

SUPPLEMENTS TO THE **F.E.D.** INTRODUCTORY LETTER

An Introduction to Dialectical Arithmetic:

A Primer for *Dialectical Ideography*.

by **Hermes de Nemores**

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About the Author

Hermes de Nemores. "All that you need ever know of me, in any personal sense, is this: even today, my friends still call me "Cap'n Nemo", but, now, that name is only a name of affection, said partly in jest. Had it not been for Karl Seldon, catalyzing the deepening of my awakening at the crucial moment, then Captain Nemo's *literary* fate would have been my own *literal* fate. Dr. Seldon demonstrated to me that violent revenge is not the only, let alone the most efficacious, mode of response to those monstrous miscreant minions of private-capitalist and state-capitalist totalitarianism who continue to depredate our world. For the helping hand that Dr. Seldon extended to me in that moment of truth, I will always be grateful, for, as a result, I have found a way to serve, however humbly, the higher possibilities of the human species, and the actualization of our cosmological destiny, from out of the ecstasy of the empyrean vision."

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ABSTRACT:

An Introduction to Dialectical Arithmetic --

The Arithmetics of Dialectics that Arise as the Fruition of an Immanent Critique of the Standard Arithmetics.

"... don't we know that all of this is a prelude to the song itself... the song itself that dialectic sings..." -- Plato, *Republic*, 531c-532a, circa 380 B.C.E.

"And, however much the understanding may, as a matter of habit, bristle at the dialectic, still the latter must in no way be regarded as present only for philosophical consciousness; on the contrary, what is in question here is found already in all other forms of consciousness, too, and in everyone's experience. Everything around us can be regarded as an example of dialectic. For we know that, instead of being fixed and ultimate, everything finite is alterable and perishable, and this is nothing other than the dialectic of the finite, through which the latter, being implicitly the other of itself, is driven beyond what it immediately is and overturns into its opposite... Furthermore, the dialectic also asserts itself in all the particular domains and formations of the natural and spiritual world. In the motion of the heavenly bodies, for example, a planet is now in this position, but it also has in-itself to be in another position, and, through its motion, brings this, its otherness, into existence. Similarly, the physical elements prove themselves to be dialectical, and the meteorological process makes their dialectic apparent. The same principle is the foundation of all other natural processes, and it is just this principle by virtue of which nature is driven beyond itself."

-- Hegel, *Science of Logic, Part I, Encyclopedia of the Philosophical Sciences*, Hackett Publishing, Cambridge: 1991, p. 130, circa 1830 C.E.

[1868 C.E.]: "Already foreseeing the end of his 'Economics', Marx wrote Joseph Dietzgen that he wanted to undertake a book on dialectics and declared that 'the true laws of dialectics are to be found already in Hegel, in a mystic form, however. The problem is to divest them of this form'."

[1875 C.E.]: "Sometime in the course of this year Marx had worked out a detailed mathematical scheme for the relation of surplus value to profit, as presented in the third book of Capital. In mid-December he wrote to Dietzgen that once he had finished with the 'Economics' he intended to write on the subject of dialectics."

-- M. Rubel, M. Manale, *Marx Without Myth: A Chronological Study of His Life and Work*, Harper & Row, NY: 1975, pp. 233; 300.

Capsule Summary. The primer text summarized in this abstract describes a higher arithmetic which (1) models a dialectical, «*aufheben*», «*auto-kinesis*» logic, one which (2) configures as a 'contra-Boolean Arithmetic/Algebra of logic', by way of taking, as its fundamental principle, a 'strong' negation of Boole's "fundamental law of thought", or "law of duality", which (3) emerges as a modern[ized] rediscovery of Plato's lost «*arithmos eidetikos*», his "*arithmetic of ideas*" or "*arithmetic of dialectics*", and which (4) simultaneously configures also as a "Non-Standard" Model of the "Natural" Numbers, {1, 2, 3, . . .}, by fulfilling the first four, "first-order" postulates formulated circa 1889 C.E. by Giuseppe Peano to characterize the "Standard" "Natural" Numbers. The possibility of such "Non-Standard" Models of the "Natural" Numbers, as something *inescapably immanent* in the very axiomatization of the "Standard Model" itself, was foretold by some of the deepest theorems of modern mathematics and logic, circa 1930 C.E., but has remained but little explored ever since. Though the 'Natural Dialectors' of this 'Non-Standard "Natural" Arithmetic' fulfill the first-order Peano Postulates, they model a system of arithmetic which is the very *opposite* of, which is, in fact, a 'first *contra-thesis*' to, the Standard "Natural" Arithmetic, when the latter is taken as starting point, «*arché*», or '*thesis*' of a 'meta-systematic', dialectical derivation of the systems of arithmetic. The antithesis "of" or "between" this 'first thesis' system and 'first contra-thesis' system of arithmetic points to and calls forth the formulation of a third system of arithmetic, which serves as the 'first *uni-thesis*' for this «*arché*» thesis and its 'first contra-thesis'. The resulting 'synthesis', constituted by these first three systems of arithmetic, taken together, breaks out in a further dialectical progression of systems of dialectical, and, generally, of '*quanto-qualitative*', arithmetic, with each successive arithmetical/ideographical language being richer, more concrete, more complex, and more realistic in terms of its capability for description. This dialectical progression of systems of dialectical arithmetic, along its way, first encompasses, then surpasses, the descriptive capability of contemporary nonlinear dynamical systems theory. Moreover, the diachronic '*ideo-meta-system*' constituted by this *dialectical succession of systems of dialectical arithmetic* can be modeled, *both reconstructively and predictively*, using the algebraic language of the very 'first contra-thesis' system of dialectical arithmetic itself, in a '*meta-systematic dialectical*', categorial-progression-as-systems-progression exposition. The heuristic application of the 'first contra-thesis' system of arithmetic to the modeling of the dialectic of nature, by augmenting insight into the reconstruction of the past and the 'pre-construction' of the future, has led to the discovery of new hypotheses regarding both the past and the future of humanity and of the cosmos as a whole. These applications are outlined, in the second part of the exposition, via eleven dialectical models of various aspects of human/natural 'meta-evolution', constructed using the algebra of that arithmetic.

