‘«ARCHÉ» THESIS’:

“‘SYSTEM-atic DIALECTICS’”

[‘*Synchronic Dialectics*’]

Section I:

The Dialectic According to Plato –

The «Arithmoi Eidetikoi»

" STRANGER: Well, now that we have agreed that the kinds stand toward one another in the same way as regards blending, is not ***some science*** needed as a guide on ***the voyage of discourse***, if one is to succeed in pointing out which kinds are consonant, and which are incompatible with one another – also, whether there are certain kinds that pervade them all and connect them so that they can blend, and again, where there are divisions [separations], whether there are certain others that traverse wholes and are responsible for the division?

THEAETETUS: Surely ***some science*** is needed – ***perhaps the most important of all***.

STRANGER: And ***what name shall we give to this science***? Or – good gracious, Theaetetus, have we stumbled unawares upon ***the free man's knowledge*** and, in seeking for the Sophist, chanced to find ***the philosopher*** first?

THEAETETUS: How do you mean?

STRANGER: ***Dividing according to kinds***, not taking the same form for a different one or a different one for the same – is not that the business of ***the science of dialectics***?

THEAETETUS: Yes.

STRANGER: And the man who can do that discerns clearly ***one*** form everywhere extended throughout many, where each one lies apart, and ***many*** forms, different from one another, embraced from without by one form, and again ***one form connected in a unity through many wholes***, and ***many*** forms, entirely marked off apart. That means knowing how to distinguish, ***kind by kind***, in what ways the several kinds can or cannot combine.

THEAETETUS: Most certainly.

STRANGER: And the only person, I imagine, to whom you would allow this ***mastery of dialectic*** is the pure and rightful ***lover of wisdom***."

Plato, ***Sophist***, 253b – 254d [***emphasis*** added by F.E.D.]

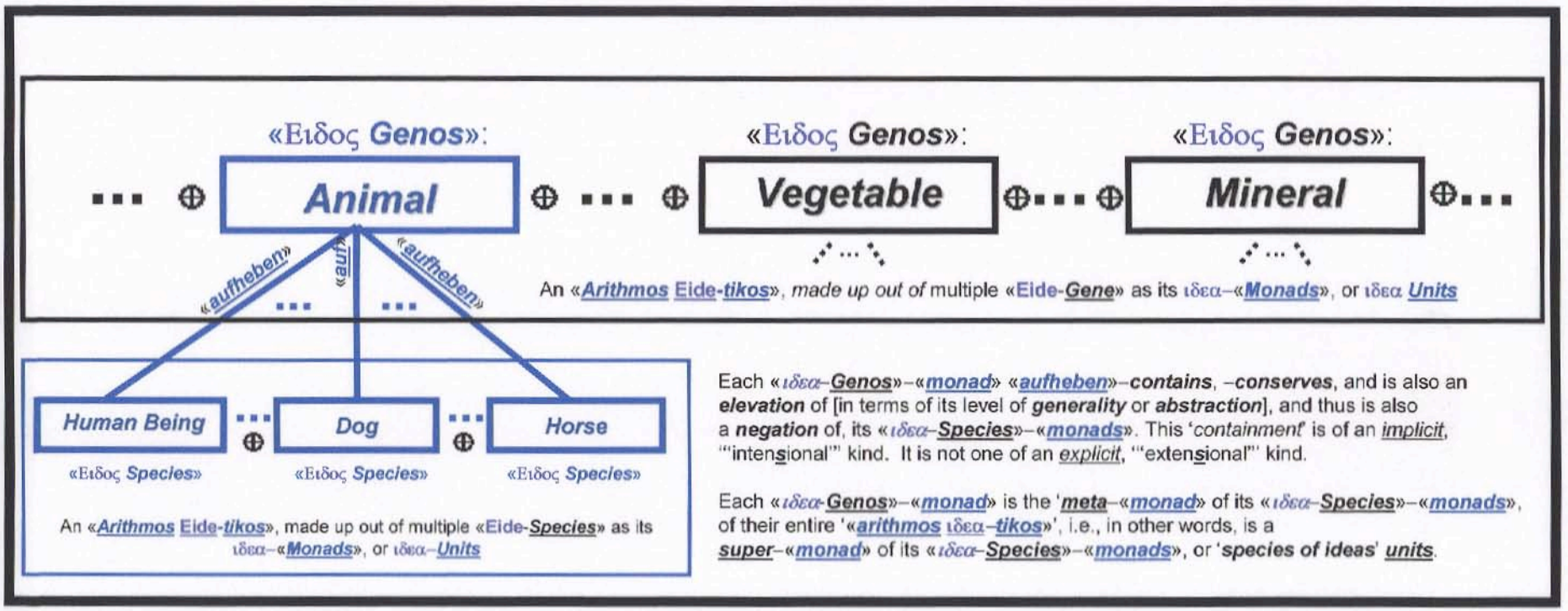
"...While the numbers with which the arithmetician deals, the ***arithmoi*** [assemblages of units — F.E.D.] ***mathematikoi*** or ***monadikoi*** [*abstract, generic*, idealized, *qualitatively-identical homogeneous* "monads" or [ideal[ized], abstract *qualitative units* — F.E.D.] are capable of being counted up, i.e., added, so that, for instance, eight ***monads*** [eight *abstract* ideal[ized]-***units***, ***unities***, or idea-***a***-*toms* — F.E.D.] and ten ***monads*** make precisely eighteen ***monads*** together, the ***assemblages*** of ***eide*** [of 'mental *seeings*' or mental *visions*; of "*ideas*" — F.E.D.], the "***arithmoi eidetikoi***" [*assemblages, ensembles*, "'sets'", or [***sub-***]***totalities*** of ***qualitatively different***, or ***heterogeneous***, *ideas* or «***eide***» — F.E.D.], cannot enter into any "community" with one another [i.e., are '***non-reductive***', "'***nonlinear***'", "*non-superpositioning*", "***non-additive***", '***non-addable***', or "***non-amalgamative***" — F.E.D.]. *Their* ***monads*** *are all* ***of different kind*** [i.e., are '***categorially***', ***ontologically***, ***qualitatively unequal*** — F.E.D.] and can be brought "together" only "partially", namely only insofar as they happen to ***belong*** to one and the same assemblage, whereas insofar as they are "entirely bounded off" from one another...they are incapable of being thrown together, ***in-comparable*** [incapable of being *counted* as replications of the same quality of ***unit***[y], of the same ***qualitative unit***, or ‹‹***monad***››; incomparable *quantitatively* — F.E.D.] ... .The ***monads*** which constitute an "***eidetic number***", i.e., ***an assemblage of ideas***, are nothing but a conjunction of *eide* which ***belong together***. They ***belong together*** because they belong to one and the same *eidos* [singular form of «***eide***»: *one particular 'internal / interior* ***seeing***', *vision*, or «*ιδεα*» — F.E.D.] *of a* ***higher order***, namely a "class" or *genos* [akin to the grouping of multiple ***species*** under a single ***genus*** in classical biological "'taxonomics'" or "'systematics'" — F.E.D.]. But all will together be able to "partake" in this ***genos*** (as for instance, "human being", "horse", "dog", etc., partake in "animal") *without "partitioning" it among the* (***finitely***) *many eide and without losing their indivisible unity only if the genos itself exhibits the mode of being of an* ***arithmos*** [singular form of «***arithmoi***»: a single assemblage of ***units***/«***monads***» — F.E.D.]. Only the ***arithmos*** structure with its special *koinon* [commonality — F.E.D.] character is able to guarantee the essential traits of the community of *eide* demanded by ***dialectic***; the indivisibility [***a-tom***-icity or '***un-cut***-ability' — F.E.D.] of the single "***monads***" which form the ***arithmos*** *assemblage*, the limitedness of this ***assemblage of monads*** as expressed in the joining of many ***monads*** into one assemblage, i.e., into one idea, and the *untouchable* ***integrity*** *of this* ***higher idea*** *as well*. What the single *eide* have "in common" is theirs only *in their community* and is not something which is to be found "beside" and "outside"...them. ...The unity and determinacy of the ***arithmos*** *assemblage* is here rooted in the ***content*** of the idea..., that ***content*** which the *logos* [*word; rational speech; ratio* — F.E.D.] reaches in its characteristic activity of uncovering foundations "***analytically***". A special kind of [*all-of-****one-kind****, generic-units-based* — F.E.D.] number of a particular nature is not needed in this realm, as it was among ***the dianoetic numbers*** [the «***arithmoi monadikoi***» — F.E.D.]..., to provide a foundation for this ***unity***. In fact, it is impossible that any kinds of number corresponding to those of ***the dianoetic realm*** [*the realm of 'dia-noesis' or of '«dianoia»', i.e., of 'pre-/sub-dialectical' thinking* — F.E.D.] should exist here, since each ***eidetic number*** *is*, by virtue of its ***eidetic character*** [«***eide***»-*character* or *idea-nature* — F.E.D.], ***unique in kind*** [i.e., *qualitatively* unique / distinct / ***heterogeneous*** in comparison to other «***eide***» — F.E.D.], just as each of its "***monads***" has not only ***unity*** but also ***uniqueness***. For each idea is characterized by being always the same and simply ***singular*** [∴ *additively* ***idempotent***, and ∴ also '***un****quantifiable*' — F.E.D.] in contrast to the unlimitedly many *homogeneous* ***monads*** of the realm of mathematical number, which can be rearranged as often as desired into definite numbers. ...The "pure" mathematical ***monads*** are, to be sure, differentiated from the single objects of sense by being outside of change and time, but they are not different in this sense — that they occur in ***multitudes*** ***and are of the same kind*** (Aristotle, Metaphysics B 6, 1002 b 15 *f.*: [Mathematical objects] differ not at all in being ***many*** and of the ***same kind***...), whereas each *eidos* is, by contrast, ***unreproducible*** [*hence modelable by idempotent addition, or '****non****-addability', and '****non****-quantifiability'* — F.E.D.] and truly *one* (Metaphysics A 6, 987 b 15 *ff.*: "***Mathematical objects*** differ from ***objects of sense*** in being everlasting and unchanged, from ***the eide***, on the other hand, in being many and alike, while ***an*** *eidos* ***is each by itself one only***"...). In consequence, as Aristotle reports (e.g., Metaphysics A 6, 9876 b 14 *ff.* and N 3, 1090 b 35 *f.*), there are ***three kinds of arithmoi***: (1) the ***arithmos eidetikos*** — ***idea-number***, (2) the *arithmos aisthetos* — sensible number, (3) and "between"...these, the ***arithmos*** *mathematikos* or ***monadikos*** — mathematical and ***monadic number***, which shares with the first its "purity" and "changelessness" [here Aristotle reflects only the early, more 'Parmenidean', Plato, not the later, «***autokinesis***» Plato — F.E.D.] and with the second its manyness and reproducibility. Here the "***aisthetic***" ["*sensible*", i.e., 'sense-able', or ***sensuous*** — F.E.D.] ***number*** represents nothing but the things themselves which happen to be present for ***aisthesis*** [*sense perception* — F.E.D.] in this number. The mathematical numbers form an independent domain of objects of study which the ***dianoia*** [*the faculty of 'pre-/sub-dialectical thinking'* — F.E.D.] reaches by noting that its own activity finds its exemplary fulfillment in "reckoning [i.e., account-giving] and counting".... The ***eidetic number***, finally, indicates the *mode of being of the* ***noeton*** [that which exists "***for***" *thought*; *that which thought "beholds"; the object of thought*; the ***idea***[***l***]***-object*** — F.E.D.] *as such — it defines the* eidos ***ontologically*** *as a being which has* ***multiple relations*** *to other* eide ***in accordance with their particular nature*** [i.e., *in accord with their* ***content*** — F.E.D.] *and which is nevertheless in itself altogether* ***indivisible***. ***The Platonic theory*** of the ***arithmoi eidetikoi*** is ***known*** *to us in these terms* ***only from the Aristotelian polemic against it*** (*cf.*, above all, Metaphysics M 6-9)..."

Jacob Klein, ***Greek Mathematical Thought and the Origin of Algebra***, 1934-1936, pp. 89-91.
[**bold**, *italic*, underline, and color emphasis added by F.E.D.]

Synchronic «***Aufheben***» Structure of ***The Platonic Dialectic*** of the «***Arithmoi Eidetikoi***»

Visualized Below --

«*Arithmoi* Eide-*tikoi*» formed by an «*Arithmos* Eide-*tikos*» of «Eide-*Gene*»–«*Monads*» together with a [connected] «*Arithmos* Eide-*tikos*» of «Eide-*Species*»–«*Monads*»:

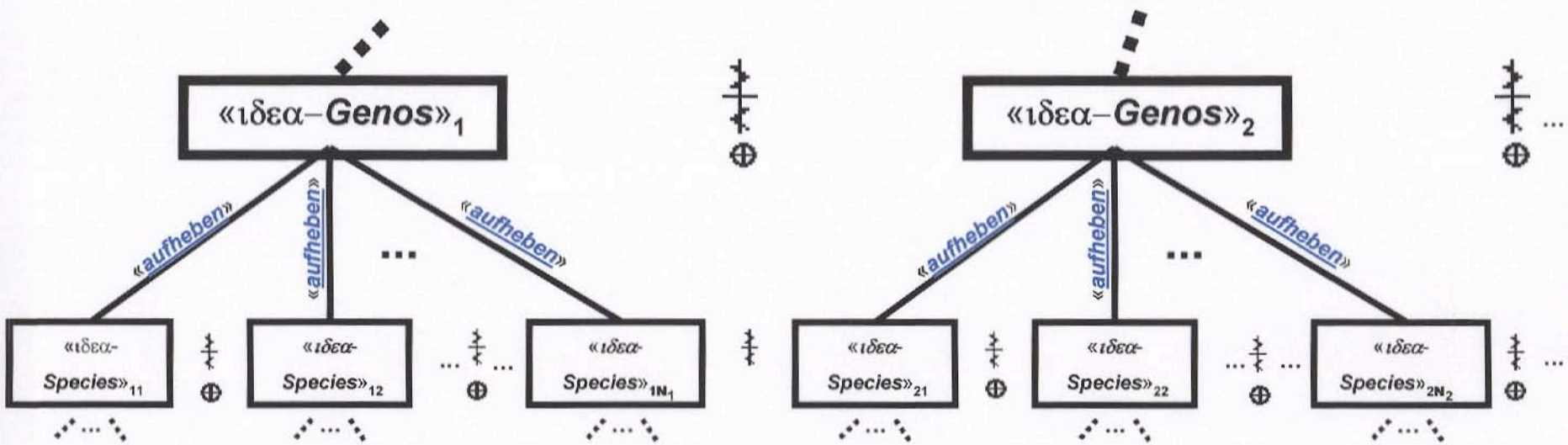


This depiction of an «*Arithmoi Eidetikoi*» is based upon the example invoked in Jacob Klein's book *Greek Mathematical Thought and the Origin of Algebra*, from the quote exhibited in the preceding slide. Two key F.E.D. definitions, relevant throughout that passage, and throughout this presentation, are also supplied below:

"'*Ontology*'" [«*Onto*»–«*Logy*»: "'being–knowledge'"; "'discourse about being'"] ≡ The knowledge of, or the ***word***-*narrated* [«*Logos*»] accounting for / description of, the kinds of ***being*** [«*On*»] that are "'*be*-ing'", that are *extant*, or *existent*, in any given moment, or epoch, of the history of the finite, manifest being / existence of this «*kosmos*», including both '*physio*–being', or «*physis*»-being, and also human–'***phenomic***' «*ideo*»-being, or «ιδεα»-being, i.e., including human–cultural / "'***memetic***'" "*idea*–objects", or "'*idea*–matter'", with the [ideo-]"'materiality'" of such "idea-objects" grasped in accord with the principles of the F.E.D. perspective, of "'*Psycho*-Historical Materialism'".

"'*Ontodynamics*'" [«*Onto*»–«*Dynamis*»: "'being-*potential*'"; "'being–*power*'"; "'being-*change*'"; "'*change* of being'"; "'*power* of being to change [itself, and other being]'"] ≡ Emergence of new, *successor* ***kinds of being*** – of new «***species***», and new «***gene***», of being, etc. – of higher "'***power***'"; of higher "'***degree***'"; of higher intrinsic "'***dimensionality***'", relative to that of their *predecessor* ***kinds of being***, from out of the *inter*action, and from out of the "'***intra***-action'", of the «***monads***» of the «***arithmoi***» of their *predecessor* ***kinds of being***; i.e., of ***kinds*** of ***being*** of lower "'***power***'", "'***degree***'", or inner "'***dimensionality***'".

Synchronic «***Aufheben***» Diagram: '***Meta-Fractal***' 'Meta-Monadology' of the Platonic «***Arithmoi Eidetikoi***» Dialectic



The diagram above depicts an excerpt from the synchronic, and purportedly transcendental, static, eternal, & immutable, '"Noetic Realm"' of Plato's «***Eide***», or «*ιδεα*», the 'Parmenidean' realm of his imagined ***Dialectical*** «***Arithmoi Eide-tikoi***». If we take the «*ιδεα*»-«***Species***», belonging to a given «*ιδεα*»-«***Genos***», as the base-level ***units***, or «***monads***», of the various «***Species***»-«***Arithmoi*** [***Eidetikoi***]», then the «***Genos***» to which they belong maintains a [synchronic] «***aufheben***» relationship to those «***Species***», and is their immediate '***meta***^{1}-***unit***', or '***meta***^{1}-«***monad***»'. I.e., each «*ιδεα*»-«***Genos***» is ['"intension-ally"'] '"made up out of"' the heterogeneous multiplicity – the «***Arithmos***» – of its «***idea***»-«***Species***». This means that each «*ιδεα*»-«***Genos***» is, simultaneously and univocally, an "intensional" (1) ***negation***, an (2) ***elevation***, and a (3) ***conservation*** / ["intensional"] ***containment*** of its «*ιδεα*»-«***Species***». Thus, the higher «***Arithmos***» of the «*ιδεα*»-«***Gene***» is a '***meta***^{1}-«***Arithmos***»' of the «***Arithmoi***» of their «*ιδεα*»-«***Species***». The '"Noetic Space"' of the «***Arithmoi Eidetikoi***», or «***Arithmoi Noetikoi***» -- depicted, in excerpt, above -- is also the '"space"' in which the logic of the classical – and Hegelian – '"[statical] ***disjunctive syllogism***"' operates [see Hegel, «***Logik***», Vol. II, *Subjective Logic*; Sec. 1, *Subjectivity*; Ch. 3, *The Syllogism*; C., *The Syllogism of Necessity*; (c)].

"'Anti-Reductionist'" Representation of the last slide's Rudimentary, «*ιδεα*-***Genos***»/«*ιδεα*-***Species***» portion of the Structure of the 'Philosophical Ideo-Systematics' of Plato's «***Arithmoi Eidetikoi***» "'Systematic Dialectics'", using one of the systems of "'dialectical arithmetic'" arising in the 'meta-systematic-dialectical' progression of the F.*E*.*D*. "'dialectical arithmetics'", generated by $[\,\underline{\underline{\mathbf{N}}}\,]^{2^{\tau}} \leftrightarrow [\,\underline{\mathbf{q}}_1\,]^{2^{\tau}}$ as the 'self-reflexion countor', τ, increases.

The rudimentary, Platonic «*ιδεα*-***Genos***»/«*ιδεα*-***Species***» structure of the 'Philosophical Ideo-Systematics' of Plato's «***Arithmoi Eidetikoi***» "'Systematic Dialectics'" can be expressed "'arithmetically'", via one of the purely-qualitative, purely-ontological, and "non-addible" 'higher meta-numbers' that arises in the 'meta-systematic-dialectical' arithmetical-systems-progression of the F.*E*.*D*. 'dialectical ideographies'.

Requisite capability-of-expression first arises in the rules-system / ideographic language of the ${}_{\mathbf{N}}\underline{\mathbf{q}}_{\mathrm{BA}}$ space of these "'dialectical arithmetics'".

This rules-system corresponds to the generic ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ 'meta-number' $\underline{\mathbf{q}}_{24}$ in the ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ dialectical model of that systems-progression, i.e., as expressed in the language of the 2nd "'space'", or "set", of the "'spaces'" of the "'dialectical arithmetics'", denoted by ${}_{\mathbf{N}}\underline{\mathbf{Q}}$, defined as ${}_{\mathbf{N}}\underline{\mathbf{Q}} \equiv \{\underline{\mathbf{q}}_1, \underline{\mathbf{q}}_2, \underline{\mathbf{q}}_3, \ldots\}$. The arithmetic of the ${}_{\mathbf{N}}\underline{\mathbf{q}}_{\mathrm{BA}}$ "'space'" is a '***purely-qualitative***' arithmetic, as signified by the fact that the subscript of $\underline{\mathbf{q}}_{24}$ is an ***even*** number. The arithmetics in this progression which, per this ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ model, correspond to ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ 'meta-numbers' with ***odd*** number subscripts, are either explicitly '***quanto-qualitative***' arithmetics, or, in the single case of the arithmetic which corresponds to $\underline{\mathbf{q}}_1$, is a '***purely-quantitative***' arithmetic.

The rules-system / ideographical language of the familiar arithmetic of the Natural Numbers, the numbers whose "'space'", or "set", is denoted by $\mathbf{N}$, defined as $\mathbf{N} \equiv \{1, 2, 3, \ldots\}$, corresponds to the generic 'meta-number' $\underline{\mathbf{q}}_1$ in that same ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ model of this 'meta-system-atic', dialectical progression of systems of "'dialectical arithmetic'".

