non-composite bosons and fermions*”, and “‘*composite bosons and fermions*’” -- the *latter two together forming*, for \mathbf{u}_s , the *single ontological category* of “‘Sub-atomic’” “particles”?

That new, “‘atomic nuclei’” *ontology arose* by the *mutual combination* of *some* of the “‘Sub-atomic’” “particles” [“‘Sub-atomic’” *units*; “‘Sub-atomic’” «*monads*»], of *that single ontological category* of “*composite bosons and fermions*”. *Specifically, this new ontology arose* via *protons and neutrons* [two «*species*» of the [“*composite*”] *fermions* «*genos*»] and *mesons* [a «*species*» of the [“*composite*”] *bosons* «*genos*»], “‘*fusing*’” *together, forming ionic* “‘atomic nuclei’”, in *both stable and evanescent varieties*. Applying the \mathbf{N}_Q *dialectical ideography* to *this example, we have*: $\mathbf{q}_s \times \mathbf{q}_s = \mathbf{q}_s + \mathbf{q}_{ss} \mid \equiv \mathbf{q}_s + \mathbf{q}_a$.

Example 3. How did the then-new ontology of “‘molecules’” «monads» arise, in a universe then holding perhaps only “dark energy”, “dark matter”, “non-composite” bosons and fermions, “‘composite bosons and fermions’”, ionic “‘atomic nuclei’”, and, perhaps already, neutron star ‘bulk neutronium’, “black hole” ‘bulk holonium’, plus their early aggregates -- ..., early galaxies, early stars, early planets, early planetoids, early moons, ..., early interstellar gas and dust particles, and early ‘proto-stellar atomic clouds’?

That then-new “‘molecules’” ontology arose by the mutual combination of some of the “‘atoms particles’” [“‘atomic’” units; “‘atomic’” «monads»; “‘atoms’” as holons]. Specifically, this new ontology arose via “‘atoms’” “‘joining’” together, forming “‘molecules’”. Applying the NQ dialectical ideography to this example, and given a prior process -- mapped as $\mathbf{q}_a \times \mathbf{q}_n = \mathbf{q}_a + \mathbf{q}_{an}$ -- in which ionic “‘atomic nuclei’” «monads» combined with just some of the «monads» of the electrons sub-arithmos of the \mathbf{q}_n «arithmos», to form neutral, or only partly-ionized, atoms, we have -- $\mathbf{q}_{an} \times \mathbf{q}_{an} = \mathbf{q}_{an} + \mathbf{q}_{anan} \equiv \mathbf{q}_{an} + \mathbf{q}_m$.

One may reach a richer interpretation of the generic algebraic equations of ontological change / ‘meta-evolution’ given above, $\mathbf{q}_x \times \mathbf{q}_x = \mathbf{q}_x + \mathbf{q}_{xx}$ and $\mathbf{q}_y \times \mathbf{q}_x = \mathbf{q}_y + \mathbf{q}_x + \mathbf{q}_{yx}$, by way of applying, beyond NQ arithmetic/algebra’s axioms-system [see: http://www.dialectics.org/dialectics/Briefs_files/Hermes_de_Nemores.F.E.D._Preface_to_New_Guest_Author.E.D._Brief_5.revision.posted_20FEB2013.pdf], the richer, more complex, more ‘thought-concrete’ WQ axioms-system. One may re-cast the first equation in terms of a discrete-time variable, τ , as exponent, such that $\tau \in \mathbf{W} \equiv \{0, 1, 2, \dots\}$, replacing $\mathbf{q}_x \times \mathbf{q}_x$ with $\mathbf{q}_x^\tau \times \mathbf{q}_x^1$. This τ variable is calibrated so that $\tau = 1$ coincides with the attainment, via the sustained expanded self-reproduction of population / «arithmos» \mathbf{q}_x , of “‘critical density’” [&/or of critical “‘temperature’”] within the self-expanding ‘onto-mass’ of that self-reproducing population of \mathbf{x} -‘onto-type’ «monads», collectively denoted by \mathbf{q}_x .