Extended Summary. This 'first contra-thesis' system of 'Peanic' arithmetic, which is also a 'contra-Boolean' ideography of ['*onto-logical*'] logic, leads, per its own, immanent 'meta-systematic dialectic' -- a dialectic of itself which it can also model in its own language -- to a whole progression of dialectical calculi of increasing descriptive power -- of increasing richness of determinations/concreteness/realism, which embody, quite spontaneously and 'naturally', and from their very core and root, an ontologically *non-reductionist* ideographical, syntactical and semantical linguistic principle. This principle is rooted in the generalization of the "Natural" Numbers addition operation to encompass two opposite extremes, flanking ordinary, quantitative, "amalgamative" addition, namely, the 'hyper-amalgamative' addition of 'Boolean', "idempotent", or 'unquantifiable' addition [e.g., $x + x = x$] on one side, and, especially, the '*non-amalgamative*', 'inhomogeneous', 'heterogeneous', or '*non-reductive*' addition [e.g., $a + bi = a \cdot (+1) + b \cdot \sqrt{-1}$], on the other side.

A Contra-Boolean Algebra. This arithmetic/algebra of dialectics is 'contra-Boolean' by way of its taking, as its fundamental rule, a 'strong' and hitherto unnoticed negation of the fundamental rule of Boole's arithmetic/algebra of formal logic, which Boole himself termed "the fundamental law of thought". Boole's "fundamental law of thought" is an ideographical, algebraic statement of formal logic's "law of [*propositional*] non-contradiction". The negation of that "law" in the subject 'contra-Boolean' arithmetic/algebra, is not an assertion of *propositional* self-contradiction, but, rather, a statement of *ontological-existential* 'self-/ internal-/ immanent-contradiction', or 'intra-duality', giving rise to an existential, 'chronogenic', and ontological -- or '*onto-dynamical*' -- version of what Plato, in his later dialogues, especially those composed after *The Parmenides*, termed «*auto-kinesis*»: the concept which became the dialectical revolutionizing centerpiece of the final phase of his dialectical philosophy.

A "Non-Standard" Version of "Natural" Arithmetic. The 'contra-Boolean' 'first contra-thesis' arithmetic/algebra, which models dialectical logic, is also a "Non-Standard Model" or "Non-Standard Interpretation" of the system of arithmetic of the so-called "Natural" Numbers, $\{1, 2, 3, \dots\}$. That is, it conforms to the first four of the five "Peano Postulates", put forth by Giuseppe Peano circa 1889, which otherwise describe the "Standard Model" or "Standard Interpretation" of the "Natural" Numbers. This alternative system, of dialectical arithmetic, instantiates those four postulates just as much as does "Standard" Arithmetic, and yet it is a *qualitative opposite* of that "Standard" system.

The logical possibility of "Standard" and "Non-Standard" Interpretations of the Peano Postulates -- and of the quality of 'Peanicity' which those Postulates describe and encode -- is implied by the co-applicability of Gödel's circa 1930 "Completeness Theorem" and "Incompleteness Theorem" at the level of the first four, "first order" Peano Postulates or Axioms. [They are termed "first order" because they address only individual "Natural" "Numbers", but not qualities shared in common by *groups* of such "Numbers", or by even higher "logical types" of constructs, e.g., by "*groups of groups*", «*et sequela*»]. This 'Gödelian' recognition of the logical co-possibility of both the "Standard Model" and the "Non-Standard Models" of the Peano Postulates' "Natural" "Numbers" thus arises as an *immanent critique* of the "Natural Numbers" system of arithmetic, and of all of the rest of contemporary axiomatic/"standard" mathematics, which flows from that system, 'explicitizing' the initially hidden, implicit conceptual 'intra-duality' or 'self-duality' of those systems.