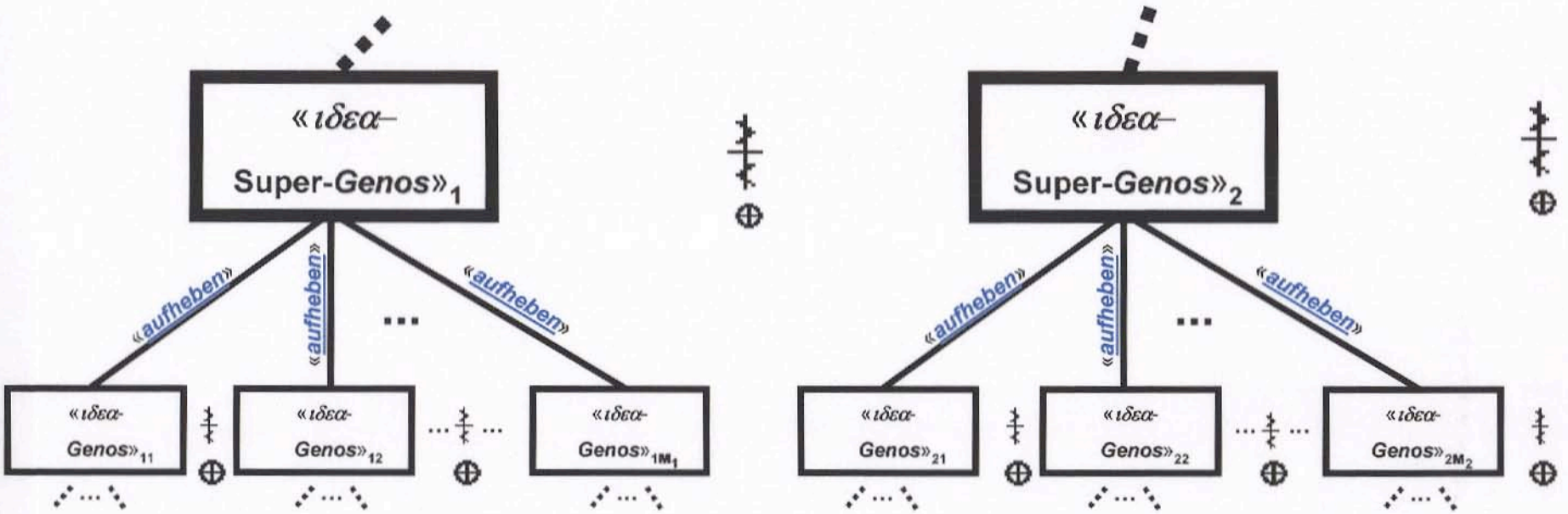
The ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ rules-system itself corresponds to the generic 'meta-number' $\underline{\mathbf{q}}_2$ in that ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ model.

The generic unit, or «***monad***» -- or, more specifically, the generic '***meta***^{1}-unit', or '***meta***^{1}-«***monad***»' -- of the ${}_{\mathbf{N}}\underline{\mathbf{q}}_{\mathrm{BA}}$ arithmetic involves one explicit use of a higher arithmetical operation of 'non-amalgamative', "'anti-reductionist'", '***purely-qualitative division***', or of '***purely-ontological division***', and looks as below, if we tailor it to, say, a count of «*ιδεα*-***species***» equal to the number represented by $\mathbf{N}_1$. The single "beta" unit, in the numeral below, is designed to assert, via the '***qualitative division bar***' below it, that it is implicitly "'made up out of'", and "'divisible'" into, the multiple "alpha" units below that '***qualitative division bar***', at a lower/lesser level of abstraction / '«***gen***»-eralization'. This 'meta-fractal levels/scales separator bar' stands for the boundary between the «*ιδεα*-***genos***» level and the «*ιδεα*-***species***» level --

$$\left(\frac{\widehat{\beta}_1}{\widehat{\alpha}_{11} \oplus \ldots \oplus \widehat{\alpha}_{1\mathbf{N}_1}} \right).$$

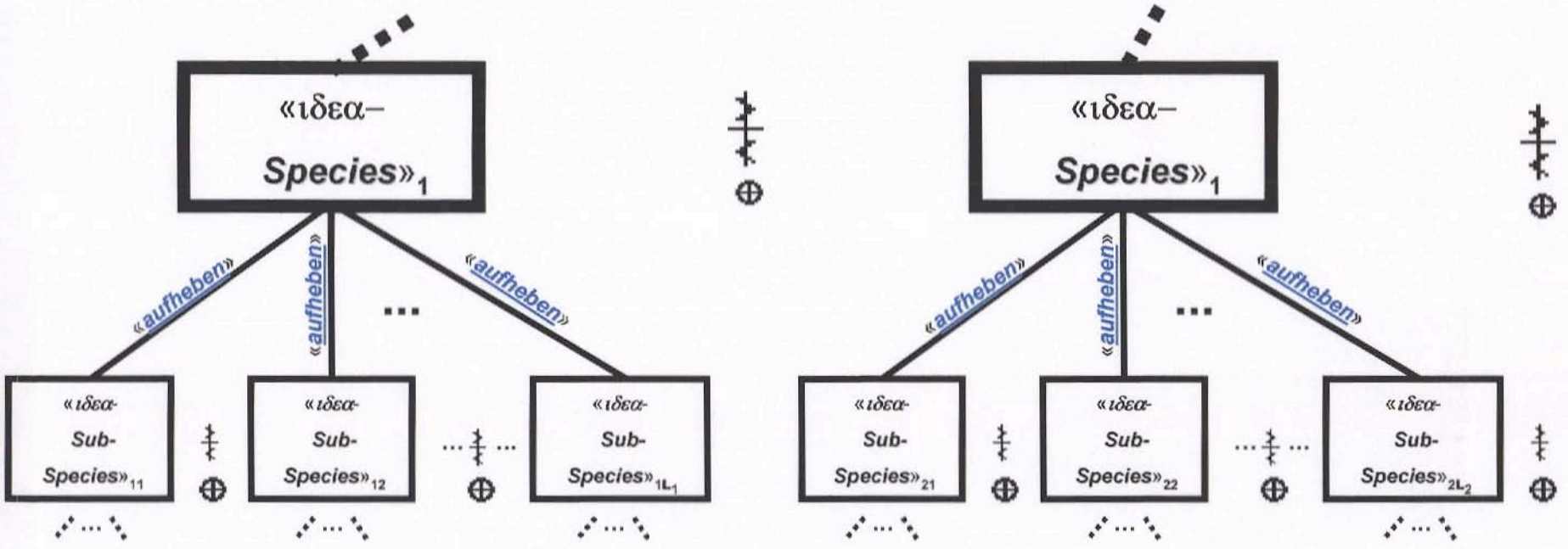
In this compound 'meta-number', the "beta", and the "alphas", represent "'purely-qualitative'", or 'purely-ontological', "'subsumed-unit'", or "'sub-unit'", 'meta-numbers'. The "beta" 'meta-numeral' represents a '«***genos***» -qualifier', which here represents a «***genos***» unit that has been assigned as "'«***genos***» number one'". The "alpha" 'meta-numerals' are assigned, in this case, as '«***species***»-qualifiers', with the "alpha" subscripted by "11" being assigned to the stipulated first «***species***» of «***genos***» # 1, and with the "alpha" subscripted by "$\mathbf{1N}_1$" assigned to the "$\mathbf{N}_1$th", stipulated last species of «***genos***» # 1, and with the ellipsis dots, "...", standing for any/all «***species***» belonging to «***genos***» # 1 that are assigned to [the] [any] "**N**atural" Numbers between "1" and "$\mathbf{N}_1$". The '$\oplus$' addition, e.g., of each "alpha" to its consecutive next "alpha", denotes a "'non-amalgamative'" generalization of $\mathbf{N}$ addition, per which these "'qualitatively different'", 'ontologically-different', "'different ***in kind***'" '«***species***»-qualifiers', represented by "alphas" of differing subscript, do not "amalgamate" into any single value, within their own level of concreteness, just as an "apple" "+" an "orange" do not add amalgamatively, or "'reductively'", within heir own scale of specificity. Only at the «***genos***» level, of lesser specificity, "above" the «***species***» level, do the multiple «***species***» coalesce in the singular, «***genos***», value, just as "apple plus orange", abstracted to "fruit" yields "fruit plus fruit equals fruit". The "alphas" stand for 'pure qualifiers', versus the 'pure, unqualified quantifiers' for which **N**-type numerals stand, so that the "alphas" are "non-addible", or 'unquantifiable'.

Synchronic «***Aufheben***» Diagram: «***Gene***»/Super-«***Genos***» 'Meta-Monadology' of the Platonic «***Arithmoi Eidetikoi***» Dialectic



The diagram above depicts an excerpt from the synchronic -- and purportedly transcendental and ***Parmenidean***, static, eternal, and immutable – '"Noetic Domain"' of Plato's «***Eide***», or «*Ιδεα*»: the realm of Plato's ***Dialectical*** «***Arithmoi Eide-tikoi***». If we take each «*ιδεα*»-«***Genos***» -- belonging, by virtue of its ***idea-content***, to a given «*ιδεα*»-***Super***-«***Genos***» -- as a base-level ***unit***, or «***monad***», of its «***Gene***»-«***Arithmos*** [***Eidetikos***]», then the associated ***Super***-«***Genos***» to which it belongs maintains a [synchronic] «***aufheben***» relationship to it together with its 'contentally-associated' «***Gene***», and is their immediate '***meta***^{1}-***unit***', i.e., is their '***meta***^{1}-«***monad***»'. That is, each «*ιδεα*»-***Super***-«***Genos***» is '"made up out of"' the heterogeneous multiplicity – the «***Arithmos***» -- of its «*ιδεα*»-«***Gene***». This means that each «*ιδεα*»-***Super***-«***Genos***» is, simultaneously, and univocally, an "intensional" (**1**) ***negation***, by way of being also (**2**) an ***elevation***, and thereby also (**3**) a ***conservation*** / ***containment*** of its 'contentally-associated' «*ιδεα*»-«***Gene***». Thus, the higher «***Arithmos Eidetikos***» to which each «*ιδεα*»-***Super***-«***Genos***» belongs is a '***meta***^{1}-«***Arithmos Eidetikos***»' with respect to the «***Arithmos Eidetikos***» of their '"own"', 'contentally-associated' «*ιδεα*»-«***Gene***», in the '"*Philosophical Systematics*"' of Plato's '"*Taxonomy of Universal Ideas*"', '"*Categorial Cosmos*"', or '*Meta-Genealogy / Phylogenetic Tree' of the Philosophical Concepts*.

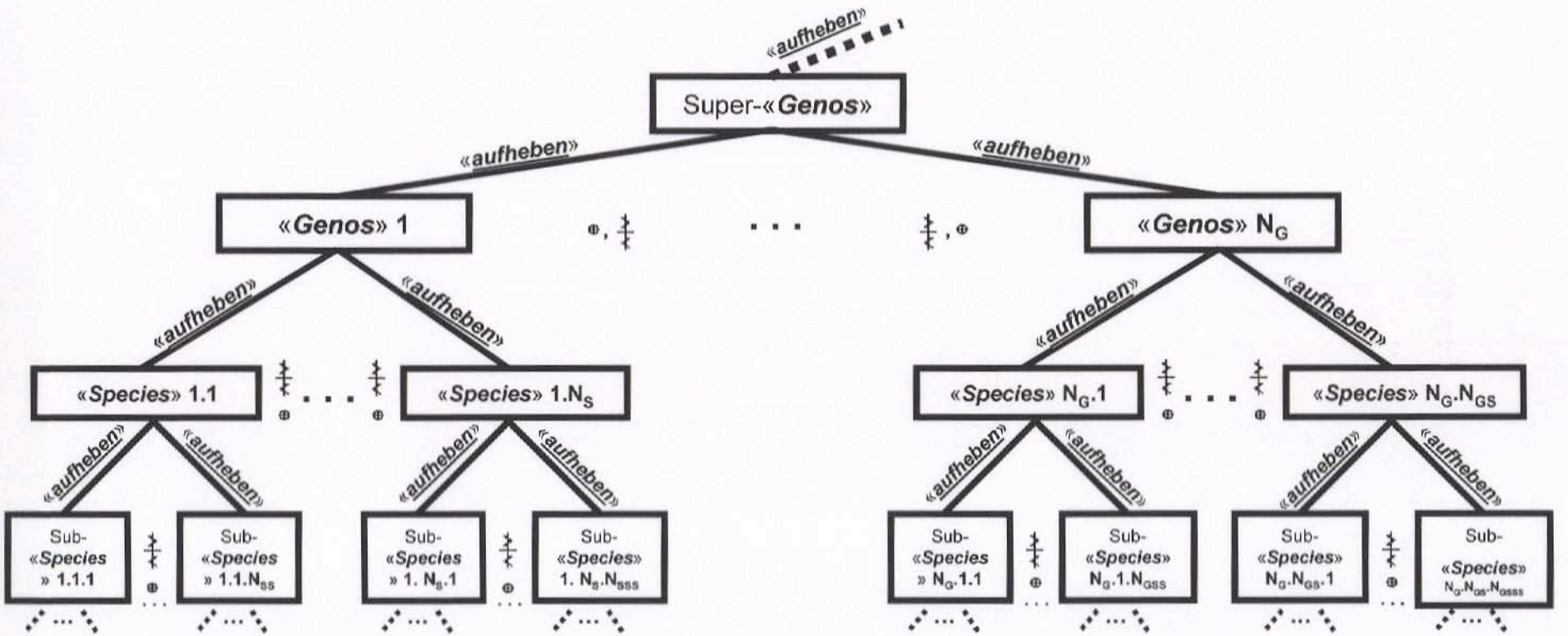
Synchronic «***Aufheben***» Diagram: «***Species***» / ***Sub***-«***Species***» 'Meta-Monadology' of the Platonic «***Arithmoi Eidetikoi***» Dialectic



The diagram above depicts an excerpt from the synchronic -- and purportedly transcendental and ***Parmenidean***, static, eternal, and immutable – "'Noetic Domain'" of Plato's «***Eide***», or «*Ιδεα*»: the realm of Plato's ***Dialectical*** «***Arithmoi Eide-tikoi***». If we take each «*ιδεα*»-***Sub***-«***Species***» -- belonging, by virtue of its ***idea-content***, to a given «*ιδεα*»-«***Species***» -- as a base-level ***unit***, or «***monad***», of its «***Species***»-«***Arithmos* [*Eidetikos*]**», then the associated «***Species***» to which it belongs, by virtue of its "'*idea-content*'", maintains a [synchronic] «***aufheben***» relationship to it together with its other 'contentally-associated' ***Sub***-«***Species***», and this «*ιδεα*»-«***Species***» is their immediate '***meta***^{1}-***unit***', or '***meta***^{1}-«***monad***»'. I.e., each «*ιδεα*»-«***Species***» is "'made up out of'" the heterogeneous multiplicity – the «***Arithmos***» -- of its «*ιδεα*»-***Sub***-«***Species***». This means that each «*ιδεα*»-«***Species***» is, simultaneously, and univocally, a (**1**) ***negation***, by way of being also (**2**) an ***elevation***, and thereby also (**3**) a ***conservation*** / ***containment*** of its 'contentally-associated' «*ιδεα*»-***Sub***-«***Species***». Thus, the higher «***Arithmos Eidetikos***» to which each «*ιδεα*»-«***Species***» may belong is a '***meta***^{1}-«***Arithmos Eidetikos***»' relative to the «***Arithmos Eidetikos***» of their "'own'", 'contentally-associated' «*ιδεα*»-***Sub***-«***Species***», in the "'*Philosophical Systematics*'" of Plato's "'*Taxonomy of Universal Ideas*'", "'*Categorial Cosmos*'", or '*Meta-Genealogy' of the Philosophical Concepts*.

Synchronic «***Aufheben***» Diagram:

. . . ***Super***-«***Genos***» / «***Genos***» / «***Species***» / ***Sub***-«***Species***» . . . 'Meta-Fractal Meta-Monadology' of Platonic «***Arithmoi Eidetikoi***» Dialectics



"'Anti-Reductionist"' 'Meta-Numeral' symbolizing last slide's «*ιδεα*-Super-***Genos***»/«*ιδεα*-***Genos***»/«*ιδεα*-***Species***»/«*ιδεα*-Sub-***Species***» Structure

from the 'Philosophical Ideo-Systematics' of Plato's «***Arithmoi Eidetikoi***» "'Systematic Dialectics"',

using one of the systems of "'dialectical arithmetic"' arising in the 'meta-systematic-dialectical' progression of the F.*E*.*D*. "'dialectical arithmetics"',

modeled by $[\,\underline{\underline{\mathbf{N}}}\,]^{2^{\tau}} \leftrightarrow [\,\underline{\mathfrak{q}}_1\,]^{2^{\tau}}$ as the 'self-reflexion countor', τ, increases.

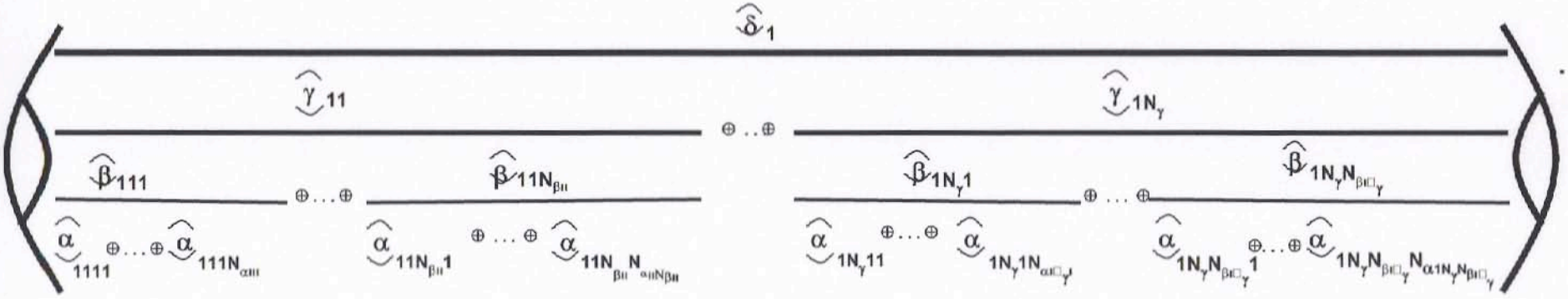
The ramified, Platonic «*ιδεα*-Super-***Genos***»/«*ιδεα*-***Genos***»/«*ιδεα*-***Species***»/«*ιδεα*-Sub-***Species***» Structure, excerpted from the 'Philosophical Ideo-Systematics' of Plato's «***Arithmoi Eidetikoi***» "'Systematic Dialectics"', can be expressed "'arithmetically"', via one of the purely-qualitative, purely-ontological, and "non-addible" 'higher meta-numbers' that arises in the 'meta-systematic-dialectical' arithmetical-systems-progression of the F.*E*.*D*. "'dialectical arithmetics"'. Complicated "'algebraic"' subscripts are required to represent this 'meta-number' ***generically***.

Requisite capability-of-expression first arises in the rules-system/ideographic language of the ${}_{\mathbf{N}}\underline{\mathfrak{q}}_{\Delta\Gamma BA}$ "'space"' of these "'dialectical arithmetics"'.

This rules-system corresponds to the generic ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ 'meta-number' $\underline{\mathfrak{q}}_{120}$ in the ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ dialectical model of that systems-progression, i.e., as expressed in the language of the **2**nd "'space"', or "set", of the "'spaces"' of the "'dialectical arithmetics"', denoted by ${}_{\mathbf{N}}\underline{\mathbf{Q}}$, defined as ${}_{\mathbf{N}}\underline{\mathbf{Q}} \equiv \{\underline{\mathfrak{q}}_1, \underline{\mathfrak{q}}_2, \underline{\mathfrak{q}}_3, \ldots\}$.
The arithmetic of the ${}_{\mathbf{N}}\underline{\mathfrak{q}}_{\Delta\Gamma BA}$ "'space"' is a '***purely-qualitative***' arithmetic, as signified by the fact that the subscript of $\underline{\mathfrak{q}}_{120}$ is an ***even*** number. The arithmetics in this progression which, per this ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ model, correspond to ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ 'meta-numbers' with ***odd*** number subscripts, are either explicitly '***quanto-qualitative***' arithmetics, or, in the single case of the arithmetic which corresponds to $\underline{\mathfrak{q}}_1$, is a '***purely-quantitative***' arithmetic.

The rules-system / ideographical language of the familiar arithmetic of the **N**atural Numbers, the numbers whose "'space"', or "set", is denoted by **N**, defined as $\mathbf{N} \equiv \{1, 2, 3, \ldots\}$, corresponds to the generic 'meta-number' $\underline{\mathfrak{q}}_1$ in that same ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ model of this 'meta-system-atic', dialectical progression of systems of "'dialectical arithmetic"'.

The ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ system itself corresponds to the generic 'meta-numeral' $\underline{\mathfrak{q}}_2$ in that ${}_{\mathbf{N}}\underline{\mathbf{Q}}$ model. The generic unit, or «***monad***», 'meta-numeral' of ${}_{\mathbf{N}}\underline{\mathfrak{q}}_{\Delta\Gamma BA}$ is:



So as to represent the structure of the last slide, the "alphas" in this 'meta-numeral' would be assigned to the «*ιδεα*-Sub-***Species***», the "betas" to the «*ιδεα*-***Species***», the "gammas" to the «*ιδεα*-***Gene***», and the single "delta" to the singular/unitary «*ιδεα*-Super-***Genos***» shown there.