Thus, per the WQ axioms [see: http://www.dialectics.org/dialectics/Briefs_files/Hermes_de_Nemores.F.E.D._Preface_to_New_Guest_Author.E.D._Brief_6.revision.posted_20FEB2013.pdf], for time $\tau = 0$, i.e., just before the barest beginning of $\mathbf{q}_x \leftrightarrow \mathbf{q}_x$ intra-action, we have --

$$\mathbf{q}_x^\tau \times \mathbf{q}_x^1 = \mathbf{q}_x^0 \times \mathbf{q}_x^1 = \mathbf{q}_0 \times \mathbf{q}_x = \mathbf{q}_0 + \mathbf{q}_x + \mathbf{q}_{0+x} = \mathbf{q}_x + \mathbf{q}_{0+x} = \mathbf{q}_x + \mathbf{q}_x = \mathbf{q}_x \leftrightarrow \mathbf{q}_x$$

-- given $\mathbf{q}_x^0 = \mathbf{q}_0$, and wherein we have taken $\mathbf{X} \in \mathbf{W}$ as the Whole number to which ontological category \mathbf{q}_x is assigned in the generic, “‘uninterpreted’”, WQ arithmetic. I.e., at time $\tau = 0$, only ‘onto-type’ \mathbf{q}_x is extant.

By such interpretation and calibration of τ , as of time $\tau = 1$, the interactions / “‘collisions’” among multiple ‘onto-type’ \mathbf{q}_x «monads» reach a frequency and intensity sufficient to fuse some of the extant \mathbf{q}_x «monads» with other such \mathbf{q}_x «monads», yielding a relatively stable new population / «arithmos» of the new «arithmos» \mathbf{q}_{xx} , i.e., of «arithmos» \mathbf{q}_y , given the solution $\mathbf{q}_{xx} \equiv \mathbf{q}_y$. So, for time $\tau = 1$, i.e., when $\mathbf{q}_x \leftrightarrow \mathbf{q}_x$ intra-action waxes full as ‘singularity-inducing criticality’, we have --

$$\mathbf{q}_x^\tau \times \mathbf{q}_x^1 = \mathbf{q}_x^1 \times \mathbf{q}_x^1 = \mathbf{q}_x^2 = \mathbf{q}_x \times \mathbf{q}_x = \mathbf{q}_x + \mathbf{q}_x + \mathbf{q}_{x+x} = \mathbf{q}_x + \mathbf{q}_{2x} \equiv \mathbf{q}_x + \mathbf{q}_{xx} \leftrightarrow \mathbf{q}_x + \mathbf{q}_{xx} \equiv \mathbf{q}_x + \mathbf{q}_y$$

-- given that the juxtaposition of subscripted Whole numbers denotes their addition [not their multiplication]. That is, time $\tau = 1$ coincides with a ‘metafinite, multi-collisional singularity’; self-conversion of some of the ‘onto-mass’ of ‘onto-type’ \mathbf{q}_x , into ‘onto-mass’ of ‘onto-type’ \mathbf{q}_{xx} or \mathbf{q}_y , together with a possible continued, “‘evolute’” presence [‘+’] of ‘onto-mass’ of the earlier ‘onto-type’ -- i.e., of ‘onto-type’ \mathbf{q}_x . We denote this irruption of the new \mathbf{q}_y by ‘ $\uparrow \mathbf{q}_y$ ’.

Similar are the results for time $\tau = 0$, and for time $\tau = 1$, for the second equation, $\mathbf{q}_y \times \mathbf{q}_x = \mathbf{q}_y + \mathbf{q}_x + \mathbf{q}_{yx}$, with $\mathbf{q}_y^\tau \times \mathbf{q}_x^1$ replacing $\mathbf{q}_y \times \mathbf{q}_x$.

We have, for time $\tau = 0$, i.e., just before the barest beginning of the $\mathbf{q}_y \leftrightarrow \mathbf{q}_x$ interaction --

$$\mathbf{q}_y^\tau \times \mathbf{q}_x^1 = \mathbf{q}_y^0 \times \mathbf{q}_x^1 = \mathbf{q}_0 \times \mathbf{q}_x = \mathbf{q}_0 + \mathbf{q}_x + \mathbf{q}_{0+x} = \mathbf{q}_x + \mathbf{q}_{0+x} = \mathbf{q}_x + \mathbf{q}_x = \mathbf{q}_x \leftrightarrow \mathbf{q}_x$$