The "Standard Natural Numbers" interpretation of the Peano Postulates can be described as that of an 'ideographic language', or 'ideography', of pure/abstract/generic '*unqualified quantifiers*' -- i.e., the ideogram "2" does not signify 2 apples, 2 oranges, 2 centimeters, 2 kilograms, or 2 hours, ..., but *just the 'quantifier' part, only*, of those preceding expressions, abstracted/extracted from its combination there with its '*ontological qualifiers*' -- 'apples', 'oranges' -- or with its '*metrical qualifiers*' -- 'centimeters', 'kilograms', 'hours', etc.

The 'contra-Boolean' arithmetic, which is also a "Non-Standard Interpretation" of those first four Peano Postulates, can be interpreted, in terms of a '[meta-]systematic dialectic' of successive/progressive systems of arithmetic, as the contrary or 'contra-thesis' of that "Standard" rules-system for an ideography of 'unqualified quantifiers', namely, as a rules-system for an equally 'Peanic' arithmetic/ideography of '*unquantifiable* ontological *qualifiers*'. The 'non-collapsing', 'non-reducing', or "non-amalgamative" 'sum' of the symbols denoting these two systems of arithmetic, **thesis** + '**contra-thesis**', is the "antithesis" or 'antithesis-sum'. It represents an «*aufheben*» co-awareness of both systems, 'additively' conserving the '**thesis**' system, while also negating/"annulling" it and "elevating" it in the form[ation] of the '**contra-thesis**' system. Indeed, the latter, 'contra-thesis' system of arithmetic, also "conserves" the 'thesis-system', within itself, by way of the 'self-internalization', or 'self-subsumption', of the "monads" or "units" of that 'thesis-system'.

This 'antithesis-sum' calls for a 'synthesis-sum', via the conception of a third rules-system of arithmetic, an ideography of 'qualifiable quantifiers', and, equally, of 'quantifiable qualifiers': a simultaneously and 'unifiedly' 'quanto-qualitative' or 'qualo-quantitative' ideographical arithmetic. The 'poly-qualinomial', 'non-collapsing', "non-amalgamative", 'irreducible/non-reductive' 'sum' of these three, *successively/progressively evoked*, arithmetics, thesis + 'contra-thesis' + 'uni-thesis', constitutes the "synthesis", or 'synthesis-sum', representing the «*aufheben*» conceptual co-awareness or co-positing of all three systems of arithmetic: N, NQ, and NU.

A Dialectical Progression of Dialectical Arithmetics. The further self-unfolding of this 'dialectic of dialectical arithmetics', many steps beyond -- many systems and 'ideo-ontological' categories of dialectical arithmetic and many new kinds of 'dialectical meta-numbers' beyond -- the third step, described above, quite 'naturally' yields a univocally 'quanto-qualitative' mathematics, one whose descriptive power first encompasses and then surpasses that of the nonlinear differential-equations-systems, state-space/control-parameter-space models of contemporary dynamical systems theory. Where the "Standard" mathematics of [especially the nonlinear] differential equations gives INFINITELY WRONG ANSWERS, in the realm of the finite-time zero-division "singularities", or 'locally-complete ontological self-conversions / self-depletions / neo-self-accumulations', this 'quanto-qualitative' mathematics gives 'meta-FINITE, RIGHT ANSWERS, once the "Standard", pure-quantitative, 'unqualified' differential equations have been 're-qualified' using the ideographical, 'numeralic', and 'quantifiable' metrical qualifiers and ontological qualifiers of the latter, 'quanto-qualitative', dialectical, arithmetics. Moreover, these are *answers that contemporary, pure-quantitative mathematics cannot even express*. Such singularities are essentially, intrinsically -- immanently -- tied up with the nonlinearity or 'self-reflexivity' of degree > 1 nonlinear differential equations [which are so much more *immanently* prone to such singularities than are linear differential equations], and with the reasons that nonlinear differential equations are considered "unsolvable in general" according to most contemporary, pure-quantitative, 'qualifier-elided' and 'quality-alienated' modes of mathematical thinking.