Section II:

Some Examples of

'[*Synchronic*] ‹‹***Aufheben***›› ***Structures***',

of '***Meta-Monadologies***',

of '[*Qualo-*]***Peanic Consecua***',

&

of '***Meta-Fractal Scaling***'

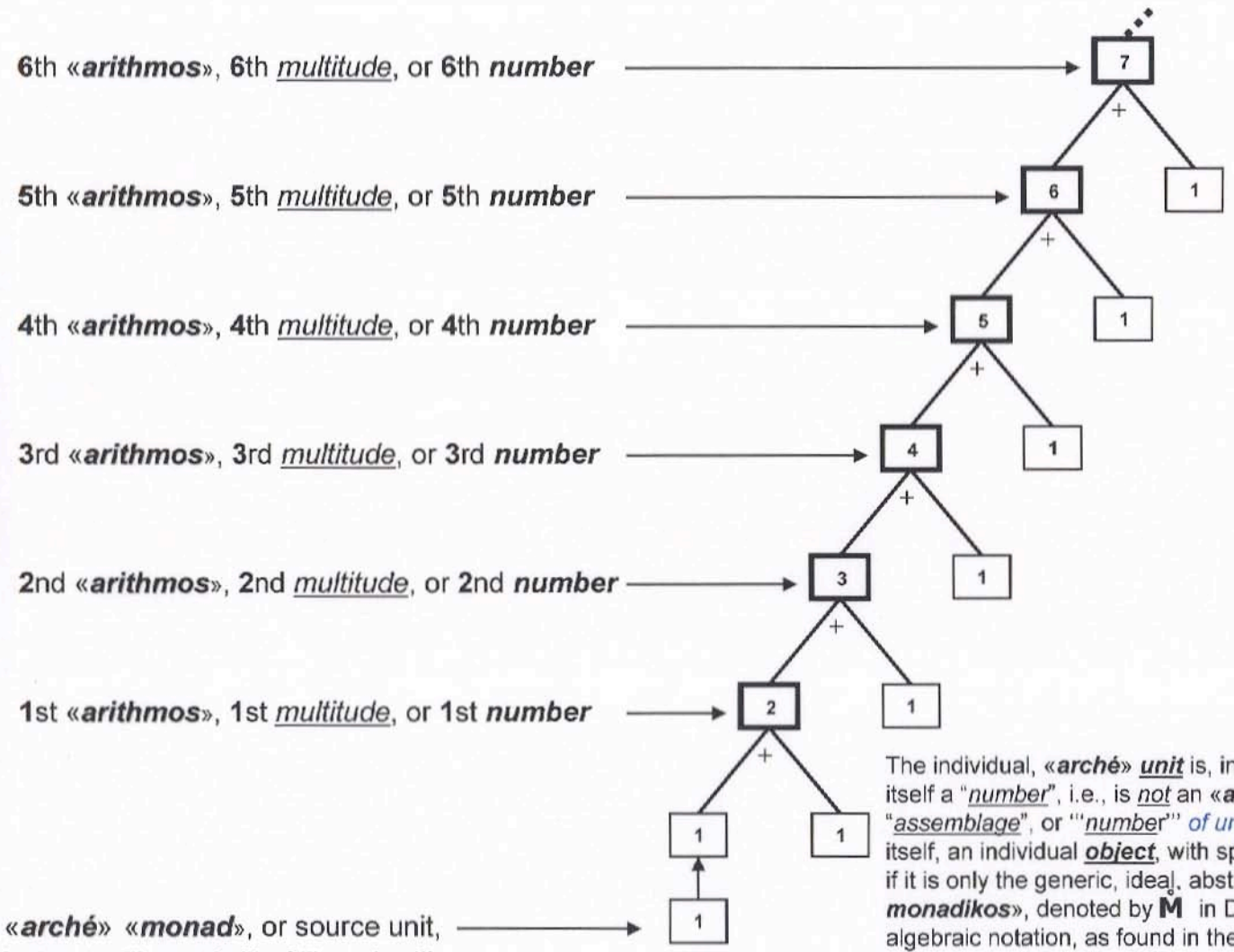
'*Meta-Monadology*'

" By a '***Meta-Monadology***', we mean a progression of ‹‹***arithmoi***›› -- self-presenting, or presented -- wherein each of the ‹‹***monads***››, or ***units***, of each *successor* ‹‹***arithmos***›› is constructed from a determinate multiplicity – typically a ***heterogeneous*** one – of the ***units***, or ‹‹***monads***››, of its immediate *predecessor* ‹‹***arithmos***››, per the *order of presentation* of these ‹‹***arithmoi***››, so that the ‹‹***monads***›› of that *successor* ‹‹***arithmos***›› are '**meta**^{1}-‹‹***monads***››', or '**meta**^{1}-***units***', relative to the ‹‹***monads***››, or ***units***, of that *predecessor* ‹‹***arithmos***››.

This entails a '*meta-finite*' relationship, and one of ontological, *qualitative*, ***not*** quantitative, *inequality*, between these *successor* and *predecessor* ‹‹***monads***››, or ***units***. Moreover, this *predecessor-successor* relationship instantiates a [***self***-]‹‹***aufheben***›› operation, and a [self-]‹‹***aufheben***›› relation, constructing, and connecting, respectively, each *successor* ‹‹***arithmos***›› from, and to, its *predecessor*. This *predecessor-successor* relationship also makes the total progression a '[*Qualo*]-*Peanic Consecuum*', or *Sequence*, of [self-]formations / [self-]constructions. That total progression thus assembles a '[*quanto*-]***qualitative*** *self-similarity regress*' structure, which we term a '*meta-fractal*'."

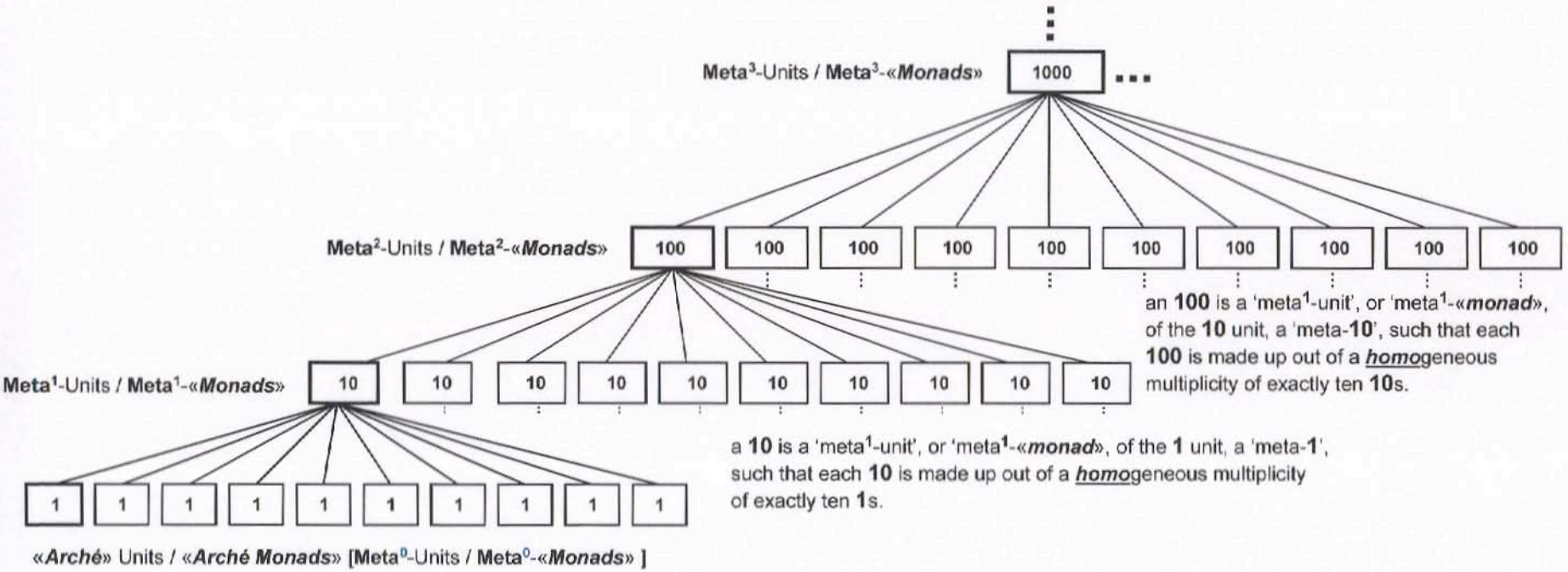
Karl Seldon, *Encyclopedia Dialectica*, ***Prolegomena***

«***Aufheben***» Diagram: The "'Fractal"', '*Peanic*' 'Meta-«***Arithmos***»-ology' of the "**N**atural" Numbers

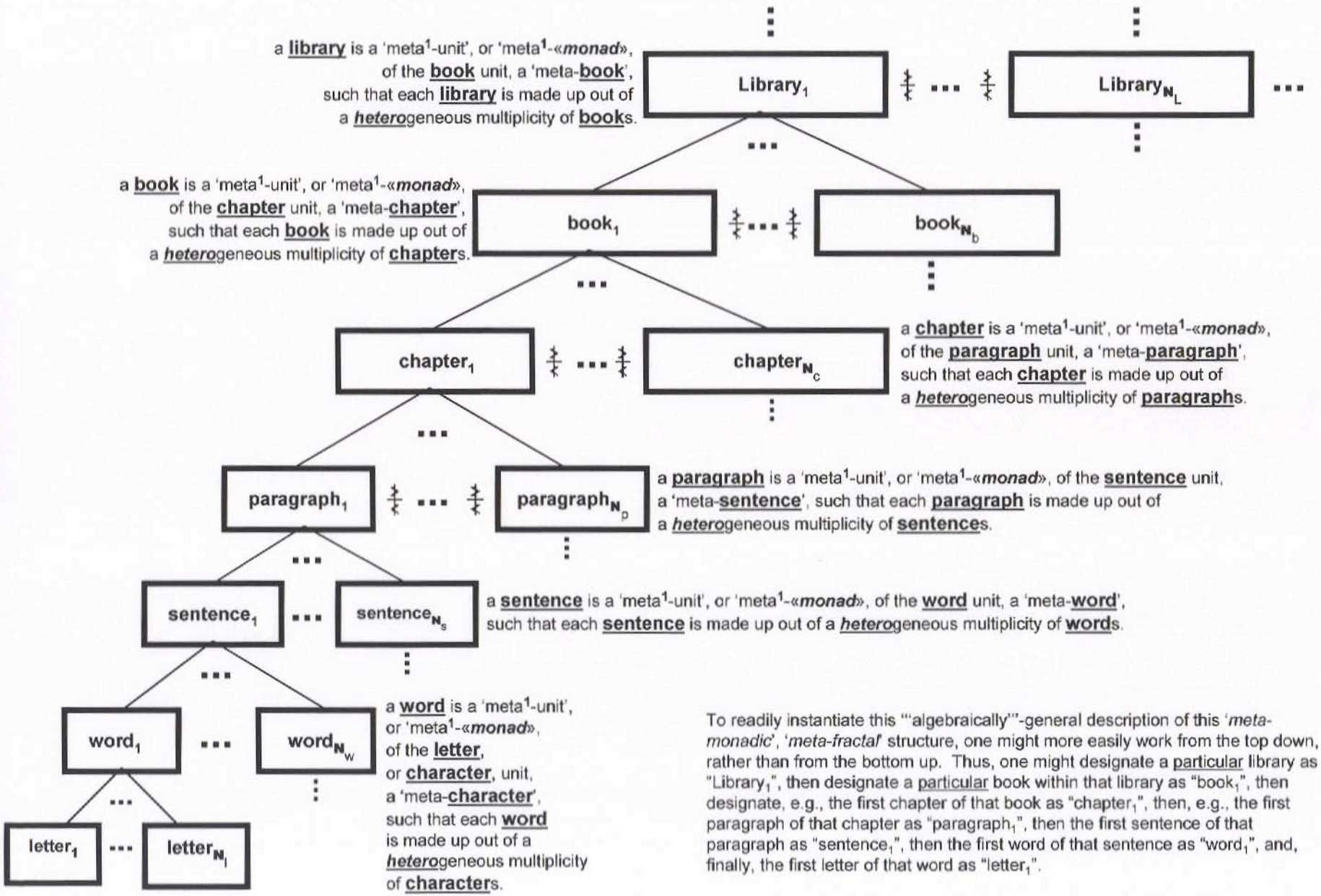


The individual, «***arché***» ***unit*** is, in the *ancient* Greek view, *not* in or by itself a "*number*", i.e., is *not* an «***arithmos***» -- is *not* any "*multitude*", or "*assemblage*", or "'*number*"' *of units*. The ***unit***, or «***monad***», is, by itself, an individual ***object***, with specific and individual ***qualities***, even if it is only the generic, ideal, abstract ***unit*** of Plato's «***arithmos monadikos***», denoted by **M**̊ in Diophantus' "syncopated" proto-algebraic notation, as found in the surviving ms. of his «*circa*» 250 C.E. treatise, known as the «***Arithmetiké***». The ***unit***, in that view, is ***qualitative***, *not quantitative*."'*Number*"', or "'*quantity*"', begins with two, *not* with one, per that view.

«***Aufheben***» Diagram: The '"Fractal"' 'Meta-«***Monad***»-ology' of the Indo-Arabic Numerals System

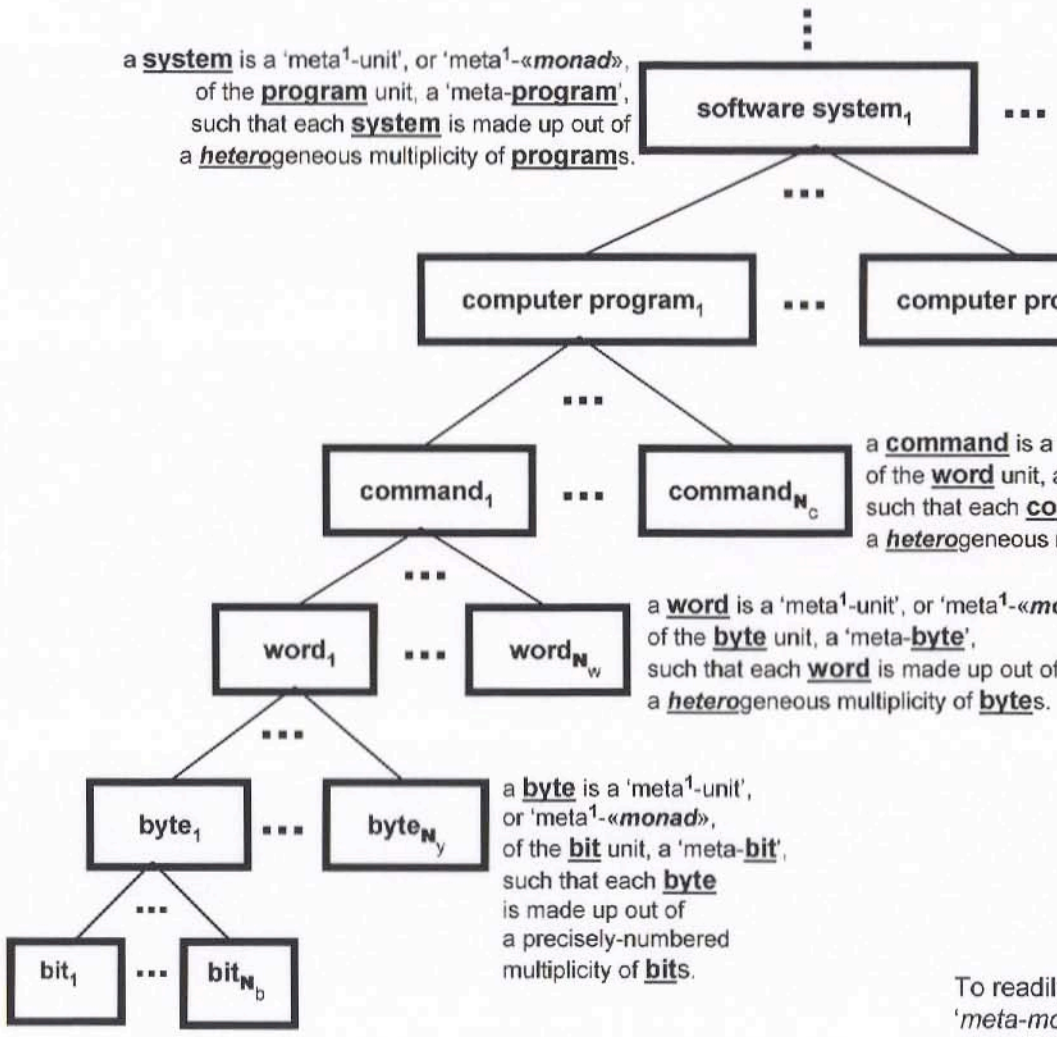


Synchronic «***Aufheben***» Diagram: The '***Meta-Fractal***' Structure of the 'Meta-Monadology' of Phonetic Writings-Systems



To readily instantiate this "'algebraically'"-general description of this '*meta-monadic*', '*meta-fractal*' structure, one might more easily work from the top down, rather than from the bottom up. Thus, one might designate a particular library as "Library$_1$", then designate a particular book within that library as "book$_1$", then designate, e.g., the first chapter of that book as "chapter$_1$", then, e.g., the first paragraph of that chapter as "paragraph$_1$", then the first sentence of that paragraph as "sentence$_1$", then the first word of that sentence as "word$_1$", and, finally, the first letter of that word as "letter$_1$".

Synchronic «***Aufheben***» Diagram: The '***Meta-Fractal***' Structure of the 'Meta-Monadology' of Modern 'Computerware'



To readily instantiate this '"algebraically"'-general description of this '*meta-monadic*', '*meta-fractal*' structure, one might more easily work from the top down, rather than from the bottom up. Thus, one might designate a particular software system as "system$_1$", then designate a particular program within that system as "program$_1$", then designate, e.g., the first command of that program as "command$_1$", then, e.g., the first word of that command as "word$_1$", then the first byte of that word as "byte$_1$", and, finally, the first bit of that byte as "bit$_1$".

Section III:

The Set Of All Sets --

Paradigm of *Dialectical* ‹‹*Autokinesis*››,

Model of '*Predico-Dynamasis*', and

‹‹*Reductio Ad Absurdum*›› *Self-Refutation*

of

'*Parmenidean*' *Set Theories*

"That too is unreasonable, replied Socrates. But, Parmenides, the best I can make of the matter is this – that these forms are as it were patterns fixed in the nature of things. The other things are made in their image and are likenesses, and this participation they come to have in the forms is nothing but their being made in their image.

Well, if a thing is made in the image of a form, can that form fail to be like the image of it, in so far as the image was made in its likeness? If a thing is like, must it not be like something that is like it?

It must.

And must not the thing which is like share with the thing that is like it in one and the same thing [character]?

Yes.

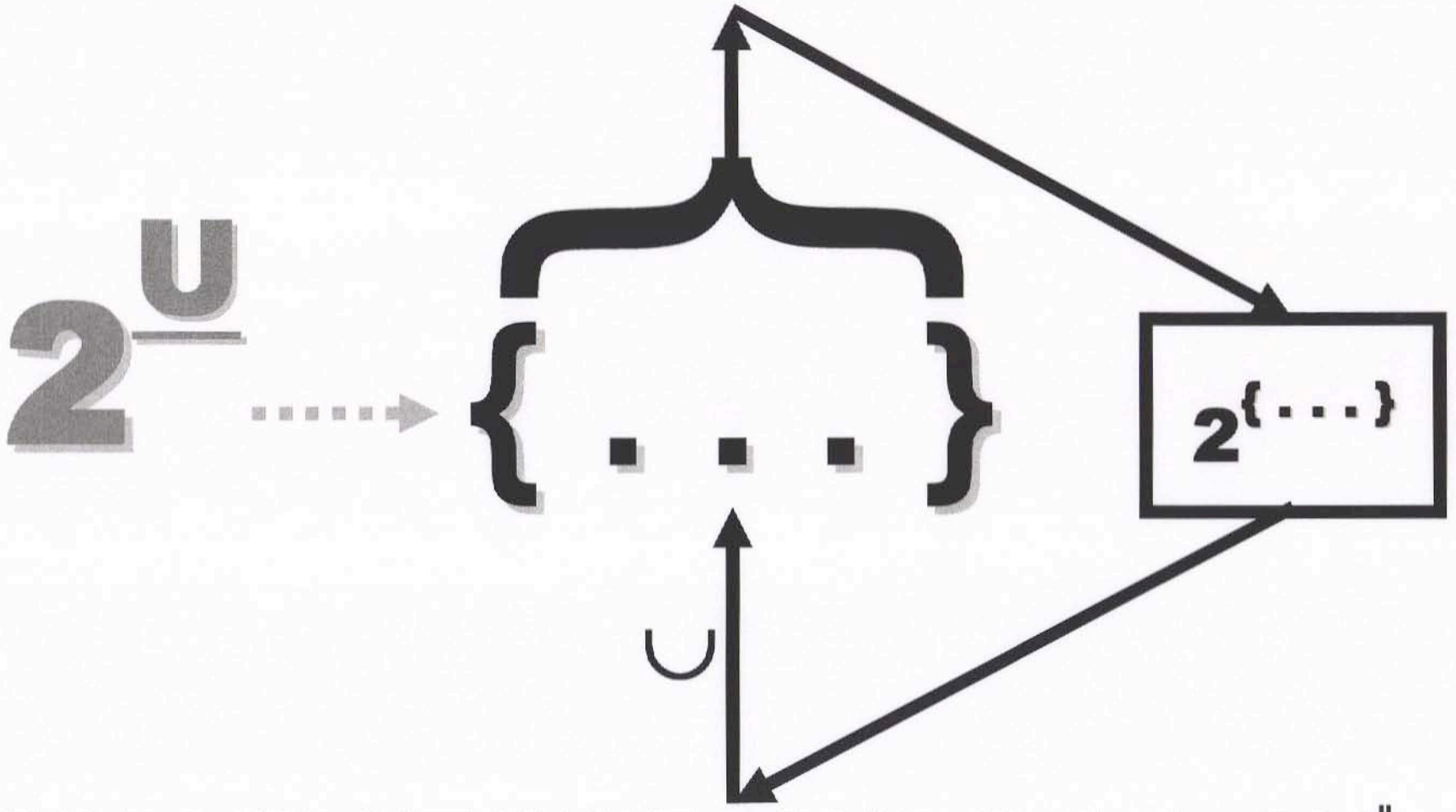
And will not that in which the like things share, so as to be alike, be just the form itself that you spoke of?