-- and, for $\tau = 1$, when $\mathbf{q}_x \leftrightarrow \mathbf{q}_x$ interaction comes to fullness as ‘collisional-singularity-inducing criticality’ --

$$\mathbf{q}_y^\tau \times \mathbf{q}_x^1 = \mathbf{q}_y^1 \times \mathbf{q}_x^1 = \mathbf{q}_y \times \mathbf{q}_x = \mathbf{q}_y + \mathbf{q}_x + \mathbf{q}_{y+x} \equiv \mathbf{q}_y + \mathbf{q}_x + \mathbf{q}_{yx} \leftrightarrow \mathbf{q}_y + \mathbf{q}_x + \mathbf{q}_{yx} \equiv \mathbf{q}_y + \mathbf{q}_x + \mathbf{q}_y.$$

We denote this *irruption* of the *new ontology denoted by ontological category symbol* q_{yx} by ' $\uparrow q_{yx}$ '.

Again, *time* $\tau = 1$ coincides with a '*metafinite, multi-collisional singularity*', this *time one* defined by the [mere] *conversion* of '*onto-type*' q_x '*onto-mass*' / «*monads*», into '*onto-type*' q_{yx} '*onto-mass*' / «*monads*», as *catalyzed* by the '*onto-type*' q_y *arithmos* / '*onto-mass*' / «*monads*», *itself/themselves*.

In *terms* of *our three examples*, applying the *general forms* above to the *specific cases* below, *we thus have* --

1. As $\tau = 0$ goes to $\tau = 1$, $q_n^\tau \times q_n^1 = q_n^0 \times q_n^1 = q_0 \times q_n = q_n$ goes to $q_n^\tau \times q_n^1 = q_n^1 \times q_n^1 = q_n^2 = q_n \times q_n = q_n + q_n + q_{nn} = q_n + q_{nn} \models q_n + q_s$;
2. As $\tau = 0$ goes to $\tau = 1$, $q_s^\tau \times q_s^1 = q_s^0 \times q_s^1 = q_0 \times q_s = q_s$ goes to $q_s^\tau \times q_s^1 = q_s^1 \times q_s^1 = q_s^2 = q_s \times q_s = q_s + q_s + q_{ss} = q_s + q_{ss} \models q_s + q_a$;
3. As $\tau = 0$ goes to $\tau = 1$, for *this reaction*, $q_a^\tau \times q_n^1 = q_a^0 \times q_n^1 = q_0 \times q_n = q_n$ goes to $q_a^\tau \times q_n^1 = q_a^1 \times q_n^1 = q_a \times q_n = q_a + q_n + q_{an} \models q_a + q_n + \textit{electrically partially/fully de-ionized atoms}$; then, as $\tau = 0$ goes to $\tau = 1$, for *this reaction*, $q_{an}^\tau \times q_{an}^1 = q_{an}^0 \times q_{an}^1 = q_0 \times q_{an} = q_{an}$ goes to $q_{an}^\tau \times q_{an}^1 = q_{an}^1 \times q_{an}^1 = q_{an}^2 = q_{an} \times q_{an} = q_{an} + q_{an} + q_{anan} = q_{an} + q_{anan} \models q_{an} + q_m$.

Examples of this recurring / 'self-surmounting' / 'self-expanding' pattern -- of *lower unit[ie]s fusing together* to *form higher unit[ie]s* -- are *not at all confined* to the *three* that *we have presented herein* -- i.e., to the subject "'matters'" of "*Big Bang*", *cosmological* ["*particle*"-] *physics and* of [*cosmo*-] *chemistry*.

It is, *we hold*, a *universal recurrence-pattern*.

Again and again, the *original fusing together* of *predecessor unit[ie]s*, into *new, unprecedented, higher successor unit[ie]s* is the *occasion* for the *emergence*; for *their first-time in manifestation*, of "*emergent properties*"; of *unprecedented 'emergent qualities'*; of '*emergent new ontology*', *and, with all of this*, the *emergence, also*, of *new, unprecedented kinds of action / behavior*.

But let *us leave our rendition* of the *progression of further examples*, from the *later history of the dialectic of Nature* -- from the *later history of our* «*kosmos*» -- to a *later time*.