Some Application Hypotheses. Applications include the singularities of such 'psycho-historical', nonlinear equations-systems as might aptly describe the dynamics of the capitalist-securitist system of social reproduction at *that critical point* in the advance of the level of the productive forces/technical composition of capital -- of the 'socio-mass self-productivity rate' or of the "*social negentropy expanded reproduction-rate*" of human society [corresponding to the $\uparrow\Phi^1\Delta h$ term, and impending the $\uparrow\Phi^1\Delta h$ term, of the taxonomy-level 1, cosmological $\{V\}$, U arithmetic, psycho-historical equations, and to the $\uparrow\Phi^2K$ term, and impending the $\uparrow\Phi^2AK$ term, of the taxonomy-level 2, U ideography, psycho-historical equations, 'internal' to the Φ^1h term denoting the 'ontological category' or 'onto' of humanity, wherein Φ^2K denotes the Φ^1h sub-ontology category' of 'Kapitals'-based human social formations] -- which is reflected in the growth beyond 1 of the general social fixed capital-value to circulating capital-value ratio, grasped as an [imperfect] index of the advancing level of 'accumulation of technology', of 'the social forces of production', and of the 'cross-section of vulnerability' of social capital to 'techno-depreciation'. This *critical point* is crossed as the systemic self conversion negation, into 'non-value', of accumulated "older vintage" fixed capital-value [due to obsolescence depreciation in advance of "wear and tear", physical depreciation, given the self-accelerating intensification of the rate of production of relative surplus value by the newest vintages of installed fixed capital-value, this self-acceleration constituting the core capital-behavior incentivized and necessitated by the immanent self-feedbacks of the capitals/profits-system itself], approaches completion for the dominant, 'plutocratized' accumulation-center of hyper-consolidated, hyper-centralized, hyper-concentrated capital-value property, also impending the 'negativization' of the core rate of profit, *net of any competition-enforced techno-depreciation write-offs*, for this accumulation-center. Such equations would describe the ontological, existential self-contradiction, or 'intra-duality', of the capitals-system, including this 'essence-ial', immanent process of the self-reflexive, self-reflexive self-devaluation of past-accumulated capital-value by freshly-accumulated capital-value via: (a.) cheaper [more-productively-produced], and/or (b.) more-productively-producing, and/or (c.) superior-quality product-producing capital equipment -- in short, the 'self-reflexive self-de-capital-ization' of capital via 'techno-depreciation' -- and the continual, inflationary contributions to the formation and accumulation of social-reproductively entropic fictitious capital that this process generates in the context of full-credit-system, debt/bank-financed capital investment, creeping oligopolization, and developed capital-assets/securities markets. Applications also include those very nucleus/nucleus collision-fusion 'Coulomb singularities' and, in general, the singularities and "resonances" of the nonlinear partial differential equations-systems which describe the electrically and magnetically 'self-active', 'auto-kinetic', "plasma" phase of atomic matter, whose "closed-form solution" would reveal those loci within plasma control-parameter-space in which the spontaneous formation of 'self-consistent', continuous-fusion 'toroidal vortices', 'plasma cyclones', or 'plasma flow [self]bottles' arises, yielding the parameter-values for feasible designs of fusion power systems. Fusion technology epitomizes the threat of annihilation that further growth of the productive forces poses to that reigning plutocracy *as such*. It represents an incremental social productive force which would 'techno-depreciate' the core capital power-base of that global 'Dictatorship of Petroleum'. The prospect of its advent, and, with it, of its fatal impact upon that plutocracy's global power, has precipitated its already 'cosmopathic' 'mentalité' into the convergence of a more clandestine 'capitalist anti-capitalism' [corresponding to the $\uparrow\Phi^2K$ term, and impending the $\uparrow\Phi^2AK$ term, of the taxonomy-level 2, U algebraic, psycho-historical equations], with a more open 'human anti-humanism' [corresponding to the $\uparrow\Phi^1\Delta h$ term, and impending the $\uparrow\Phi^1\Delta h$ term, of the taxonomy-level 1, U ideographic, psycho-historical equations]. Seeing its own demise in the humanity-liberating promise of the fusion era, this plutocracy comes to see the further growth of the productive forces of humanity, and all that fosters it, as the deadly adversary of its continued global dominion. It therefore formulates a murderous and pitiless strategy for the world-historical reversal of social 'meta-evolution', via a reversal of the growth of the productive forces. It identifies expanded social reproduction as its lethal enemy, including all of the psycho-social conditions which engender that expansion, adopting world-wide contracted social reproduction as its goal. The popular, public culture of science, technology, education, middle class living standards, representative-democratic conditions of life, and competitive, technologically-innovative capitalism are targeted for termination by that plutocracy as its mortal enemies. The 'ideology-engineering' apparatus of its global Φ^1V , or 'anti-psychohistory', operations aim to annihilate these "enemies", via a lethal "one-two punch", combining two main, "contradictory", 'psycho-engineered' ideologies. While the public continues support its 'ersatz' "conservatism" ploy, it will openly, including by open, brute-force military invasion, impose its 'meta-totalitarian' global dictatorship, thinly disguised, in the core reaches of the capitalist world system, by a 'psycho-engineered' recrudescence of Roman-Imperial pseudo-Christian fundamentalist, New/Final Dark Ages totalitarian theocracy, in antagonistic cooperation with a 'psycho-engineered' recrudescence of 'neo-Caliphate-Imperial' pseudo-Islamic fundamentalist, New/Final Dark Ages totalitarian theocracy, and with other 'ersatz', similarly 'psycho-manufactured' neo-fundamentalist pseudo-religions. When the public reacts against the depredations of this 'Rape-Public-an', Murder Inc., "Killing People For Money is our motto" pincer, it will switch back to its equally 'ersatz', pseudo-leftist pincer: 'social-atavistic', neo-primitivist, "back-to-nature", "people are pollution" pseudo-ecology; the "zero-[negative]-population growth, zero[negative]-economic growth", "science is crime", "technology is evil", neo-Luddite 'meta-totalitarianism' of its psycho-manufactured pseudo-religion of 'Earthism'. The order of appearance of "technologies", of social forces of production, of humanity's appropriation of pre-human nature, both as materials-resource and as 'energy'/'negentropy' source; of 'universal labor', including of the latter's conversion into social self-productive force via science applied to the collective labor of [social-re-]production, deploys itself, given the cognitive-experiential, 'psycho-historical' order-of-accessibility of knowledge-formation for a human species, as a recapitulation in reverse of the order of appearance of the ontology of the pre-human cosmos. It begins with 'human-social energy', "human collective labor", applied to predation, hunting/gathering. It progresses through the harnessing, the herding and domestication, of social animals. Later, 'molecular power', including the social-reproductive appropriation of "fossil fuels", emerges, well before the 'atomic power' of "nuclear fission" and "nuclear fusion". The technologies of 'molecular power' drive deeper appropriations of the molecular ontology of nature, including of "molecular biology"/"genomic self-re-engineering". The capitals-expropriations-process-immanent global emergence of a 'plutocratized' accumulation-center of hyper-concentrated capital-property, encompassing both primary "physical" energy resources and primary financial [social energy] resources [global banking], already creates the potential for a 'meta-totalitarian', state-capitalist/state-securitist conversion of capitalist democracies. This accumulation-center attains financial potential to "buy-out" the executive, legislative, and judicial branches of traditional political constitutional government, "lock, stock, and barrel", in a kind of penultimate 'meta-M&A' hostile takeover of the political state. The threat of its techno-depreciation overthrow, of the overthrow of the plutocracy by the further growth of the productive forces, motivates it to actualize this potential, obviating the "checks and balances"/"countervailing powers" that formerly restrained, to a degree, the tendencies toward absolute power, and absolute corruption, of the 'capital-class'. The totalitarian historical traumas of Nazi state-capitalism and Stalinist 'proto-state-capitalism' were but muted, premature, preventent, and disfigured prefigurements of the 'taxis toward totalitarianism' of core capitalism, the true "law of motion of modern society" [cf. Marx].