Certainly?

If so, nothing can be like the form, nor can the form be like anything. Otherwise a second form will always make its appearance over and above the first form, and if the second form is like anything, yet a third. And there will be no end to this emergence of fresh forms, if the form is to be like the thing that partakes of it."

Plato, ***Parmenides***, 132d – 133 [***emphasis*** added by F.E.D.]

The Finitary ***Set of All Sets***: 'Self-Process' / ‹‹***Auto-Kinesis***›› Depiction



Key:

U ≡ Finite [actually-constructed] **U**niversal Set, or set of all logical individuals, comprising the **U**niverse of Discourse in question; «***arché***»: $\underline{S}_0 \equiv 2^{\underline{U}}$.

$2^{\{\cdots\}}$ ≡ "Power-Set", or "Set of all Subsets", of the Set denoted by **{ . . . }**.

$\underline{S}_{\tau+1} \equiv \underline{S}_{\tau} \cup 2^{\underline{S}_{\tau}}$

The «***arché***» set-***unit*** here, the "Universal Set", denoted by $\underline{U}$, and also by $\underline{S}_0$, must Internalize itself plus all of its other -- "proper" -- subsets as well, to produce its next try at the "'***Set of All Sets***'", whose result, the set-unit $\underline{S}_1$, must then, in turn, also internalize itself and its other subsets to make its next try at the "'***Set of All Sets***'" ...

The mental "'***eventity***'", "'***self-movement***'", or ‹‹***autokinesis***›› that is the ***Set of All Sets*** may be modeled by a '***Seldon Function***', i.e.,

$S^{\tau}[\underline{S}_0] \equiv [\underline{S}_0]^{2^{\tau}}$, wherein $\underline{S}_k \times \underline{S}_k \equiv \underline{S}_k^{\,2} \equiv \underline{S}_k \cup 2^{\underline{S}_k} \equiv \underline{S}_{k+1}$.

$\underline{S}_6 = [\underline{S}_0]^{2^6} = [\underline{S}_5]^{64} = \underline{S}_5 \times \underline{S}_5 \equiv \underline{S}_5 \cup P[\underline{S}_5]$ → $\underline{S}_5$ ⇉ $P[\underline{S}_5]$

$\underline{S}_5 = [\underline{S}_0]^{2^5} = [\underline{S}_4]^{32} = \underline{S}_4 \times \underline{S}_4 \equiv \underline{S}_4 \cup P[\underline{S}_4]$ → $\underline{S}_4$ ⇉ $P[\underline{S}_4]$

$\underline{S}_4 = [\underline{S}_0]^{2^4} = [\underline{S}_3]^{16} = \underline{S}_3 \times \underline{S}_3 \equiv \underline{S}_3 \cup P[\underline{S}_3]$ → $\underline{S}_3$ ⇉ $P[\underline{S}_3]$

$\underline{S}_3 = [\underline{S}_0]^{2^3} = [\underline{S}_2]^{8} = \underline{S}_2 \times \underline{S}_2 \equiv \underline{S}_2 \cup P[\underline{S}_2]$ → $\underline{S}_2$ ⇉ $P[\underline{S}_2]$

$\underline{S}_2 = [\underline{S}_0]^{2^2} = [\underline{S}_1]^{4} = \underline{S}_1 \times \underline{S}_1 \equiv \underline{S}_1 \cup P[\underline{S}_1]$ → $\underline{S}_1$ ⇉ $P[\underline{S}_1]$

$\underline{S}_1 = [\underline{S}_0]^{2^1} = [\underline{S}_0]^{2} = \underline{S}_0 \times \underline{S}_0 \equiv \underline{S}_0 \cup P[\underline{S}_0]$ → $\underline{S}_0$ ⇉ $P[\underline{S}_0]$

$\underline{S}_0 = [\underline{S}_0]^{2^0} = [\underline{S}_0]^{1} = \underline{S}_0$ → $\underline{S}_0$

$\underline{S}_0$ ← A set of [***idea***-]objects / "elements" / "members" which ***are***, in general, ***sets***, or ***set***-[idea-]***objects***.

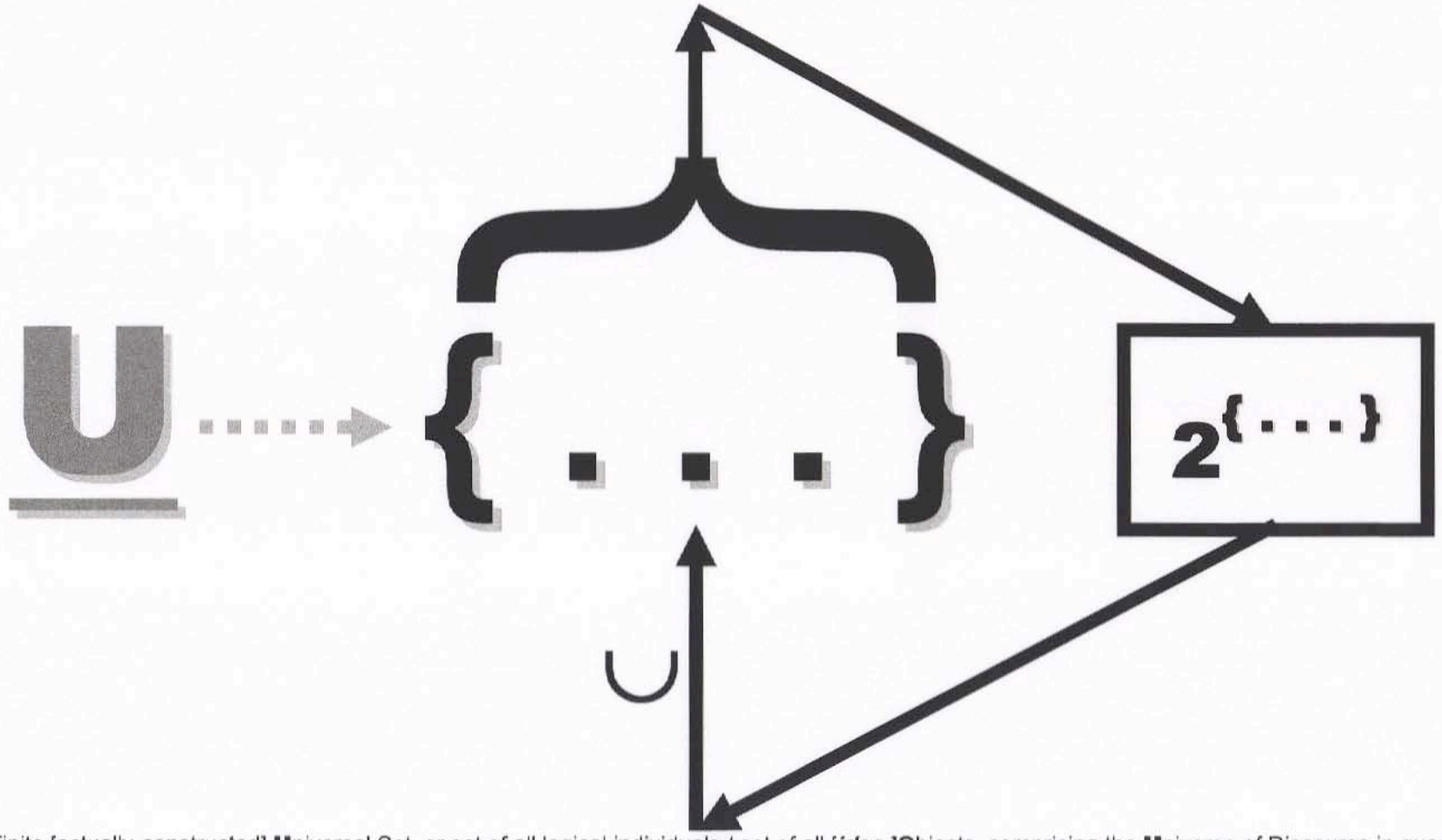
$2^{\underline{U}}$

«***arché***»: ***set of all subsets*** of $\underline{U}$, the "Universal Set", or the set of all objects/"logical individuals" of a given *Universe of Discourse, denoted by*: $2^{\underline{U}} \equiv \underline{S}_0 \equiv P[\underline{U}]$. → $\underline{U}$ ← A set of [***idea***-]objects / "elements" / "members", or of "logical individuals" which are ***not***, in general, ***sets***.

$P[\underline{S}_0]$ stands for the "Power Set", or set of all ***sub***sets, of the Set $\underline{S}_0$, often also expressed as $2^{\underline{S}_0}$.

«***Aufheben***» Diagram: The ***Dialectical*** 'Meta-Monadology' of the "'***Set of All Sets***'"

The Finitary ***Set of All Objects***: 'Self-Process' / ***Ideo-‹‹Auto-Kinesis››*** Depiction



Key:

U ≡ $\underline{O}_0$ ≡ Finite [actually-constructed] **U**niversal Set, or set of all logical individuals / set of all [***idea***-]**O**bjects, comprising the **U**niverse of Discourse in question.

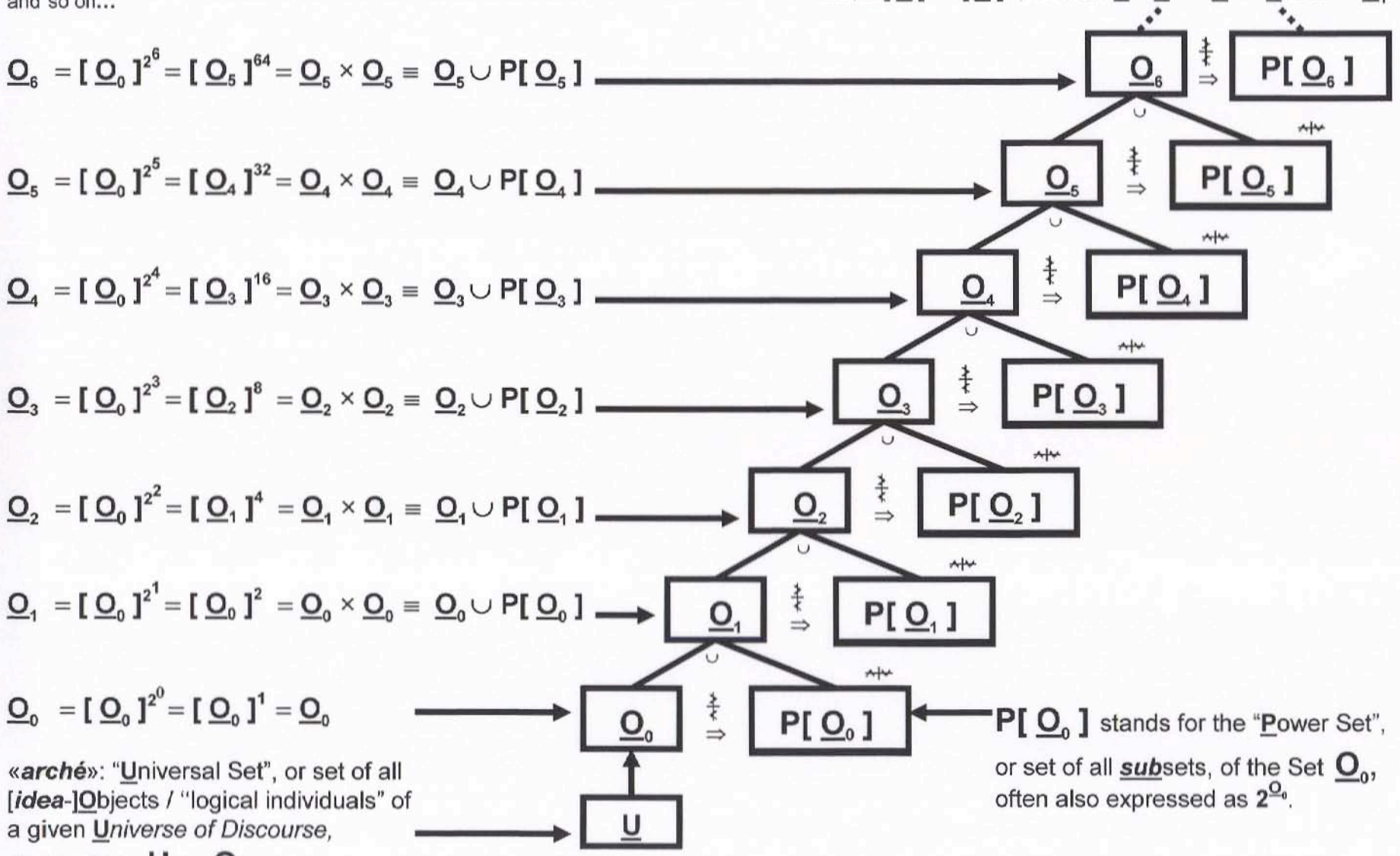
$2^{\{\cdots\}}$ ≡ "Power-Set", or "Set of all Subsets", of the Set denoted by **{ . . . }**.

$\underline{O}_{\tau+1} \equiv \underline{O}_\tau \cup 2^{\underline{O}_\tau}$

The «***arché***» set-***unit*** here, the "Universal Set", denoted by $\underline{U}$, and also by $\underline{O}_0$, must Internalize itself plus all of its other -- "proper" -- subsets as well, to produce its next try at the "'***Set of All Objects***"', whose result, the set-unit $\underline{O}_1$, must then, in turn, also internalize itself and its other subsets to make its next try at the "'***Set of All Objects***"', and so on...

The mental "'***eventity***"', "'***self-movement***"', or ‹‹***autokinesis***›› that is the ***Set of All Objects*** may be modeled by a '***Seldon Function***',

i.e., $S^{\tau}[\underline{U}] = [\underline{U}]^{2^{\tau}}$, wherein $\underline{U} \times \underline{U} = \underline{U}^2 = \underline{U} \cup 2^{\underline{U}} \equiv \underline{O}_1$.



«***arché***»: "Universal Set", or set of all [***idea***-]Objects / "logical individuals" of a given *Universe of Discourse*, *denoted by*: $\underline{U} \equiv \underline{O}_0$

$P[\underline{O}_0]$ stands for the "Power Set", or set of all ***sub***sets, of the Set $\underline{O}_0$, often also expressed as $2^{\underline{O}_0}$.

«***Aufheben***» Diagram: The ***Dialectical*** 'Meta-Monadology' of the "'***Set of All*** [*Idea*-]***Objects***"'

Section IV:

Some Dialectical Systematics of

The Dialectical Arithmetics

of

Dialectical Ideography

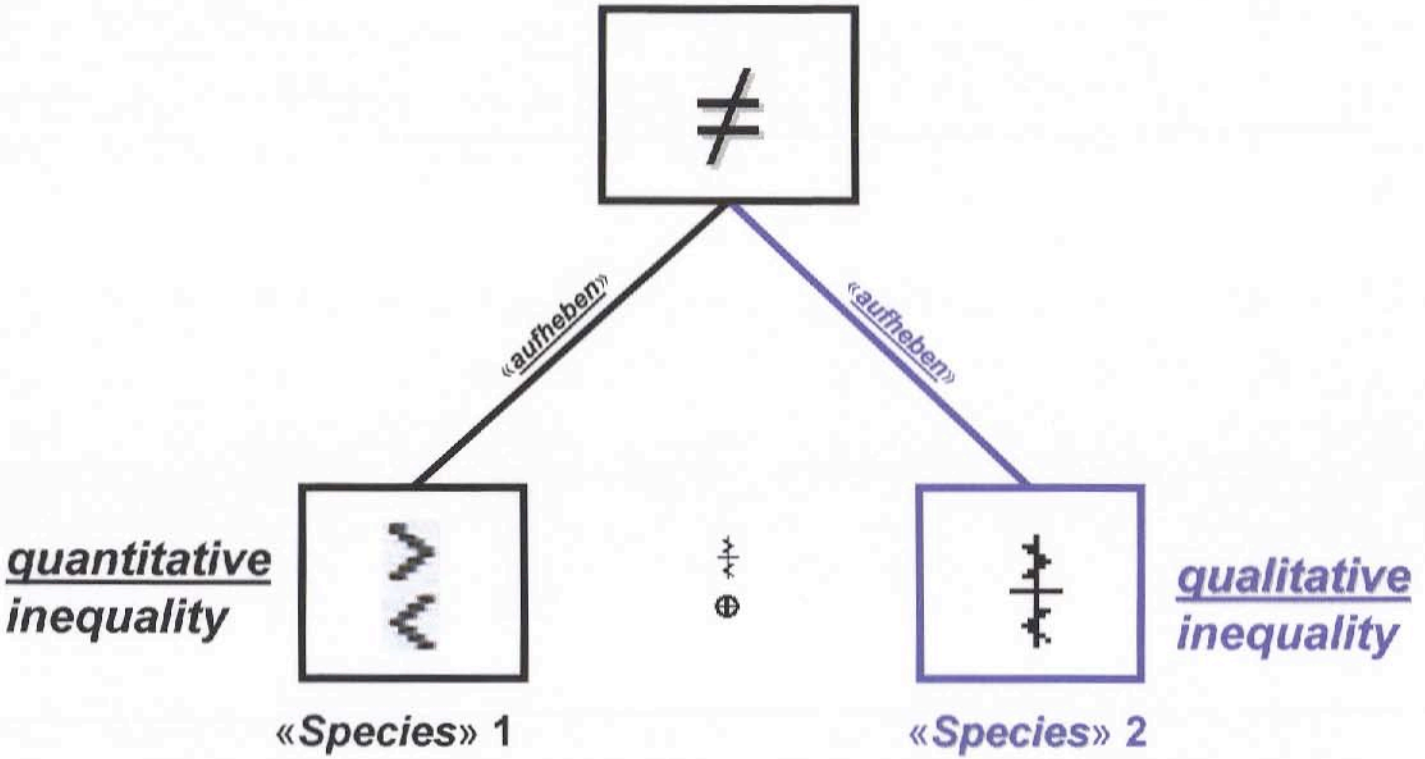
and

Encyclopedia Dialectica

'"Speciation"' of the «*Genos*» of the Mathematical *Inequality Relation*

«*Genos*»:

inequality in general



«***Aufheben***» Diagram: The Two «***Species***» of the «***Genos***» of Mathematical ***Inequality***

This relation, of '"qualitative inequality"', or of 'ontological inequality', is a key to the construction of a ***non-reductionistic***, '"***holistic notation***"', in the later, higher '"dialectical arithmetics"' [which are evoked in a '"systematic-dialectical"' arithmetical model, & method of presentation, of those arithmetics], via the 'syntactics' of their modeling of the dynamics & '***meta-dynamics***' of '***meta-super^{n}-systems***', miming the dialectical evolution ***&*** '***meta-evolution***' of such '***meta-super^{n}-systems***', via 'quanto-qualitative', 'dialectical-mathematical' formulae.

Paired Examples of the two «*Species*» of *Mathematical Inequality*

as they have Emerged Immanently in the [Cognitive Psycho-]History of Standard Mathematics

Standard Arithmetics	**Dimensional Analysis**	**Set Theory**	**Matrix Arithmetic**
$1 = 1$, and	1 ft. = 1 ft., and	$\{a, b\} = \{b, a\}$, and	$\begin{bmatrix}1 & 0\\0 & 1\end{bmatrix} = \begin{bmatrix}1 & 0\\0 & 1\end{bmatrix}$
			-- and, perhaps --
$1 < 2$, but	1 ft. < 2 ft., but	$\lvert\{a, b\}\rvert = \lvert\{b, a\}\rvert = 2$,	$\begin{bmatrix}1 & 0\\0 & 1\end{bmatrix} < \begin{bmatrix}2 & 0\\0 & 2\end{bmatrix} = 2\begin{bmatrix}1 & 0\\0 & 1\end{bmatrix}$
$1 \neq 1i$, where $i \equiv (-1)^{1/2}$	1 ft. ≠ 1 ft.^{2}, and	but $\{a, b\} \neq \{c, d\}$, if	
			-- but --
	1 ft. ≠ 1 lb.	$a \neq c, d$ & $b \neq c, d$	$\begin{bmatrix}1 & 0\\0 & 1\end{bmatrix} \neq \begin{bmatrix}0 & 1\\1 & 0\end{bmatrix}$
		-- even though, also --	
		$\lvert\{a, b\}\rvert = \lvert\{c, d\}\rvert = 2$.	

"Symbolic Logic" [Ideographic Formal Logic] -- "First Order Predicate Calculus

If '**.T.**' denotes the "truth-value" "True", if '**.F.**' denotes the "truth-value" "False", if 'Y^1' denotes the predicate "is yellow", if 'G^2' denotes the binary Relation of "gravitational attraction", implicit in the sentence-form "**x** gravitationally attracts **y**", if '**s**' denotes the "logical individual" named "sol" or "the sun", and if '**e**' denotes the "logical individual" named "the earth",

then perhaps $Y^1s = G^2se = G^2es = .T.$,

but definitely $Y^1 \neq G^2$, and $Y^1 \neq s$, and $Y^1 \neq e$, and $G^2 \neq s$, and $G^2 \neq e$, and $s \neq e$.

Peano-Postulates-Compliance of the *System* of the "**N**atural" Numbers, **N**, and of their first '*Contra-System*', for the **N**-Based *Space* of the $_{\mathbf{N}}\underline{\mathbf{Q}}$ 'Meta-Natural Numbers' of *Dialectical Ideography*

N: First Order Peano Postulates: [mainly] "'Phonogramic"' Rendering	[mainly] "'Ideogramic"' Rendering
1 is a "**N**atural" Number.	$1 \in \mathbf{N}$
The ***successor*** of a "**N**atural" Number is also a "**N**atural" Number.	$n \in \mathbf{N} \Rightarrow s(n) \in \mathbf{N}$
No two "**N**atural" Numbers have the same ***successor***.	$n, m \in \mathbf{N} \,\&\, n \neq m \Rightarrow s(n) \neq s(m)$
1 is not the ***successor*** of any "**N**atural" Number.	$\neg\exists x \in \mathbf{N} \mid s(x) = 1$

"***Successor*** function" for the **N**: $s(n) = n + 1$

"***Successor*** function" for the $_{\mathbf{N}}\underline{\mathbf{Q}}$: $\underline{s}[\underline{q}_n] = \underline{q}_{s(n)} = \underline{q}_{n+1}$

$_{\mathbf{N}}\underline{\mathbf{Q}}$: First Order Peano Postulates: [mainly] "'Phonogramic"' Rendering	[mainly] "'Ideogramic"' Rendering
$\underline{q}_1$ is a 'Meta-**N**atural Meta-Number'.	$\underline{q}_1 \in {}_{\mathbf{N}}\underline{\mathbf{Q}}$
The ***successor*** of a 'Meta-Number' is also a 'Meta-Number'.	$\underline{q}_n \in {}_{\mathbf{N}}\underline{\mathbf{Q}} \Rightarrow \underline{s}[\underline{q}_n] \in {}_{\mathbf{N}}\underline{\mathbf{Q}}$, given $n \in \mathbf{N}$
No two 'Meta-Numbers' have the same ***successor***.	$\underline{q}_n, \underline{q}_m \in {}_{\mathbf{N}}\underline{\mathbf{Q}} \,\&\, \underline{q}_n \neq \underline{q}_m \Rightarrow \underline{s}[\underline{q}_n] \neq \underline{s}[\underline{q}_m]$, given $n, m \in \mathbf{N}$
$\underline{q}_1$ is not the ***successor*** of any 'Meta-**N**atural Meta-Number'.	$\neg\exists \underline{q}_x \in {}_{\mathbf{N}}\underline{\mathbf{Q}} \mid \underline{s}[\underline{q}_x] = \underline{q}_1$, given $x \in \mathbf{N}$

Generalization of the Four Basic Operations of $\underline{\mathbb{N}}$ Arithmetic for the *Dialectical Arithmetics*: The Case of *Addition*

'*Dynamical* «*Arithmos Eidetikos*», and '*Dynamical* Disjunctive Syllogism'

«*Genos*»:

ADDITION

«*species*»:

$\underline{\mathbb{N}}$ Addition

Amalgamative, e.g.:

$2 + 3 = 5$

«*Genos*»:

ADDITION-in-«*Gen*»-eral

«aufheben» «una» «aufheben»

«*species*»$_1$:

Purely-*Quantitative* Addition

Amalgamative, e.g.:

$2 + 3 = 5$

«*species*»$_2$:

Purely-*Qualitative* Addition

Non-Amalgamative for Unlikes, e.g.:

$\underline{q}_2 \boxplus \underline{q}_3 \neq \underline{q}_n$

$\forall \underline{q}_n \in {}_{\mathbb{N}}\underline{Q}$

Super-Amalgamative for Likes, e.g.:

$\underline{q}_n \boxplus \underline{q}_n = \underline{q}_n$

$\forall \underline{q}_n \in {}_{\mathbb{N}}\underline{Q}$

["Additive Idempotency"]

«*species*»$_3$:

Quanto-Qualitative Addition

Non-Amalgamative for Unlikes, e.g.:

$\hat{\underline{u}}_2 \boxplus \hat{\underline{u}}_3 \neq \hat{\underline{u}}_n$

$\forall \hat{\underline{u}}_n \in {}_{\mathbb{N}}\underline{U}$

Amalgamative for Likes, e.g.:

$\hat{\underline{u}}_n \boxplus \hat{\underline{u}}_n = 2\hat{\underline{u}}_n$

$\forall \hat{\underline{u}}_n \in {}_{\mathbb{N}}\underline{U}$

["Additivity"]

Generalization of the Four Basic Operations of $\mathbb{N}$ Arithmetic for the *Dialectical Arithmetics*: The Case of *Multiplication*

'*Dynamical* «*Arithmos Eidetikos*», and '*Dynamical* Disjunctive Syllogism'

«*Genos*»:

MULTIPLICATION

«*species*»:

$\mathbb{N}$ Multiplication

Amalgamative, e.g.:

$2 \times 3 = 6$

«*Genos*»:

MULTIPLICATION-in-«*Gen*»-eral

«*aufheben*» «*auf*» «*aufheben*»

«*species*»$_1$:

Purely-*Quantitative* Multiplication

«*species*»$_2$:

Purely-*Qualitative* Multiplication

«*species*»$_3$:

Quanto-*Qualitative* Multiplication

$\ddagger$ $\oplus$ $\ddagger$ $\oplus$

Amalgamative, e.g.:

$2 \times 3 = 6$

Non-Amalgamative for *Likes* & *Unlikes alike*, e.g.:

$\underline{q}_n \boxtimes \underline{q}_m = \underline{q}_m \boxplus \underline{q}_{m+n}$

per '«*aufheben*» evolute product rule'

Amalgamative for *Likes* & *Unlikes*, e.g.:

$2\hat{\underline{u}}_n \boxtimes 3\hat{\underline{u}}_m = 6\hat{\underline{u}}_{m+n}$

per '*meta-heterosis* convolute product rule'

Amalgamative for *Dual*, *Additive/Multiplicative Identity Element*, e.g.:

$\underline{q}_0 \boxtimes \underline{q}_w = \underline{q}_w \boxplus \underline{q}_{0+w} = \underline{q}_w$

$\forall \underline{q}_w \in {}_w\underline{Q}$

["Multiplicative Identity"]

Amalgamative for *Dual Identity Element*, e.g.:

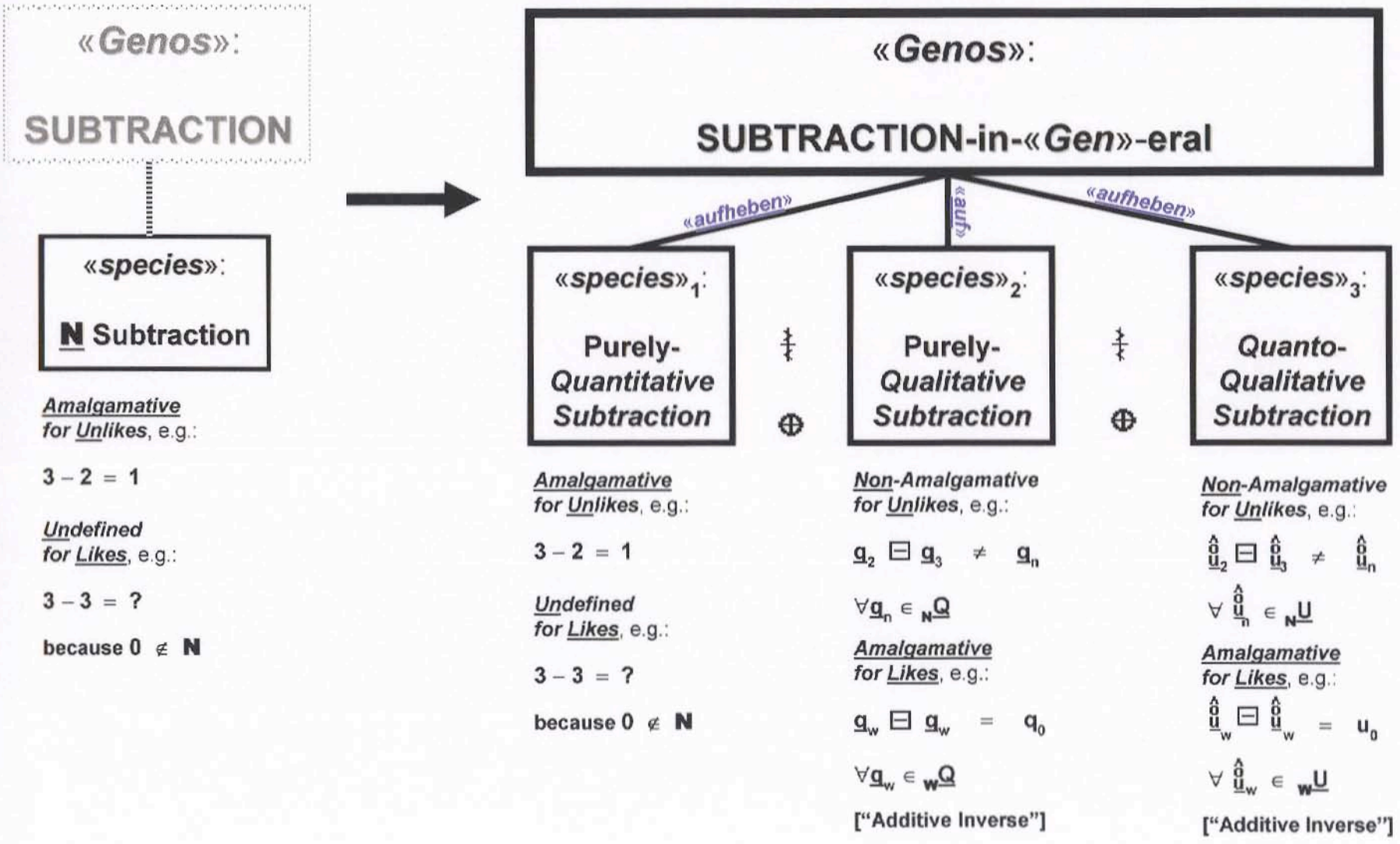
$u_0 \boxtimes \hat{\underline{u}}_w = \hat{\underline{u}}_{w+0} = \hat{\underline{u}}_w$

$\forall \hat{\underline{u}}_w \in {}_w\underline{U}$

["Multiplicative Identity"]

Generalization of the Four Basic Operations of **N** Arithmetic for the *Dialectical Arithmetics*: The Case of *Subtraction*

'*Dynamical* «*Arithmos Eidetikos*», and '*Dynamical* Disjunctive Syllogism'



'«*Genos*»-eralization' of the Four Basic Operations of '"Standard Rational"', or $\underline{\mathbf{Q}}$, Arithmetic for the *Dialectical Arithmetics*: The Case of *Division*

'*Dynamical* «*Arithmos Eidetikos*», and '*Dynamical* Disjunctive Syllogism'

«*Genos*»:

DIVISION

«*species*»:

$\underline{\mathbf{Q}}$ Division

Amalgamative, e.g.:

$2 \div 3 = 2/3$

Undefined for Division by Additive Identity Element, e.g.:

$2 \div 0 = ?$

«*Genos*»:

DIVISION-in-«*Gen*»-eral

«aufheben» «auf» «aufheben»

«*species*»$_1$:

Purely-*Quantitative* Division

«*species*»$_2$:

Purely-*Qualitative* Division

«*species*»$_3$:

Quanto-Qualitative Division

Amalgamative, e.g.:

$2 \div 3 = 2/3$

Undefined for Division by Additive Identity Element, e.g.:

$2 \div 0 = ?$

Non-Amalgamative, typically, for Likes & Unlikes alike, e.g.:

$\underline{q}_n \boxdiv \underline{q}_m = \underline{q}_{n-m} \boxtimes \underline{q}_{n-m}$

$\forall \underline{q}_n, \underline{q}_m \in {}_{\mathbf{z}}\underline{\mathbf{Q}}$

per '«*aufheben*» evolute product rule'

Amalgamative for Additive Identity Element Division, e.g., per '«*aufheben*» evolute product rule":

$\underline{q}_z \boxdiv q_0 = q_{-0} \boxtimes \underline{q}_{z-0} = \underline{q}_z$

$\forall \underline{q}_z \in {}_{\mathbf{z}}\underline{\mathbf{Q}}$

[q_0 is '*Dual* Identity Element']

Amalgamative for Likes & Unlikes, e.g.:

$2\hat{\underline{u}}_n \boxdiv 3\hat{\underline{u}}_m = +2/3\hat{\underline{u}}_{n-m}$

$\forall \underline{q}_n, \underline{q}_m \in {}_{\mathbf{z}}\underline{\mathbf{Q}}$

per '*meta-heterosis* product rule'

Amalgamative for Division by Additive Identity Element, e.g.:

$\hat{\underline{u}}_w \boxdiv u_0 = \hat{\underline{u}}_{w-0} = \hat{\underline{u}}_w$

$\forall \hat{\underline{u}}_w \in {}_{\mathbf{w}}\underline{\mathbf{U}}$

[Additive Identity *Division* is well-defined; u_0 is *Dual*]

Note: $\underline{\mathbf{Q}} \ddagger {}_{\mathbf{z}}\underline{\mathbf{Q}}$.

Proof of the *Seldon Function Equation* for $_{N}\underline{\underline{Q}}$

Theorem: *The Seldon Function Equation* ***Theorem*** of $_{N}\underline{\underline{Q}}$

as in the $_{N}\underline{\underline{Q}}$ Model of ***The Dialectic of the Dialectical Arithmetics***, Including of the second, $_{N}\underline{\underline{Q}}$ dialectical arithmetic, as modeled by

$$\langle \underline{\underline{N}} \rangle^{2^{\tau}} \longmapsto [\![\underline{q}_1]\!]^{2^{\tau}} -$$

$$_{N}\underline{\underline{Q}} \vdash [\![\underline{q}_1]\!]^{2^{\tau}} = [\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^{\tau}}]\!]$$

PREMISES of the Axioms-System denoted by $_{N}\underline{\underline{Q}}$, relevant for this Proof --

(1) [Axiom]: Rule of **Additive Idempotency** -- $\underline{q}_n \boxplus \underline{q}_n = \underline{q}_n, \forall n \in \mathbf{N}$

(2) [Rule of Inference]: **Finite Induction** Rule

(3) [Definition]: $_{N}\underline{\underline{Q}}$ Multiplication, «***Aufheben***» **Evolute Product** Rule, preserving *consecutivity*, $n \in \mathbf{N}$ --

$$[\![\underline{q}_1 \boxplus \underline{q}_n]\!] \boxtimes [\![\underline{q}_1 \boxplus \underline{q}_n]\!] = [\![\underline{q}_1 \boxplus \underline{q}_n]\!] \boxplus \underline{q}_n \boxtimes [\![\underline{q}_1 \boxplus \underline{q}_n]\!] = [\![\underline{q}_1 \boxplus \underline{q}_n \boxplus \underline{q}_{n+1} \boxplus \underline{q}_{n+n}]\!]$$

(4) [Axioms]: Rules of the **Equality Relation**

(5) [Theorems]: **R Addition**, **Multiplication**, & **Exponentiation Operations**, & their Generalizations for $_{N}\underline{\underline{Q}}$

(6) [Definition]: Seldon Equation, Right-Hand Side, is a ***consecutive*** sum of $\underline{q}_i$, from $\underline{q}_1$ to $\underline{q}_{2^{\tau}}$ [**SE-RHS**] —

(7) [Syntax Rules]: ***Parentheses*** "'***Gram***-mar"' Rules

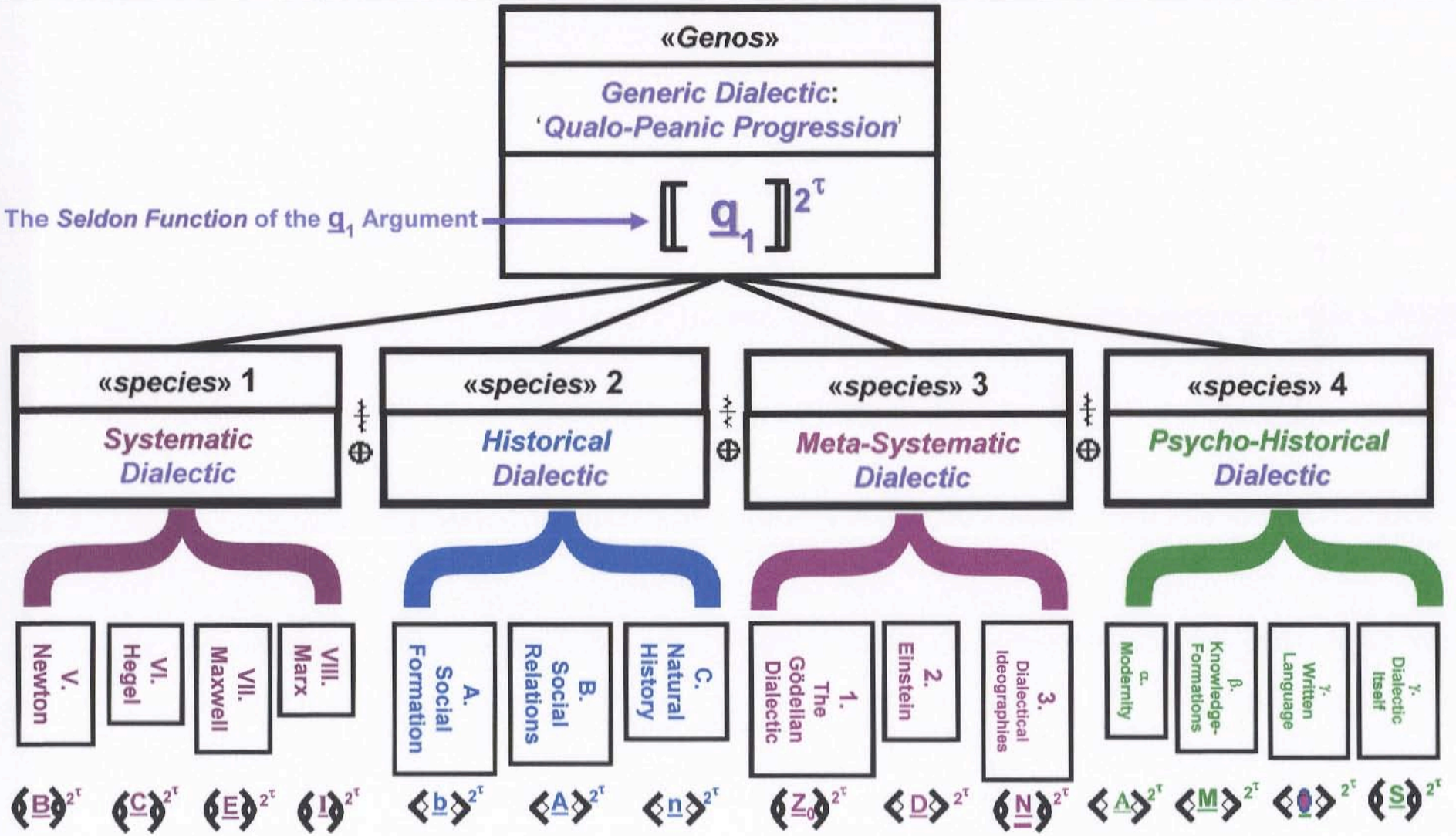
Proof of the *Seldon Function Equation* for ${}_{N}\underline{Q}$ [continued]