The potentially 'mega-beneficial' technology of 'genomic engineering', is monopolized by a tiny, ruling faction of the capitalist plutocracy, committed to continuing its global despotism at any cost, and driven, by the growth of the productive forces, and by all that this growth entails for that plutocracy's hold on global power, to '*capitalist anti-capitalism*' and '*human anti-humanism*'. Given the psycho-historical 'meta-dynamics' of 'capitalist ideology meta-evolution', this plutocracy ultimately identifies the 'memetic learning-enabled' *human genome itself* as the root source of the growth of the productive forces, and thus as that plutocracy's *ultimate* adversary. It ultimately identifies itself as an '*ubermenschen*', 'super-human', 'race', of those who have "made it to"/"come out on" the "top". It secretly appropriates 'cyborg prosthetics/bionics' and other life-extension technologies to itself alone, blocking public knowledge, let alone access, to such technologies *with ever increasing difficulty*. It eventually feels impelled to attempt a '*meta-totalitarian*', '*Meta-Nazi*', '*trans-genocidal*'/'*humanocidal*'/'*genomocidal*' global pandemic/coup; a 'genomically engineered' '*final solution to the humanity problem*'; a demolition of the global proletariat, aiming to replace it with a genomically sub-human, congenitally servile, pandemic-immune chimaera-race of slave drones. The core-plutocracy's goals thus mortally threaten the Terran human species entire, by then well on its way to majority-proletarian conversion. This precipitates the humanity-immanent moment of the '*meta-Darwinian Planetary Selection Test*' for Planet Terra, led by Terran humanity, a crisis characterized by "mutual annihilation" of the actualities modeled by Φ^2_K v. Φ^2_K , Φ^2_{AK} or Φ^2_E v. Φ^2_{AK} or Φ^2_E , Φ^1_h v. Φ^1_h , Φ^1_{Ah} v. Φ^1_{Ah} , and Φ^1_Ψ v. Φ^1_Ψ , whose victory, in the crudity of the \underline{z} approximation, goes to relative preponderance of monads, or, absent sufficient such preponderance, results in "the mutual ruin of the contending classes/ontos".