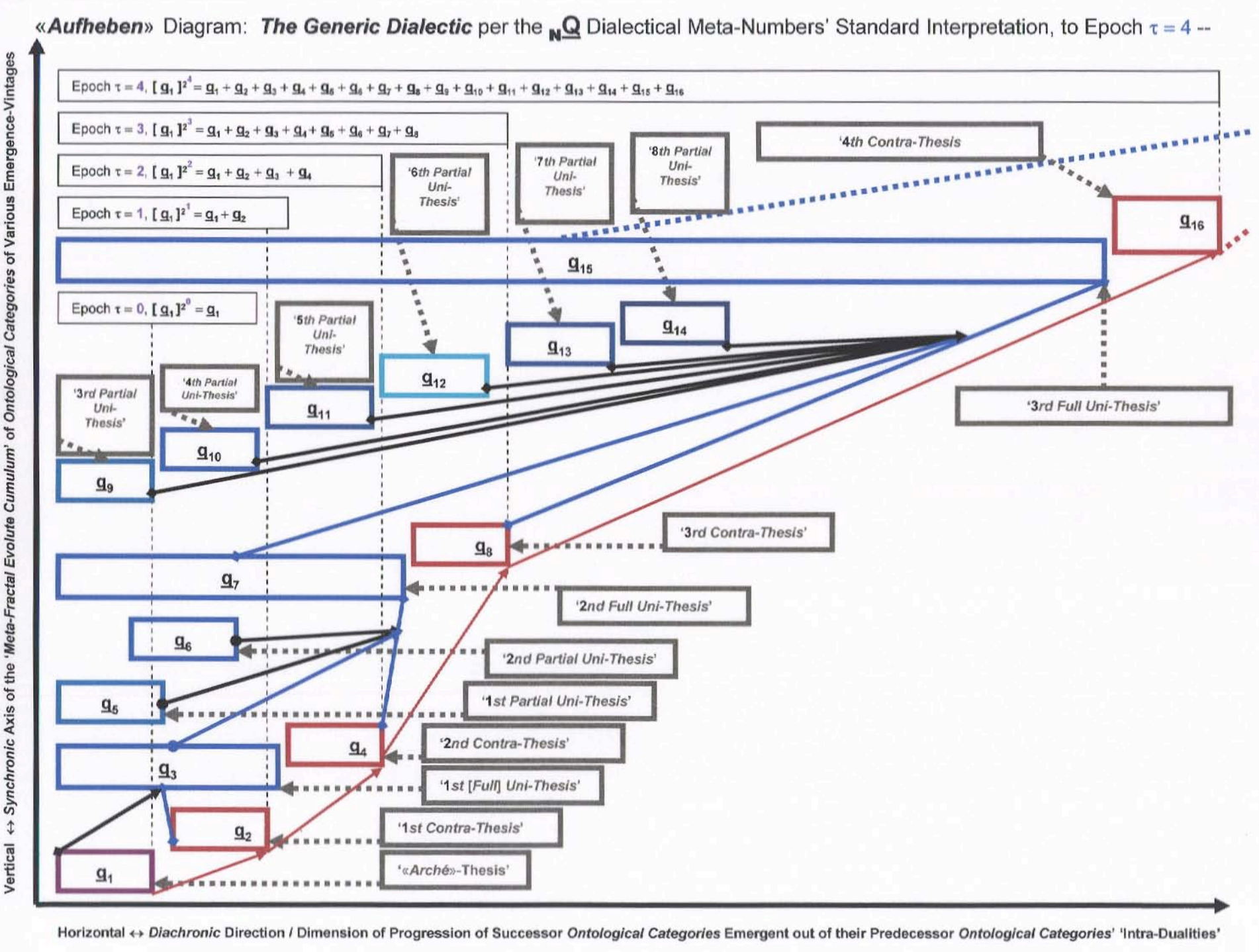
Step #	Proposition / Step to be Justified	Prop. / Step Strategy / Justification
1.	$\vdash [\![\underline{q}_1]\!]^{2^0} = [\![\underline{q}_1]\!]^1$	Establish *Base Clause* for Proof by Finite Induction: Theorems of the Exponentiation Operation -- meaning, zeroth power for **R**eals.
2.	$[\![\underline{q}_1]\!]^1 = [\![\underline{q}_1]\!] = \underline{q}_1$	Theorems of the Exponentiation Operation -- meaning of the 1st power for 'Meta-Natural Meta-Numbers'; Parentheses Removal Rule.
3.	$[\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^0}]\!] = [\![\underline{q}_1 \boxplus \underline{q}_1]\!]$	Theorems of the Exponentiation Operation -- meaning of the zeroth power for **R**eal Numbers; consecutivity meaning of SE-RHS.
4.	$[\![\underline{q}_1 \boxplus \underline{q}_1]\!] = [\![\underline{q}_1]\!] = \underline{q}_1$	Axiom: Additive Idempotency; Parentheses Removal Rule.
5.	$[\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^0}]\!] = [\![\underline{q}_1]\!]^{2^0} = \underline{q}_1$	Axiom: Transitive Law of Equality for ${}_{N}\underline{Q}$ 'Meta-Numbers', applied to Steps 1-2 & 3-4.
6.	$[\![\underline{q}_1]\!]^{2^0} = [\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^0}]\!] = \underline{q}_1$	Axiom: Symmetric Law of Equality for ${}_{N}\underline{Q}$ 'Meta-Numbers', applied to Step 5; *Base Clause* for Finite Induction established.
7.	Assume $[\![\underline{q}_1]\!]^{2^\tau} = [\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^\tau}]\!]$	Establish *Recursion Clause* for Proof by Finite Induction: Assume $\underline{P}(\tau)$; then prove that *IF* $\underline{P}(\tau)$, *THEN* $\underline{P}(\tau+1)$, i.e., $\underline{P}(\tau) \Rightarrow \underline{P}(\tau+1)$.
8.	$[\![\underline{q}_1]\!]^{2^{\tau+1}} = [\![\underline{q}_1]\!]^{2^\tau \times 2^1}$	Theorems of the Exponentiation Operation -- equivalence of addition of powers and multiplication of bases.
9.	$[\![\underline{q}_1]\!]^{2^\tau \times 2^1} = [\![[\![\underline{q}_1]\!]^{2^\tau}]\!]^{2^1} = [\![[\![\underline{q}_1]\!]^{2^\tau}]\!]^2$	Theorems of the Exponentiation Operation -- multiplication of powers; meaning of the 1st power for **R**eal Numbers.
10.	$[\![[\![\underline{q}_1]\!]^{2^\tau}]\!]^2 = [\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^\tau}]\!]^2$	Finite Induction *Recursion Clause* Assumption of Step 7. applied.
11.	$= [\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^\tau}]\!] \boxtimes [\![\underline{q}_1 \boxplus \ldots \boxplus \underline{q}_{2^\tau}]\!]$	Theorems of the Exponentiation Operation -- meaning of the 2nd power ["squaring"].

Proof of the *Seldon Function Equation* for ${}_{N}\underline{Q}$ [continued & concluded]

Step #	Proposition / Step to be Justified	Prop. / Step Strategy / Justification
12.	$= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau}]\!] \boxtimes [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau}]\!] =$ $= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau}]\!] \boxplus q_{2^\tau} \boxtimes [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau}]\!] =$	by Definition of $\boxtimes$ '«*aufheben*» evolute product rule'
13.	$[\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau}]\!] \boxplus$ $[\![q_1 \boxplus q_{2^\tau+1} \boxplus \rightsquigarrow \boxplus q_{2^\tau} \boxplus q_{2^\tau+2^\tau}]\!] =$	by Definition of $\boxtimes$ '«*aufheben*» evolute product rule'
14.	$[\![q_1 \boxplus q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau} \boxplus q_{2^\tau} \boxplus q_{2^\tau+1} \boxplus \rightsquigarrow \boxplus q_{2^\tau+2^\tau}]\!]$ $= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau} \boxplus q_{2^\tau+1} \boxplus \rightsquigarrow \boxplus q_{2^\tau+2^\tau}]\!]$	Axiom: Additive Idempotency or Idempotent Addition; 'Parenthesis Grammar' Rules.
15.	$= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau} \boxplus q_{2^\tau+1} \boxplus \rightsquigarrow \boxplus q_{2 \times 2^\tau}]\!]$	Theorems of the Addition & Multiplication Operations for "Real" values -- doubling is multiplicative equivalent of 'self-addition'.
16.	$= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau} \boxplus q_{2^\tau+1} \boxplus \rightsquigarrow \boxplus q_{2^1 \times 2^\tau}]\!]$	Theorems of the Exponentiation Operation -- meaning of the first power for "Real" Numbers.
17.	$= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau} \boxplus q_{2^\tau+1} \boxplus \rightsquigarrow \boxplus q_{2^{1+\tau}}]\!]$	Theorems of the Exponentiation Operation -- addition of powers equivalent for multiplied bases.
18.	$= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau} \boxplus q_{2^\tau+1} \boxplus \rightsquigarrow \boxplus q_{2^{\tau+1}}]\!]$	Theorems of the Addition Operation for "Real" values -- additive commutativity at the exponent level.
19.	$= [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^{\tau+1}}]\!]$	consecutivity -- meaning of SE-RHS and of $\rightsquigarrow$
20.	$[\![q_1]\!]^{2^{\tau+1}} = [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^{\tau+1}}]\!]$	Transitive Law of Equality for ${}_{N}\underline{Q}$ 'Meta-Numbers', applied to Steps 8. - 19.: Finite Induction *Recursion Clause* Established.
21.	$[\![q_1]\!]^{2^\tau} = [\![q_1 \boxplus \rightsquigarrow \boxplus q_{2^\tau}]\!]$	By Finite Induction *Base Clause* & *Recursion Clause*: ∎ [[P(0)] & [*IF* P(τ), *THEN* P(τ+1)]] ⇒ P(τ). QED.

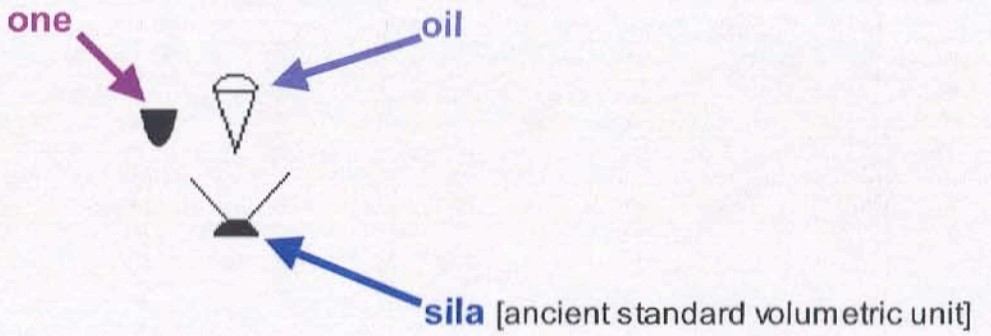
The Central Proposition of *Dialectical Ideography* and of *Encyclopedia Dialectica* Regarding the Dialectic-Modeling Utility of the $_{N}\underline{\underline{Q}}$ *Dialectical Arithmetic*




«Aufheben» Diagram: The Generic Dialectic per the $_{N}\underline{Q}$ Dialectical Meta-Numbers' Standard Interpretation, to Epoch τ = 4 --
Epoch τ = 4, $[\underline{q}_1]^{2^4} = \underline{q}_1 + \underline{q}_2 + \underline{q}_3 + \underline{q}_4 + \underline{q}_5 + \underline{q}_6 + \underline{q}_7 + \underline{q}_8 + \underline{q}_9 + \underline{q}_{10} + \underline{q}_{11} + \underline{q}_{12} + \underline{q}_{13} + \underline{q}_{14} + \underline{q}_{15} + \underline{q}_{16}$
Epoch τ = 3, $[\underline{q}_1]^{2^3} = \underline{q}_1 + \underline{q}_2 + \underline{q}_3 + \underline{q}_4 + \underline{q}_5 + \underline{q}_6 + \underline{q}_7 + \underline{q}_8$
Epoch τ = 2, $[\underline{q}_1]^{2^2} = \underline{q}_1 + \underline{q}_2 + \underline{q}_3 + \underline{q}_4$
Epoch τ = 1, $[\underline{q}_1]^{2^1} = \underline{q}_1 + \underline{q}_2$
Epoch τ = 0, $[\underline{q}_1]^{2^0} = \underline{q}_1$
'6th Partial Uni-Thesis'
'7th Partial Uni-Thesis'
'8th Partial Uni-Thesis'
'4th Contra-Thesis
$\underline{q}_{16}$
$\underline{q}_{15}$
'5th Partial Uni-Thesis'
$\underline{q}_{14}$
$\underline{q}_{13}$
$\underline{q}_{12}$
'4th Partial Uni-Thesis'
'3rd Partial Uni-Thesis'
$\underline{q}_{11}$
'3rd Full Uni-Thesis'
$\underline{q}_{10}$
$\underline{q}_9$
'3rd Contra-Thesis'
$\underline{q}_8$
$\underline{q}_7$
'2nd Full Uni-Thesis'
$\underline{q}_6$
'2nd Partial Uni-Thesis'
$\underline{q}_5$
'1st Partial Uni-Thesis'
'2nd Contra-Thesis'
$\underline{q}_4$
$\underline{q}_3$
'1st [Full] Uni-Thesis'
'1st Contra-Thesis'
$\underline{q}_2$
'«Arché»-Thesis'
$\underline{q}_1$
Vertical ↔ Synchronic Axis of the 'Meta-Fractal Evolute Cumulum' of Ontological Categories of Various Emergence-Vintages
Horizontal ↔ Diachronic Direction / Dimension of Progression of Successor Ontological Categories Emergent out of their Predecessor Ontological Categories' 'Intra-Dualities'

"'*Quantifiers*'", '*Ontological Qualifiers*', and '*Metrical Qualifiers*'

Ancient Mesopotamia,
Horizon Uruk III, circa 3000 B.C.E.,
proto-picto-ideographic* symbology:

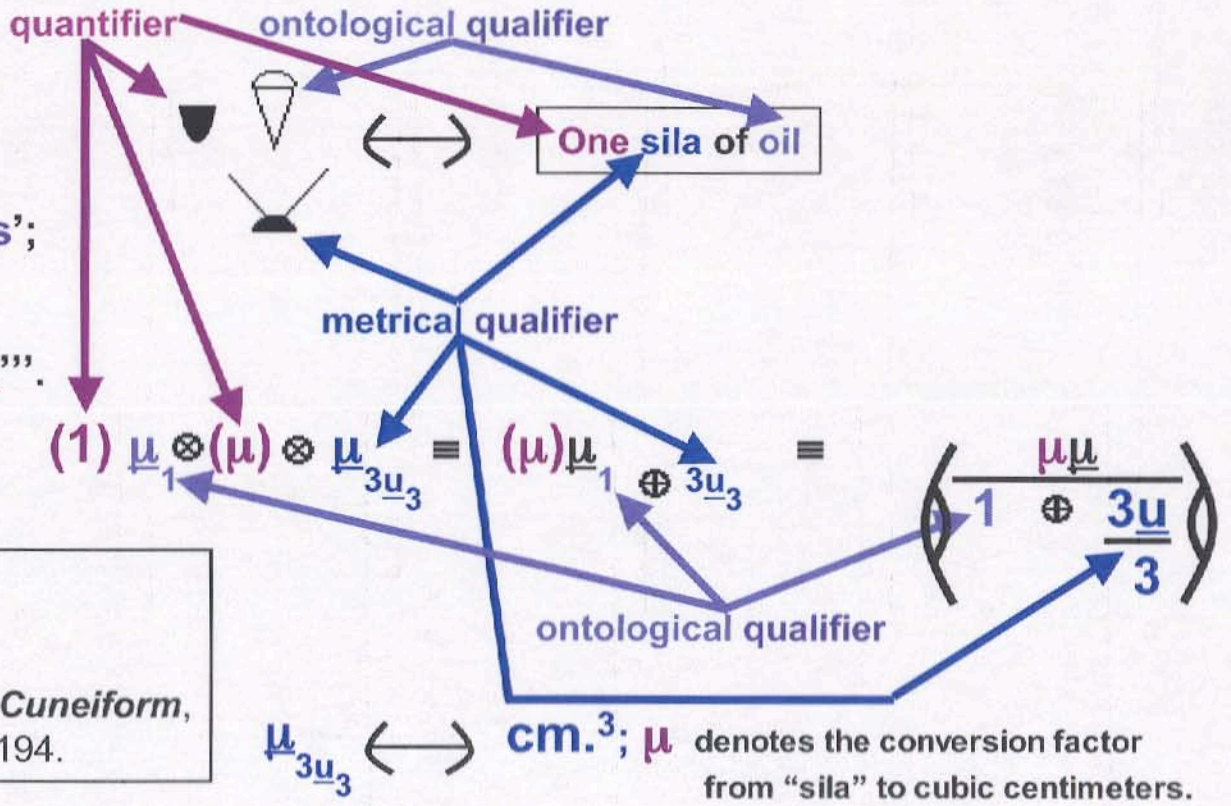


Translation per Modern English:

oil ∈ '*ontological* qualifiers';

cm.^{3} ∈ '*metrical* qualifiers';

one ∈ "'metrical *quantifiers*"'.

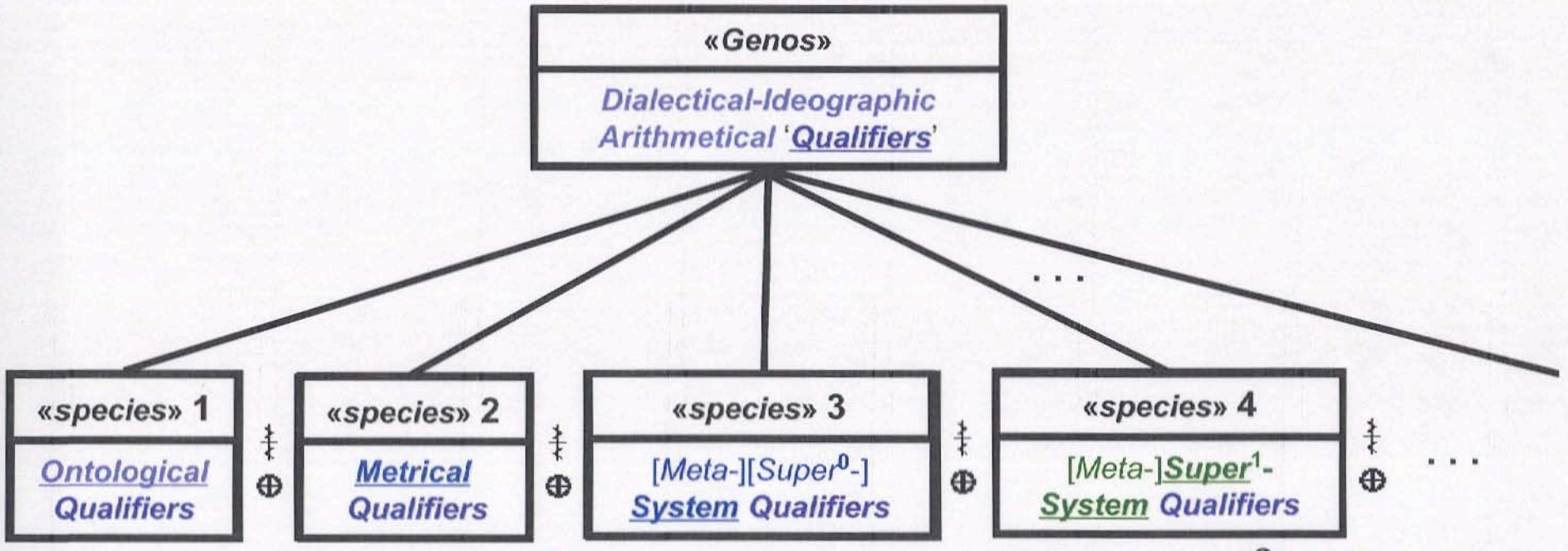


Translation per *Dialectical Ideography*:

*based upon:

Denise Schmandt-Besserat,
Before Writing*: *From Counting to Cuneiform,
U. of Texas Press [Austin: 1992], p. 194.

«*Arithmos Eidetikos*», or *Dialectical*, *Systematics* of the '*Ideogramic Qualifiers*', or '*Meta-Numbers*', of the *Dialectical Ideographies*



e.g., $\underline{\underline{q}} \equiv \underline{q}_1$

e.g., $\underline{\underline{\mu}}_{\sum_{j=1,M} \underline{u}_j \underline{u}_j}$,

viz., $\underline{\underline{\mu}}_{3\underline{u}_3}$, for

cubic cms.

e.g.,

$$\left\langle \frac{\underline{\alpha}}{\underline{\underline{\sum}}_{k=1,N} \underline{\underline{\mu}}_k(t) \underline{\underline{\mu}}_k \oplus \underline{\underline{\sum}}_{j=1,M_k} \underline{u}_j \otimes {}_k\underline{u}_j} \right\rangle,$$

Describing the State[[/Control] Meta-]Space [Self-]Movement of a [Meta-]Dynamical System, with no Sub-System detail.

e.g.,

$$\left\langle \begin{array}{c} \underline{\beta} \\ \hline \underline{\underline{\sum}}_{k=1,N} \underline{\underline{\mu}}_k(t) \otimes \underline{\underline{\mu}}_k \oplus \underline{\underline{\sum}}_{j=1,M_k} \underline{u}_{jk} \otimes \underline{u}_{jk} \\ \hline \underline{\underline{\sum}}_{L=1,\Omega} \underline{\alpha}_L \\ \hline \underline{\underline{\sum}}_{k=1,N_L} {}_L\underline{\underline{\mu}}_k(t) \otimes {}_L\underline{\underline{\mu}}_k \oplus \underline{\underline{\sum}}_{j=1,M_k} \underline{u}_j \otimes {}_{L,k}\underline{u}_j \end{array} \right\rangle,$$

Describing a [Meta-]Dynamical Super[1]-System, with System detail, or a System with Sub[1]-System detail.

Algorithmic-Ideographical
Dimensional Analysis --

The '***Metrical Qualifier Meta-Numbers***' of the $\underline{\mathbf{q}}_7 \hookleftarrow \underline{\underline{\mathbf{q}}}_{MU} \equiv \underline{\underline{\mu}}$ Arithmetic

The $\underline{\underline{\mu}}$ arithmetic can model, in no-longer-"syncopated", but fully-"symbolic" or 'ideographical' and 'algorithmical' fashion, the basic rules of the *arithmetic of dimensional analysis*, as expressed in the first four theorems of Chapter **5**, on the "***Arithmetic of Dimensions***", pp. **95-96** in the **1998** treatise ***Applied Dimensional Analysis and Modeling***, by T. Szirtes.

Background. Per the standard notation of dimensional analysis, the "'square-bracket'" parentheses, **[...]**, denotes an operator which extracts the "dimension", "'dimensional ***unit***'", or 'dimensional «***monad***»' from any dimensional expression which it encloses [operates upon], viz., **[3 cms.]** = **cm**.

F.*E*.*D*. also notates, non-standardly, such that the "curved bracket" parentheses, **(...)**, denotes an operator which extracts the "'metrical quantifier'" from any dimensional expression it encloses [operates upon], as follows, e.g.: **(3 cms.)** = **3**.

Thus, also, **(3)** = **3**, and **[cm.]** = **cm.**, and **(cm.)** = μ_0 = **[3]**.

Ideogramic *Dimensional Analysis*

F.*E*.*D*. Standard Assignments / Interpretation of the

'***Metrical Qualifier Meta-Numbers***' of the $\underline{q}_7 \longleftarrow \underline{\underline{q}}_{MU} \equiv \underline{\underline{\mu}}$ Arithmetic

We '" ***assign*** "/" ***interpret*** '" [↔] the $\hat{\underline{\underline{\mu}}}^{\delta}_{\partial U}$ sub-species of *meta-numerals* that results from the $\underline{\underline{M}}$ subsumption of $\underline{U}$ as follows:

$\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_1]}$ ↔ $\underline{T}$, for the $\underline{T}$ime "*dimension*", meted in "*fundamental*" units of '**sec.**', thus denoted, still to this day, in "*syncopated*" fashion;

$\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_2]}$ ↔ $\underline{M}$, denoting the inertial $\underline{M}$ass "*dimension*", measured in "*fundamental*" units of grams, or **gm.**;

$\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_3]}$ ↔ $\underline{L}$, denoting the physical-spatial $\underline{L}$ength "*dimension*", measured in "*fundamental*" units of centimeters, or **cm.**, so that --

$\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_3 - \hat{\underline{u}}_1]}$ ↔ $\underline{V}$, denoting the physical-spatial $\underline{V}$elocity "*dimension*", measured in "*compound*" units of **cm. / sec.**;

$\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_3 - 2\hat{\underline{u}}_1]}$ ↔ $\underline{A}$, denoting the physical-spatial $\underline{A}$cceleration "*dimension*", measured in "*compound*" units of **cm. / sec.**^{2};

$\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_2 + \hat{\underline{u}}_3 - \hat{\underline{u}}_1]}$ ↔ $\underline{P}$, for the physical-spatial Momentum "*dimension*", measured in "*compound*" units of [**gm. × cm.**] / **sec.**^{1};

The 'compounded' dimension of $\underline{F}$orce, $\underline{F}$, thus translates to $\underline{\underline{ML}} / \underline{T}^2$, and thus also to $\underline{\underline{MV}} / \underline{T}$, and to $\underline{\underline{MA}}$, and to $[\hat{\underline{\underline{\mu}}}^{\delta}_{\hat{\underline{u}}_2} \times \hat{\underline{\underline{\mu}}}^{\delta}_{\hat{\underline{u}}_3} / \hat{\underline{\underline{\mu}}}^{\delta}_{\hat{\underline{u}}_1}{}^2]$.

The latter, because multiplying amongst $\hat{\underline{\underline{\mu}}}^{\delta}_{\partial U}$ meta-numerals equates to *additions* of their subscripts, *dividing to subtracting*, equates to $\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_2 + \hat{\underline{u}}_3 - 2\hat{\underline{u}}_1]}$, in [**gm. × cm.**] / **sec.**^{2}, or **dynes** –

$$(\underline{G})[\underline{G}] = (G)[\underline{G}] = G\underline{G} = (6.67\times10^{-8})[\text{dyne} \times [\text{cm.}^2/\text{gm.}^2]] \leftrightarrow ((6.67)(10^{-8}))[[\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_2 + \hat{\underline{u}}_3 - 2\hat{\underline{u}}_1]}][\hat{\underline{\underline{\mu}}}^{\delta}_{[+2\hat{\underline{u}}_3}} / \hat{\underline{\underline{\mu}}}^{\delta}_{[+2\hat{\underline{u}}_2]}]] =$$

$$((6.67)(10^{-8}))[\hat{\underline{\underline{\mu}}}^{\delta}_{[+\hat{\underline{u}}_2 + \hat{\underline{u}}_3 - 2\hat{\underline{u}}_1 + 2\hat{\underline{u}}_3 - 2\hat{\underline{u}}_2]}] = ((6.67)(10^{-8}))[\hat{\underline{\underline{\mu}}}^{\delta}_{[-\hat{\underline{u}}_2 + 3\hat{\underline{u}}_3 - 2\hat{\underline{u}}_1]}],$$

-- wherein **G** denotes the Newtonian "Universal" '$\underline{G}$ravitic' "constant" ***quantifier***, and $\underline{G}$ its ***metrical qualifier***.

Ideogramic *Dimensional Analysis*

Proof of the *Quotients of Dimensions* Theorem for the

'*Metrical Qualifier Meta-Numbers*' of the $\underline{\mathbf{q}}_7 \longleftrightarrow \underline{\mathbf{q}}_{MU} \equiv \underline{\mu}$ Arithmetic

Theorem 2. *Quotients of Dimensions.* ⊩ *The quotient of the dimensions of two variables is the dimension of the quotient of those two variables* ⊣, or: ⊩ $[V_1] / [V_2] = [V_1 / V_2]$ ⊣, or: ⊩ $[\underline{\Psi}_1] / [\underline{\Psi}_2] = [\underline{\Psi}_1 / \underline{\Psi}_2]$ ⊣.

Proof of Theorem **2**.

Via Szirtes' Ideography	#	Via the $\underline{\mu}$ Ideography for *Dimensional Analysis*	
Proposition		Proposition	Justification
⊩ $[V_1]/[V_2] = d_1/d_2 = d$	1	$[\underline{\Psi}_1]/[\underline{\Psi}_2] = \underline{\mu}^{\hat{0}}_{\sum_j \alpha_j \hat{\underline{u}}_j} / \underline{\mu}^{\hat{0}}_{\sum_j \beta_j \hat{\underline{u}}_j} \equiv \underline{\mu}^{\hat{0}}_{\sum_j \alpha_j \hat{\underline{u}}_j - \sum_j \beta_j \hat{\underline{u}}_j}$	Definitions: V_k, $\underline{\Psi}_k$, & [...]; *Closure of dimensional division*
$V_1/V_2 = m_1 \times d_1/m_2 \times d_2 =$ $(m_1/1)(d_1/1)(1/m_2)(1/d_2)$	2	$\underline{\Psi}_1/\underline{\Psi}_2 = \mu_1 \times \underline{\mu}^{\hat{0}}_{\sum_j \alpha_j \hat{\underline{u}}_j} / \mu_2 \times \underline{\mu}^{\hat{0}}_{\sum_j \beta_j \hat{\underline{u}}_j}$	Definitions: V_k & $\underline{\Psi}_k$; Multiplicative inversion of magnitudes & dimensions
$(m_1/1)(1/m_2)(d_1/1)(1/d_2) =$ $(m_1/m_2) \times [d_1/d_2] = V_1/V_2$	3	$\mu_1 \times \underline{\mu}^{\hat{0}}_{\sum_j \alpha_j \hat{\underline{u}}_j} / \mu_2 \times \underline{\mu}^{\hat{0}}_{\sum_j \beta_j \hat{\underline{u}}_j} = (\mu_1/\mu_2) \times [\underline{\mu}^{\hat{0}}_{\sum_j \alpha_j \hat{\underline{u}}_j} / \underline{\mu}^{\hat{0}}_{\sum_j \beta_j \hat{\underline{u}}_j}]$	Rule of Commutation, applied to step **2**; Transitive Rule of Equality applied to steps **2** & **3**
$[V_1/V_2] = d_1/d_2 = d$	4	$[\underline{\Psi}_1/\underline{\Psi}_2] = \underline{\mu}^{\hat{0}}_{\sum_j \alpha_j \hat{\underline{u}}_j} / \underline{\mu}^{\hat{0}}_{\sum_j \beta_j \hat{\underline{u}}_j} \equiv \underline{\mu}^{\hat{0}}_{\sum_j \alpha_j \hat{\underline{u}}_j - \sum_j \beta_j \hat{\underline{u}}_j}$	Definition of [...]; *Closure of dimensional division*
$[V_1]/[V_2] = [V_1/V_2]$	5	$[\underline{\Psi}_1] / [\underline{\Psi}_2] = [\underline{\Psi}_1 / \underline{\Psi}_2]$ ⊣	Transitive Rule of Equality, applied to steps **1** & **4**; Q.E.D.

Section V:

An $_{N}\underline{Q}$ *Heuristic Model*

of the [*likely inadvertent*] *Dialectic* of

the "'Level I'" *Contents* of

Newton's 1687

‹‹*Philosophiæ Naturalis Principia Mathematica*››

[*Mathematical Principles of Natural Philosophy*]

The Final Paragraph of the Final Scholium of Newton's 1687 ‹‹*Principia*›› --

A Clue to the [Incomplete] Next Phases of Newton's "'Occult Forces'"-based, *anti*-Mechanistic Paradigm,

As Next Fruition, in part, of his Extensive [*Al*]Chemical Experiments:

Foreshadowings of the Faraday / Maxwell Dynamical Electromagnetic Field Theory, and of the 'Electro-Biology' Beyond

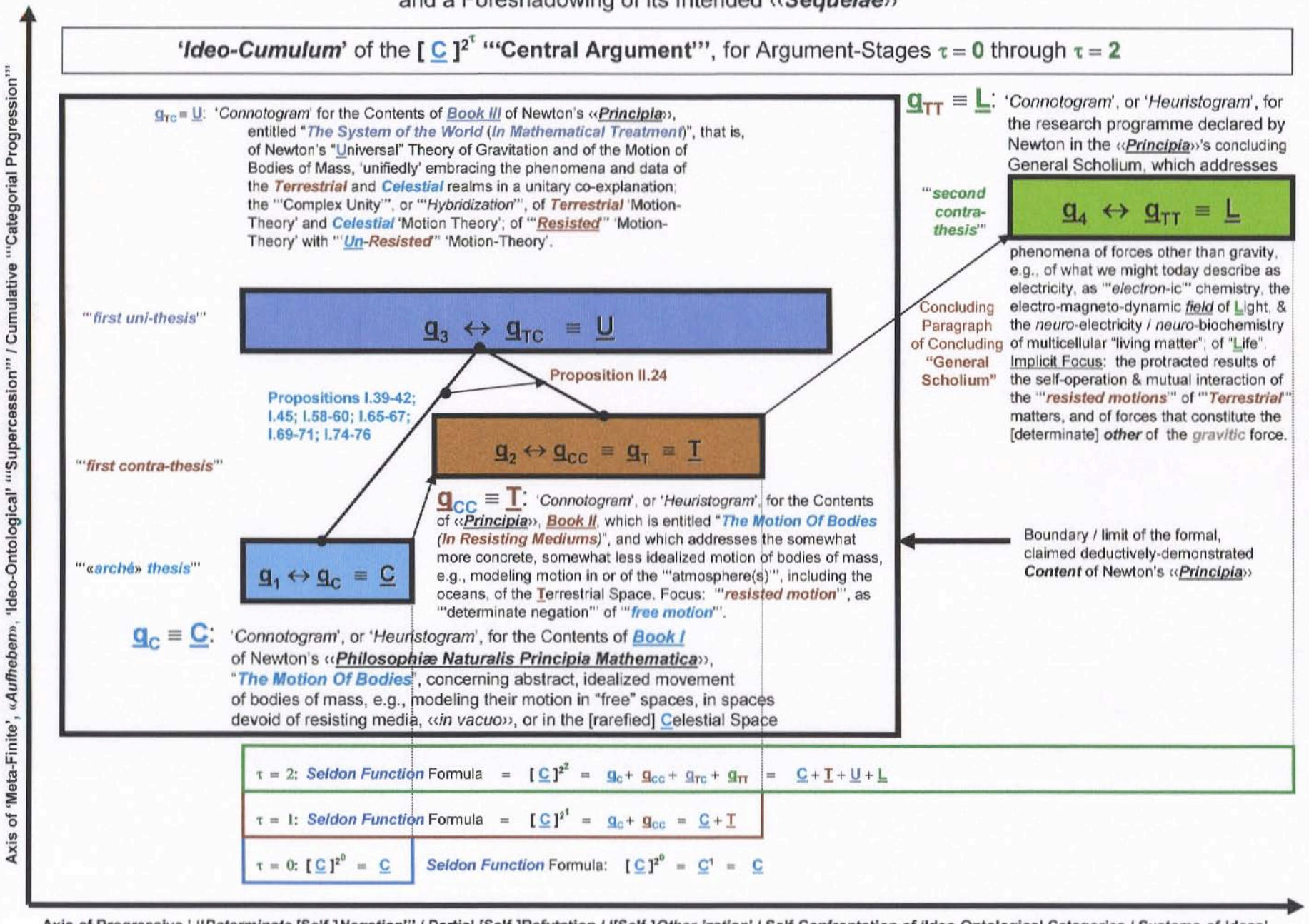
Recall: Per current theory, chemistry, about the ‹‹***autokinesis***›› of molecular+ matter, including of biological, cellular, and physiological, multi-cellular matter, is "'*electron*-ic'", involving interactions of the superficial, outermost electron orbitals & sub-orbitals of atoms, with lesser involvement of the nucleonic atomic core.

Isaac Newton, ‹‹***Philosophiæ Naturalis Principia Mathematica***››, or "***Mathematical Principles of Natural Philosophy***:

> "It would be appropriate to add some remarks about a certainly extremely subtle spirit pervading gross bodies and lying hidden in them, by whose force and actions the particles of bodies attract each other mutually at least distances, and stick together when brought into contact, and electrical bodies act at greater distances, both repelling and attracting neighboring corpuscles, and light is emitted, reflected, refracted, inflected, and heats bodies, and all perception is aroused, and the members of animals are moved by the will, that is, by vibrations of this spirit propagated through the solid filaments of the nerves from the external organs of perception to the cerebrum and from the cerebrum to the muscles. But these cannot be set forth in a few words, nor is there at hand a sufficient body of experiments by which the laws of action of this spirit are required to be accurately determined and shown."

Dana Densmore, **Newton's *Principia*: The Central Argument**, Book III: On The System of the World, *General Scholium* (1687), Green Lion Press [Santa Fe, New Mexico: 2003], p. 489.

«*Aufheben*» Diagram: An $_{N}\underline{Q}$ Heuristic Model of the '"Level I"' ***Systematic-Dialectical Structure*** of Newton's ‹‹*Principia*››, and a Foreshadowing of its Intended ‹‹*Sequelae*››



Section VI:

An $_{N}\underline{Q}$ *Dialectical Model* [Partial]

of

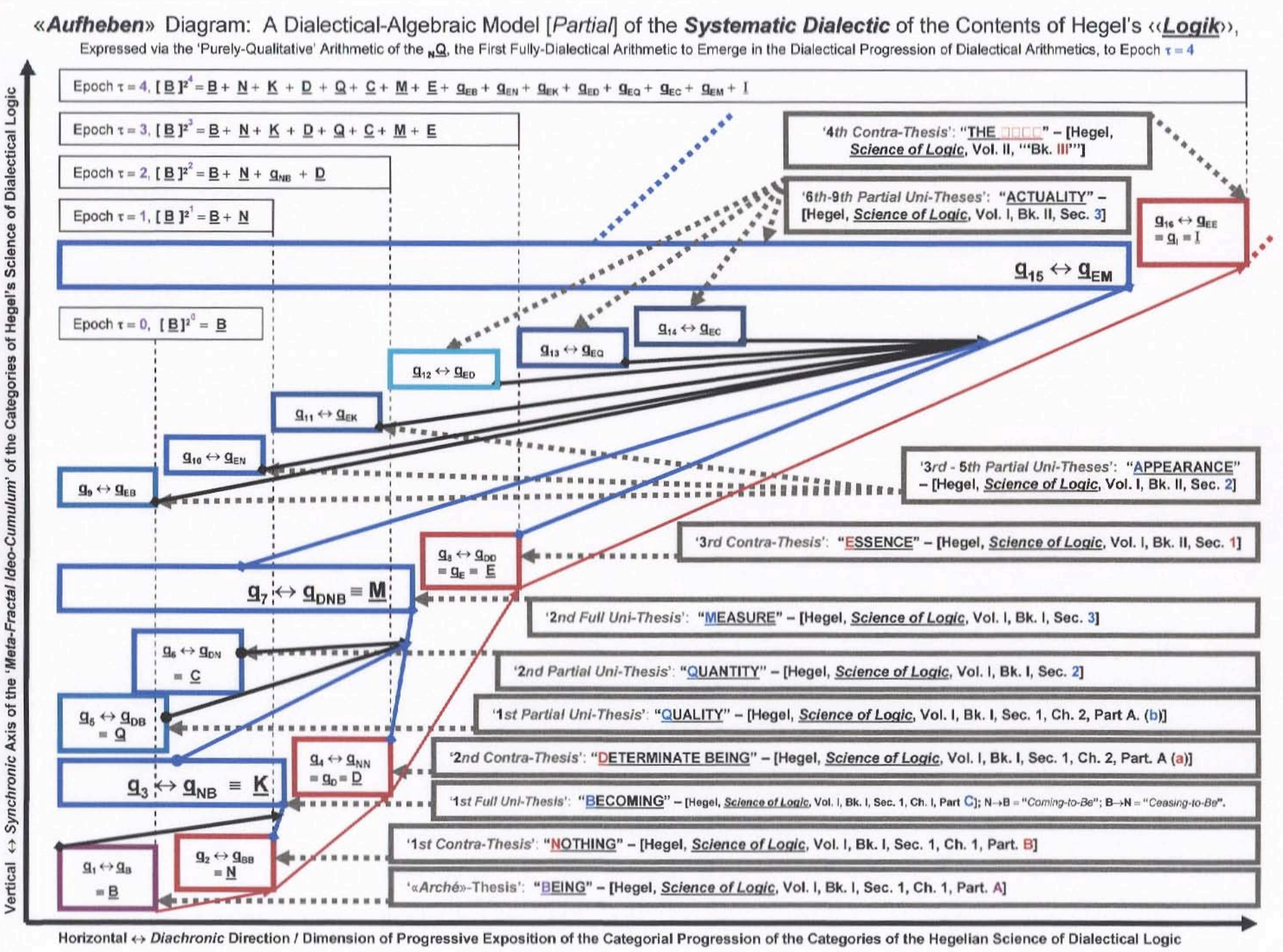
the *Detailed* ***Contents*** of

Hegel's 1812

Science of ‹‹Logik››

" ... the determinateness which was a result is itself, by virtue of the form of simplicity into which it has withdrawn, a fresh beginning; as this beginning is distinguished from its predecessor precisely by that determinateness, cognition rolls onward from content to content. First of all, this advance is determined as beginning from simple determinatenesses, the succeeding ones becoming ever ***richer and more concrete***. For the result contains its beginning and its course has enriched it by a fresh determinateness. The ***universal*** constitutes the foundation; the advance is therefore not to be taken as a ***flowing*** from one ***other*** to the next ***other***. In the absolute method the Notion ***maintains*** itself in its otherness, the universal in its particularization, in judgment and reality; *at each stage of its further determination it raises the entire mass of its preceding content, and by its dialectical advance it not only does not lose anything or leave anything behind, but carries along with it all it has gained, and inwardly enriches and consolidates itself.*"

G. W. F. Hegel, ***Science of Logic***, Volume Two, Section Three, Chapter 3, ***The Absolute Idea*** **(1812)**. [*emphasis* added by **F.E.D.**]


«Aufheben» Diagram: A Dialectical-Algebraic Model [Partial] of the Systematic Dialectic of the Contents of Hegel's ‹‹Logik››,
Expressed via the 'Purely-Qualitative' Arithmetic of the ₙQ, the First Fully-Dialectical Arithmetic to Emerge in the Dialectical Progression of Dialectical Arithmetics, to Epoch τ = 4
Epoch τ = 4, [B]² = B + N + K + D + Q + C + M + E + q_EB + q_EN + q_EK + q_ED + q_EQ + q_EC + q_EM + I
Epoch τ = 3, [B]² = B + N + K + D + Q + C + M + E
Epoch τ = 2, [B]² = B + N + q_NB + D
Epoch τ = 1, [B]¹ = B + N
Epoch τ = 0, [B]⁰ = B
'4th Contra-Thesis': "THE □□□□" – [Hegel, Science of Logic, Vol. II, "'Bk. III'"]
'6th-9th Partial Uni-Theses': "ACTUALITY" – [Hegel, Science of Logic, Vol. I, Bk. II, Sec. 3]
q_16 ↔ q_EE = q_I = I
q_15 ↔ q_EM
q_14 ↔ q_EC
q_13 ↔ q_EQ
q_12 ↔ q_ED
q_11 ↔ q_EK
q_10 ↔ q_EN
q_9 ↔ q_EB
'3rd - 5th Partial Uni-Theses': "APPEARANCE" – [Hegel, Science of Logic, Vol. I, Bk. II, Sec. 2]
'3rd Contra-Thesis': "ESSENCE" – [Hegel, Science of Logic, Vol. I, Bk. II, Sec. 1]
q_8 ↔ q_DD = q_E = E
q_7 ↔ q_DNB ≡ M
'2nd Full Uni-Thesis': "MEASURE" – [Hegel, Science of Logic, Vol. I, Bk. I, Sec. 3]
q_6 ↔ q_DN = C
'2nd Partial Uni-Thesis': "QUANTITY" – [Hegel, Science of Logic, Vol. I, Bk. I, Sec. 2]
q_5 ↔ q_DB = Q
'1st Partial Uni-Thesis': "QUALITY" – [Hegel, Science of Logic, Vol. I, Bk. I, Sec. 1, Ch. 2, Part A. (b)]
q_4 ↔ q_NN = q_0 = D
'2nd Contra-Thesis': "DETERMINATE BEING" – [Hegel, Science of Logic, Vol. I, Bk. I, Sec. 1, Ch. 2, Part. A (a)]
q_3 ↔ q_NB ≡ K
'1st Full Uni-Thesis': "BECOMING" – [Hegel, Science of Logic, Vol. I, Bk. I, Sec. 1, Ch. I, Part C]; N→B = "Coming-to-Be"; B→N = "Ceasing-to-Be".
q_2 ↔ q_BB = N
'1st Contra-Thesis': "NOTHING" – [Hegel, Science of Logic, Vol. I, Bk. I, Sec. 1, Ch. 1, Part. B]
q_1 ↔ q_B = B
'«Archê»-Thesis': "BEING" – [Hegel, Science of Logic, Vol. I, Bk. I, Sec. 1, Ch. 1, Part. A]
Vertical ↔ Synchronic Axis of the 'Meta-Fractal Ideo-Cumulum' of the Categories of Hegel's Science of Dialectical Logic
Horizontal ↔ Diachronic Direction / Dimension of Progressive Exposition of the Categorial Progression of the Categories of the Hegelian Science of Dialectical Logic

Section VII:

An $_{N}\underline{Q}$ *Heuristic Model*

of the [*possibly advertent*] *Dialectic* of

the "'Level I'" *Contents* of

Maxwell's 1873

A Treatise on Electricity and Magnetism

From the *Preface to the First Edition* of Maxwell's 1873

A Treatise on Electricity and Magnetism

"[‹‹*Archê*›› ***Thesis***] The fact that certain bodies, after being rubbed, appear to attract other bodies, was known to the ancients. In modern times, a great variety of other phenomena have been observed, and have been found to be related to these phenomena of attraction. They have been classed under the name ***Electric*** phenomena, amber, *ἤλεκτρον*, having been the substance in which they were first observed.