'Peanic' Succession and Dialectic -- 'Peanicity', Quantitative & Qualitative. All of these developments are contained "in germ" in the «arché» rules-system of dialectical arithmetic, the 'contra-Boolean' arithmetic/algebra first-mentioned above. That first dialectical arithmetic/algebra is an hypothetical, heuristic, 'intentional-intuitional' ideography, the meaning of whose models is more *implicit* -- carried by "interpretation"; by the *connotation* of the variables assigned to the generic 'dialector meta-numerals' by its users -- than it is *explicit* in their syntax and *denotation*, i.e., in the strictly 'extensional', rule-based algorithmics of the undergirding arithmetic. But, as the meta-systematic dialectic of this progression of dialectical arithmetics/algebras continues, it accomplishes a conversion of implicit into explicit, connotation into denotation, semantics into syntax, so that, in the later systems of 'quanto-qualitative' arithmetic/algebra/'meta-analysis', models are rich in 'quanto-qualitative' determinations, with an increasing multitude of explicit constraints tied to measurable, empirical validations of their reconstructions of the past, and 'pre-constructions' of the immediate future. The first four, first-order Peano Postulates describe the 'genus' of what we term '*archeonic consecua*', and of which the '*consecuum*' of the "Standard Natural Numbers" is but one 'species'. An '*archeonic consecuum*' is a sequence of discrete entities, ruled by an explicit, 'Peanic' "successor function", or succession/'progression' principle, with no other entity "between" each consecutive pair of such entities in the sequence/succession/progression, and such that this sequence has a beginning, an «arché» [hence is '*archeonic*'], but has no definite end. The 'Peanicity' of the "Standard" version of the "Natural Numbers" is a '*pure-quantitative Peanicity*' -- the 'Peanicity' of the 'counting progression', the '*counting consecuum*' -- the 1, 2, 3, 4 succession of the generic counting process. The 'Peanicity' of this 'contra-Boolean', "Non-Standard" version of the "Natural Numbers" is a '*pure-qualitative Peanicity*' -- the Peanicity of the 'dialectical succession', of the '*dialectical consecuum*', of the 'progressive-succession' or "progression" of the generic dialectic itself.

This '*purely-qualitative yet arithmetical Peanicity*' is that of the *generic*, 'self-iterative' progression/consecuum --

'first thesis' or '«arché» thesis' →

'first thesis + first contra-thesis' →

'first thesis + first contra-thesis + first full uni-thesis + second contra-thesis' →

'first thesis + first contra-thesis + first full uni-thesis + second contra-thesis + first partial uni-thesis + second partial uni-thesis + second full uni-thesis + third contra-thesis' → ...

-- which *generic* progression can model a vast diversity of specific dialectical processes in both the «*physis*» and the «*anti-physis*» cosmos, just as the generic counting progression applies to a vast, unending variety of instances where counting-up multitudes of "ontologically-identical" units/monads of some population or «*arithmos aisthetos*» [sensuous assemblage] of monads/units may be useful. Taking a key representative instance, this 'contra-Boolean arithmetic/algebra of dialectical logic' can quite readily and naturally model the '[meta-]systematic dialectic/categorical progression exposition of ideo-ontology' of the first part of Hegel's «*Logik*», the "Doctrine of Being", namely, if we choose to 'de-stratify' Hegel's account, putting the main categories of the "Doctrine Of Being" all on a single 'ideo-taxonomical' level --

Indeterminate Being →

Indeterminate Being + *Indeterminate Nothing* →

Indeterminate Being + *Indeterminate Nothing* + *Becoming* + *Determinate Being* →

Indeterminate Being + *Indeterminate Nothing* + *Becoming* + *Determinate Being* + Qualitative Determinateness + Quantitative Determinateness + *Measure* + *Essence* → ...

First one must bring to bear Plato's little-remarked but dramatic conversion, in his later dialogues, beginning with *The Parmenides*, away from a Parmenidean 'stasis-eternalism', toward a philosophy founded upon the comprehensive theoretical pervasion of his concept of «*auto-kinesis*». One then may see that the system of 'pure-quantitative Peanicity', the "Standard Model" "Natural Numbers" system of arithmetic, corresponds to that "arithmetic of *The Understanding*" [cf. Hegel's «*Verstand*»]; of «*dianoia*», which Plato also termed that of the «*arithmoi monadikoi*» [of the *assemblages* or *ensembles* of abstract/generic units, or "monads"]. The 'contra-Boolean' "Non-Standard Model" '*Natural Dialectors*' system of arithmetic corresponds to that "arithmetic of reason" [cf. Hegel's «*Vernunft*»], "arithmetic of the «*eidōs*»", or "*arithmetic of dialectics*", of the «*auto-kinesis*» of ideas, which Plato also termed that of the «*arithmoi eidetikoi*» [that of the 'content-determined', 'genetic' *assemblages* of pure, abstract, basal, 'cognitive-architectonic', «*archē*» ideas, each *idea* or «*ιδέα*» grasped as a kind of '*trans-Pythagorean [meta]-number*']. Both «*arithmoi*» could serve, in different capacities, to elucidate the manifold «*arithmoi aisthetoi*», the sensorially perceptible assemblages of the units, '*Monads*', or «*Movag*», of the sensuous world. The modern world has lost any detailed manuscript accounts of the dialectical «*arithmoi eidetikoi*», which is known today only via Aristotle's polemic against it. It has lost, as well, as a result of the loss of the great Library at Alexandria, any detailed accounts of the «*arithmoi monadikoi*», save for parts of the circa 250 C.E. proto-algebraic manuscript, the *Arithmetica*, attributed to Diophantus of Alexandria. All of these losses form but a part of the colossal, pan-Mediterranean civilizational catastrophe, wrought by the Roman-Imperial pseudo-Christian suppression of the 'Alexandrian proto-Renaissance' overall, by the 'trans-genocidal' Pan-Hellenistic anti-pagan pogrom of that Roman State Church, and by the partially-resultant collapse of social reproduction in the Mediterranean/European human-social world, and its ensuing ten centuries Dark Ages.

The 'philosophical psycho-history' of this ancient upsurge of arithmetic and proto-algebra, and, especially, of the profound 'memetic mutation' that arose in the European Renaissance re-assimilation of that upsurge in general, and of the Diophantus manuscripts in particular, via the vestiges of that upsurge that survived the Dark Ages in the keeping of the Islamic Renaissance, is a little-known story. Major parts of it are traced in a magisterial work, circa 1933, by Jacob Klein, entitled *Greek Mathematical Thought and the Origin of Algebra*. It was composed and published in Berlin while storm troopers stalked the streets and burned books.

Regarding the possibility that Plato and/or his Academy worked out an axiomatization for his three «*arithmoi*» theories, centuries before Peano's breakthrough, and possibly even earlier than Euclid's axiomatization of geometry, Carl Boyer wrote as follows: "Plato seems to have realized *the gulf between arithmetic and geometry*, and it has been *conjectured* that he may have tried to bridge it by his *concept of number* and by the *establishment of number upon a firm axiomatic basis* similar to that which was built up in the nineteenth century independently of geometry; but we cannot be sure, because *these thoughts do not occur in his exoteric writings* and were not advanced by his successors. If Plato made an attempt to *arithmetize mathematics* in this sense, *he was the last of the ancients to do so*, and the problem remained for modern analysis to solve. *The thought of Aristotle we shall find diametrically opposed to any such conceptions. It has been suggested that Plato's thought was so opposed by the polemic of Aristotle that it was not even mentioned by Euclid.* Certain it is that in Euclid there is no indication of such a view of the relation of arithmetic to geometry; but the evidence is insufficient to warrant the assertion that, in this connection, it was the authority of Aristotle which held back for two thousand years a transformation which the Academy sought to complete." [Carl Boyer, *The History of the Calculus and its Conceptual Development*, Dover [NY: 1949], p. 27, *bold italics emphasis added by F.E.D.*].

'*Psycho-Historical*' *Conditions That Have Helped To Delay These Discoveries*. "Pure-quantitative", 'qualifier-elided', 'quality-alienated' mathematical thinking is the historically-specific kind of mathematical thinking that has sprung up under the 'ideology-forming' psycho-historical influence of the exchange-value experience, i.e., of the human experience of the society of "universal alienation" -- of "universal selling" -- i.e., the society of the capital-experience, in which the 'human creative/productive life-hour' metrical qualifier of value and, ultimately, of monetary price, that resolves the paradox of the price-equation of otherwise qualitatively different use-values, commodities, is submerged in human consciousness, such that qualitatively, ontologically different use-values appear, on the "surface of society", to be equated via "pure quantity alone"; monetary price alone. The *truly qualitative* 'metrical qualifier', or unit of measure, of exchange-value, of price, appears to be but pure monetary quantity. Nor do the dollar, etc., units of currency immediately reveal the 'ontological qualifier', the qualitative ontological determinations of the actuality which stands behind them, namely, *presently* socially-*necessary* human labor-time, the creative, productive investment of human life-time. Only the mediation of social, political-economic theory, i.e., of incipient social-reproductive science, emergent in the "law of value" insights of the works of, e.g., Adam Smith, David Ricardo, Benjamin Franklin, and, especially, of Karl Marx, can reveal this, awakening human awareness to the invisible, unconscious arbiter of its own collective behavior, of its societal reproductive process, within the capital-relation. The "pure-quantitative", reductionist mentality of capital's ideology, of the typical consciousness of capital's humanity, of capitals' science and capital's mathematics, finds its root-source -- and is generated and continually re-generated in and by -- this daily experience of the *pervasion* of exchange-value relationships, which *pervasion* characterizes capital-relation-based society far more comprehensively than it has any previous system / formation of 'human-social-relations-self-reproduction' or 'human-society-self-reproduction'.

Addendum.

Commentary on the 'Syntactical Mechanics' of the Initial 'Contra-Thesis' Arithmetic Of Dialectics. The syntactical mechanism which enables this 'Non-Standard Arithmetic' to provide its 'algorithmic «mimesis»' of the semantics of generic dialectics, is the '*subscriptal self-subsumption*' of the numerals of the "Standard Natural Numbers" Arithmetic to form the 'meta-numerals' of this first stage "Arithmetic of Dialectics". This 'self-subscriptization' of the "Naturals" is a syntactical manifestation of the immanently self-entailed 'self-«aufheben»' self-elevation -- of the self-negation «cum» self-conservation -- of the "Standard Natural Numbers" Arithmetic, driven on, by 'Gödel-incompleteness', to ever-higher levels of 'Gödel-incompleteness'.

This 'self-subscriptization' of the "Standard Natural" numerals is thus itself a syntactical interpretation or instantiation of the generic dialectical movement of dialectical, or self-«aufheben», negation. This self-«aufheben» 'self-subsumption' of "Standard Natural Numbers" numerals in the formation of the first-born Dialectical Arithmetic's 'meta-numerals' conserves "Standard Natural Numbers" arithmetic. That arithmetic continues to operate, for these new 'meta-numerals' or 'dialectors', at their subscript level, but, in the same process, qualitatively transforms arithmetic at their 'script[al]' level. 'Self-subsumption' transforms *qualitatively* that which subsumes itself. Consider, for example, a set which may be conceived as ever 'ingesting' itself to posit itself as a new member of itself, because it is defined to be the set which contains all sets as members of itself, so that this 'self-ingestion' becomes its 'definitional', 'essence-ial' act. It becomes thereby no longer the set that it was prior to that 'self-ingestion'. Such a set thereby transforms itself not only quantitatively, in terms of its cardinality and "logical type", but *qualitatively* as well. Such a set *transforms its very identity*. It 'meta-fractally' adds itself to itself -- forming a new, higher "*scale*" of itself -- by means of itself as a *whole* becoming a new *part* of itself, a new increment of 'ideo-ontology', "*similar*" to all of the earlier such self-additions, in the process of that definition-of-self-induced self-action/self-movement of 'self-subsumption', or of '*self-internalization*'. Because this set changes itself the moment that it internalizes itself in this way, becoming thereby a new, different, unprecedented set, it's membership does not yet include this new set that it has just become. Because this set is defined to be the set which contains *all* sets it must internalize *itself*, this new set that it now *is* -- again, and. . .again, and. . .again. . .

Thus, the various 'meta-numerals' or 'dialectors' of this 'Arithmetic of Dialectics' use ordinary "Natural" numerals as their subscripts, in a position "once removed" from the 'script[al]' level of these 'meta-numerals'. Those ordinary numerals represent abstract, "purely-quantitative" numbers, which differ from one another *only quantitatively*. But the result, at the 'scriptal' level and overall, of the 'subscriptization' of those 'pure quantifiers', is the formation of new entities, units, generic monads which differ from one another *only qualitatively* as a whole, i.e., when their 'sub-scriptal', 'scriptal', and 'super-scriptal' components are considered in their totality. They so differ precisely because the 'purely-quantitative' arithmetic of the "Standard Natural Numbers" continues to operate, unabated and fully-conserved, at their 'sub-scriptal' level. We arrive, by this 'self-subscriptization', at an arithmetical language of 'meta-Natural meta-Numbers', in which quantitative difference cannot even be expressed, given their idempotent addition. We arrive at an arithmetic, an algebra, a *calculus, of qualitative, ontological differences*, whose 'meta-numerals' model '*unquantifiable ontological qualifiers*', in contrast to the "Standard Natural Numbers", which model '*unqualified pure quantifiers*'.

In general, this '*subsumption via subscriptization*' syntactical/algorithmic version/model of "self-«aufheben»" or of "self-sublation", i.e., of *dialectical negation*, permeates the entire sequence of this 'meta-systematic' dialectic of successive, progressively more descriptively powerful, predecessor-supersuccessive, and, generally, '*quanto-qualitative*' -- or '*qualo-quantitative*' -- '*dialectical arithmetics*', which merely commences with this first-born, '*first contra-thesis*', '*qualifiers-only*', '*qualitative-only*' Arithmetic of Dialectics.