[First ***Contra-Thesis***] Other bodies, particularly the loadstone, and pieces of iron and steel which have been subjected to certain processes, have also been long known to exhibit phenomena of action at a distance. These phenomena, with others related to them, were found to differ from the electric phenomena, and have been classed under the name of ***Magnetic*** phenomena, the loadstone, *μάγνης*, being found in the Thessalian Magnesia.

[First ***Uni-Thesis***] These two classes of phenomena have since been found to be related to each other, and the relations between the various phenomena of both classes, so far as they are known, constitute the science of ***Electromagnetism***.

In the following Treatise I propose to describe the most important of these phenomena, to show how they may be subjected to measurement, and to trace the mathematical connexions of the quantities measured. Having thus obtained the data for a mathematical theory of ***electromagnetism***, and having shown how this theory may be applied to the calculation of phenomena, I shall endeavor to place in as clear a light as I can the relations between the mathematical form of this theory and that of ***the fundamental science of Dynamics***. ...

... some progress has been made in the reduction of electromagnetism to a dynamical science, by shewing that no electromagnetic phenomenon is contradictory to the supposition that it depends on purely dynamical action. ...

... I was aware that there was supposed to be a difference between Faraday's way of conceiving phenomena and that of the mathematicians, so that neither he nor they were satisfied with each other's language. I had also the conviction that this discrepancy did not arise from either party being wrong. ...

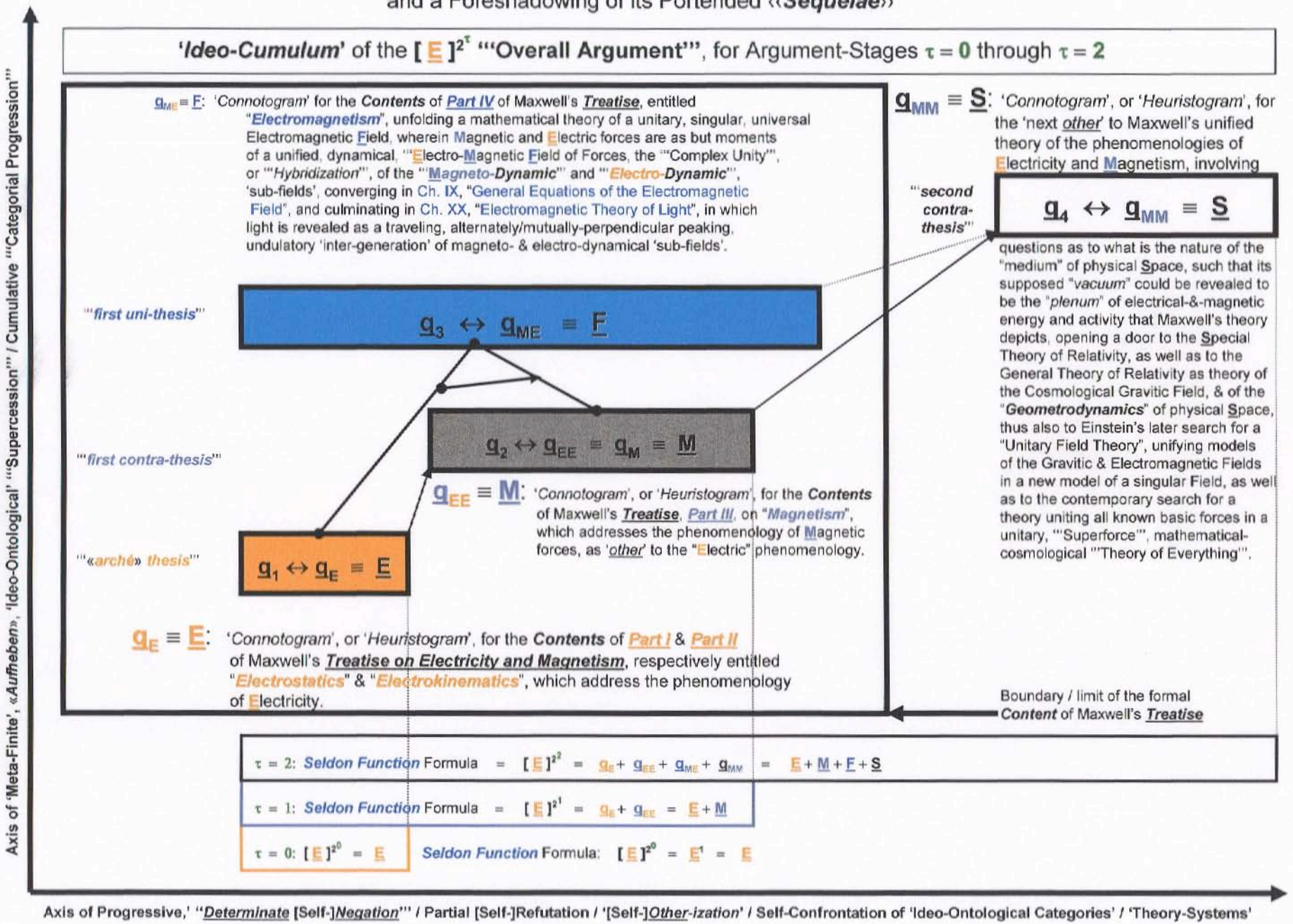
As I proceeded with the study of Faraday, I perceived that his method of conceiving the phenomena was also a mathematical one, though not exhibited in the conventional form of mathematical symbols. I also found that these methods were capable of being expressed in ordinary mathematical forms, and thus compared with those of the professed mathematicians.

For instance, Faraday, in his mind's eye, saw lines of force traversing all space where the mathematicians saw centres of force acting at a distance: Faraday saw a medium where they saw nothing but distance: Faraday sought the seat of the phenomena in real actions going on in the medium, they were satisfied that they had found it in a power of action at a distance impressed on the electric fluids.

When I translated what I considered to be Faraday's ideas into a mathematical form, I found that in general the results of the two methods coincided, so that the same phenomena were accounted for, and the same laws of action deduced by both methods, but that Faraday's methods resembled those in which we begin with the whole, and arrive at the parts by analysis, while the ordinary mathematical methods were founded on the principle of beginning with the parts and building up the whole by synthesis."

James Clerk Maxwell, **A Treatise on Electricity and Magnetism**, Preface to the First Edition (1873), Oxford University Press [NY: 2002], pp. v-vi; vii; viii-ix [**bracketed inserts & *colored text emphasis by* F.E.D.**].

«*Aufheben*» Diagram: An $_{N}\underline{Q}$ Heuristic Model of the '"Level I"' ***Systematic-Dialectical Structure*** of Maxwell's ***Treatise***, and a Foreshadowing of its Portended ‹‹***Sequelae***››



Some Significances of the Emergence of the '***Neo-Ideo-Ontology***' of the ***Universal*** *Electromagnetic* ***Field*** in **Maxwell**'s [and **Faraday**'s] Theories

"The weaving of the of the two strands of Lagrange's equation is nearly complete – only one step remains to effect the junction that will bring the electromagnetic field into full life. In principle, this step too is hardly more than a logical consequence of all that has been said thus far. For if the displacement does in this way constitute a true current, it must have the magnetic effect that we studied earlier as the Oersted phenomenon. It is easiest to express this by asserting that a changing electric field, necessitating as it does a changing displacement and thus constituting a true current, must give rise to the corresponding magnetic field; we would write, as Maxwell does:

$$4\pi\mathbf{j} = \text{curl } \mathbf{B} \qquad \text{(E)}$$

where here too **j** represents total current density, that is, the sum of conduction current $\mathbf{j}_c$ and changing displacement **D**. In free space there are no conductors, so equation (E) there becomes $4\pi\mathbf{D} = \text{curl } \mathbf{B}$, simply.

In reading this equation, we should be careful once again not to speak as if the two strands, the electric and magnetic, represent distinct fields. Maxwell has presented them as constituting two modes of motion of a single entity. ...

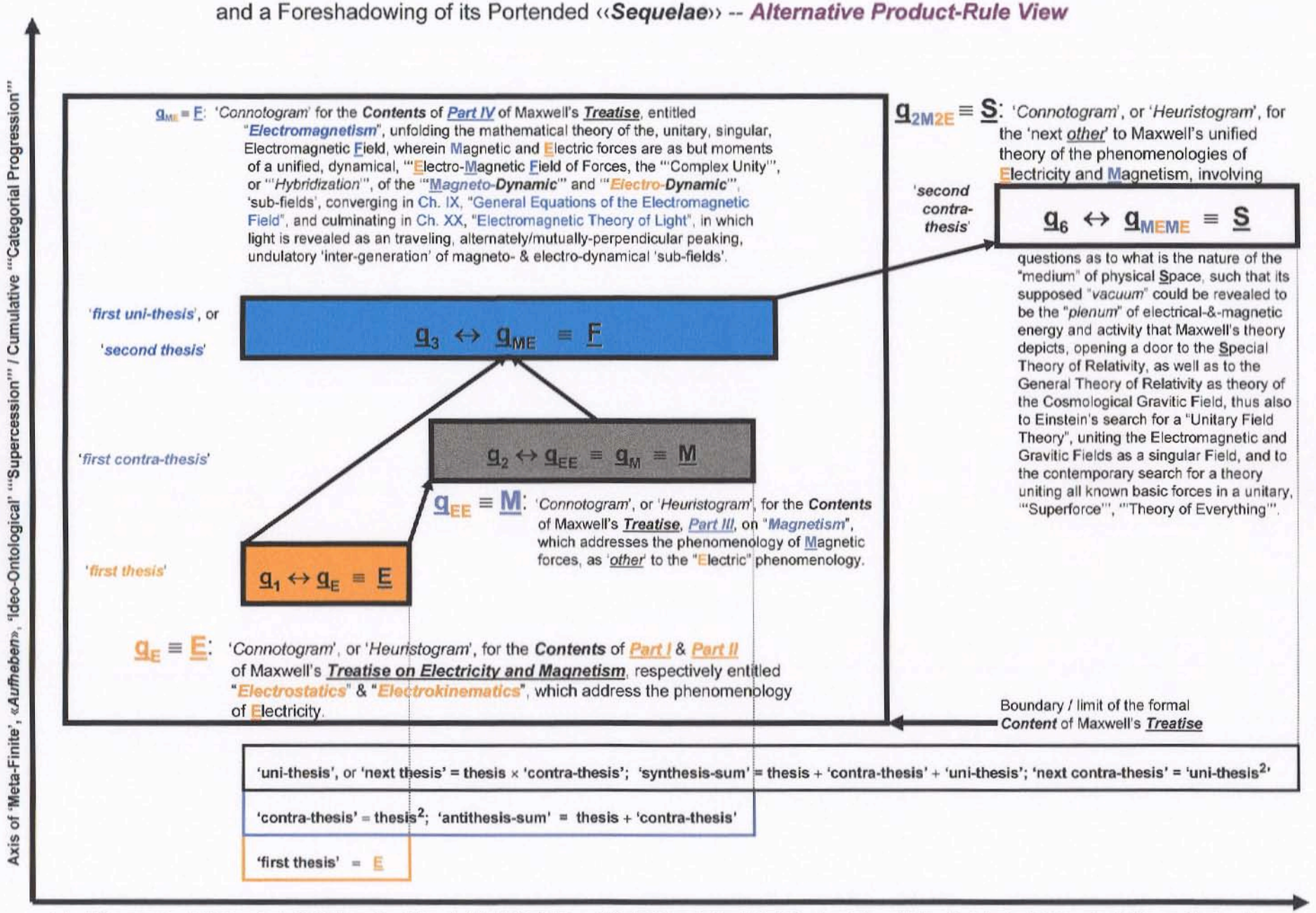
Maxwell has now brought forth the revolutionary vision which the *Treatise* set out to manifest. A new kind of physical entity has emerged: the electromagnetic field, infused with interactive life. Our grasp of the field owes its wholeness, as well as its intelligibility, to Lagrange's new approach to physical science, an approach in many ways the opposite of the science of Newton. Here the whole is primary, the quantity best known to us is energy, and the language has become that of the metaphor of generalized variables – while the underlying matter, whatever it may be, remains known to us only by its most generalized name, *y*. The the substance of this new entity may be, as we have urged, no less real for being metaphorical. Its two modes of energy, kinetic and potential, configured in space, generate the patterns we know as the magnetic and electric fields; together, they constitute the unifying reality that is the *electromagnetic field*.

With this realization completed by the end of Chapter IX, Maxwell will go on in Chapter XX to show mathematically that these equations insure the propagation of wave motion throughput the body of this new medium. The velocity of this wave, though, is an empirical question, since the coefficients in the equations we have set out are no more than placeholders for numbers yet to be determined by laboratory measurements. Much of the remaining work of the *Treatise*, then, will be to determine these coefficients by exacting experiment and thereby compute the velocity of the predicted wave motion. Within limits of experimental accuracy, it proves to equal the measured velocity of light. Latent, then, in Maxwell's equations as they have been set forth here, is the *electromagnetic theory of light*.

If this connected system we are calling the field be the medium of the phenomenon of light, then its body must fill the cosmos to the furthest reaches to which vision penetrates. This new entity becomes, in a sense, the body of the cosmos, whose motions are light. Perhaps, then we should speak not just of the electromagnetic theory of *light* but, more fundamentally, of **the *electromagnetic theory of space***."

Thomas K. Simpson, ***Figures of Thought***: ***A Literary Appreciation of Maxwell's Treatise on Electricity and Magnetism***, Green Lion Press [Santa Fe, New Mexico: 2005], pp. 114-116 [***emphasis*** added by **F.E.D.**].

«*Aufheben*» Diagram: An $_{N}\underline{Q}$ Heuristic Model of the '"Level I"' ***Systematic-Dialectical Structure*** of Maxwell's ***Treatise***, and a Foreshadowing of its Portended ‹‹***Sequelae***›› -- ***Alternative Product-Rule View***



Section VIII:

An $_{N}$Q Heuristic Model [Partial]

of the ***Dialectic*** of

the *Detailed* ***Contents*** of

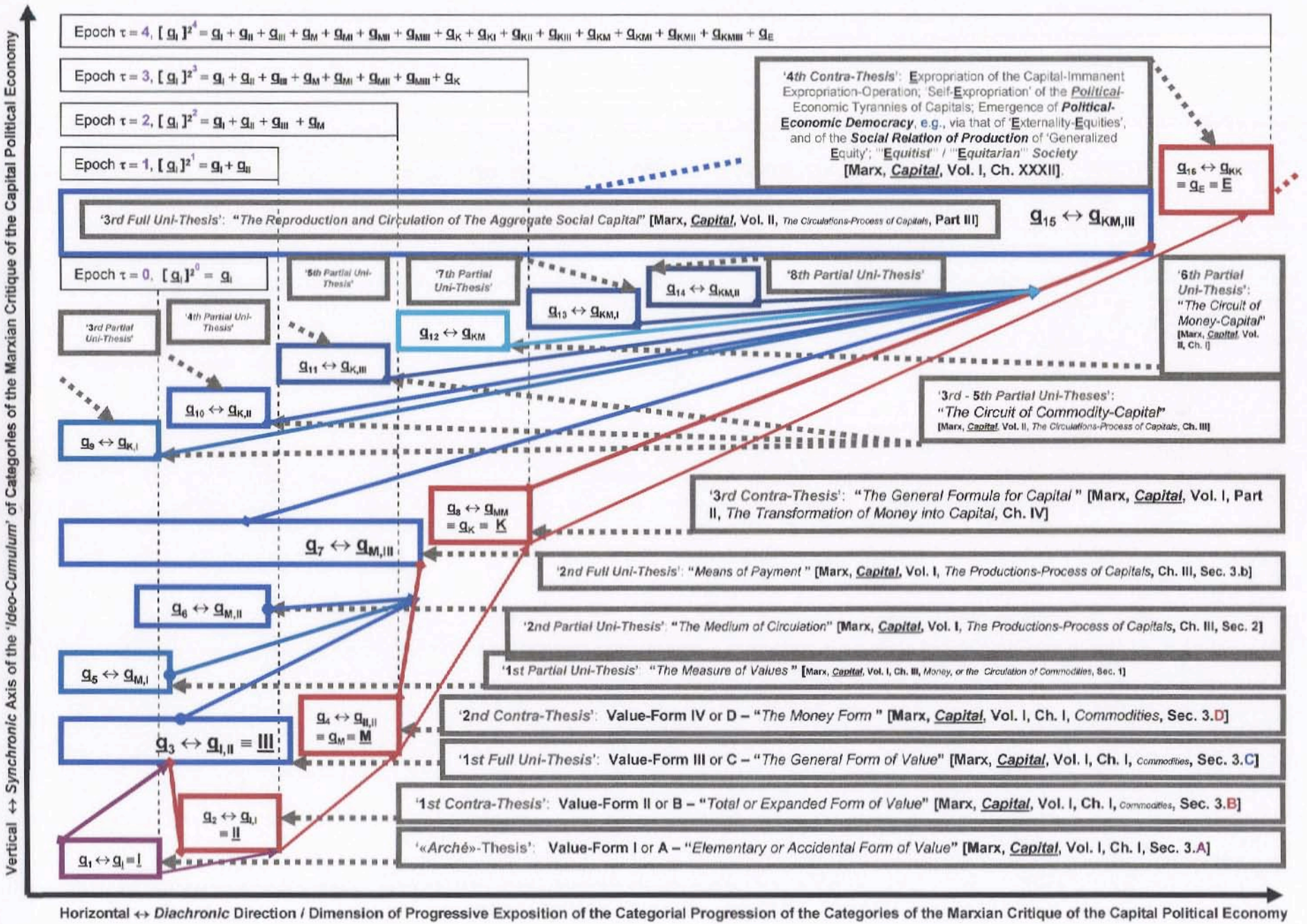
Marx's 1867

Capital*: *A Critique of Political Economy

"[That] Every beginning is difficult, holds in all sciences. To understand the first chapter, especially the section that contains the analysis of commodities, will, therefore, present the greatest difficulty. ... The value-form, whose fully-developed shape is the money-form, is very elementary and simple. Nevertheless, the human mind has for more than 2,000 years sought in vain to get to the bottom of it, whilst on the other hand, to the successful analysis of much more composite and complex forms, there has been at least an approximation. Why? Because the body, as an organic whole, is more easy of study than are the cells of that body. In the analysis of economic forms, moreover, neither microscopes nor chemical reagents are of use. The force of abstraction must replace both. But in bourgeois society the commodity-form of the product of labour -- or the value-form of the commodity – is the economic cell-form."

Karl Marx, ***Capital***: ***A Critique of Political Economy***, Volume I, Preface to the First German Edition **(1867)**

«***Aufheben***» Diagram: A Dialectical-Algebraic Model [*Partial*] of the ***Systematic Dialectic*** of the Contents of Marx's ‹‹***Das Kapital***››, Expressed via the 'Purely-Qualitative' Arithmetic of the $_{N}\underline{Q}$, the First Fully-Dialectical System to Emerge in the Dialectical Progression of Systems of Dialectical Arithmetic



"The general remarks, which the credit system so far elicited from us, were the following: . . .

III. ***Formation of stock companies***. Thereby: . . . 3) Transformation of the actually functioning capitalist into a mere manager, administrator of other people's capital, and of the owner of capital into a mere owner, a mere money-capitalist. Even if the dividends which they receive include the interest and the profit of enterprise, i.e., the total profit (for the salary of managers is, or should be, simply the wage of a specific type of skilled labour, whose price is regulated in the labour-market like that of any other labour), this total profit is henceforth received only in the form of interest, i.e., as mere compensation for owning capital that is now entirely divorced from the function in the actual process of reproduction, just as this function in the person of the manager is divorced from ownership of capital. ... In stock companies the function is divorced from capital ownership, hence also labour is entirely divorced from ownership of means of production and surplus-labour. ***This result of the ultimate development of capitalist production is a necessary transitional phase*** towards the ***reconversion of capital into the property of producers***, although no longer as the private property of the individual producers, but rather as ***the property of associated producers***, as ***outright social property***. On the other hand, the stock company is a transition toward the conversion of all functions in the reproduction process which still remain linked with capitalist property, into mere functions of the ***associated producers***, into social functions.

This is ***the abolition of the capitalist mode of production within the capitalist mode of production itself***, and hence a self-dissolving contradiction, which *prima facie* represents a mere phase of transition to a new form of production. It manifests itself as such a contradiction in its effects. It establishes a monopoly in certain spheres and thereby requires state interference. It reproduces a new financial aristocracy, a new variety of parasites in the shape of promoters, speculators, and simply nominal directors; a whole system of swindling and cheating by means of corporation promoting, stock issuance, and stock speculation. It is private production without the control of private property. ...

The ***co-operative factories*** of the labourers themselves represent within the old form the first sprouts of the new, although they naturally reproduce, and must reproduce, everywhere in their actual organization all the shortcomings of the prevailing system. But ***the antithesis between capital and labour is overcome within them***, if at first only by way of making the associated labourers into their own capitalist, i.e., by enabling them to use the means of production for the employment of their own labour.
[*we call this transitional form* '***workers' capital***[ism]'].

They show how a new mode of production naturally grows out of an old one, when the development of the material forces of production and of the corresponding forms of social production have reached a particular stage. Without the factory system arising out of the capitalist mode of production there could have been no co-operative factories. Nor could these have developed without the credit system arising out of the same mode of production. The credit system is not only the principal basis for the gradual transformation of capitalist enterprises into capitalist stock companies, but equally offers the means for the gradual extension of co-operative enterprises on a more or less national scale. ...

The capitalist stock companies, as much as the co-operative factories, should be considered ***transitional forms from the capitalist mode of production to the associated one***, with the only distinction that the antagonism is resolved negatively in the one, and positively in the other."

Karl Marx, ***Capital***: ***A Critique of Political Economy***, Volume III, Chapter VVVII, ***The Role of Credit in Capital***[ist] ***Production***, ***emphasis*** [*and* ***insert***] *added.*

Section IX:

The Dialectic

of

Democratic Self-Governance

within the

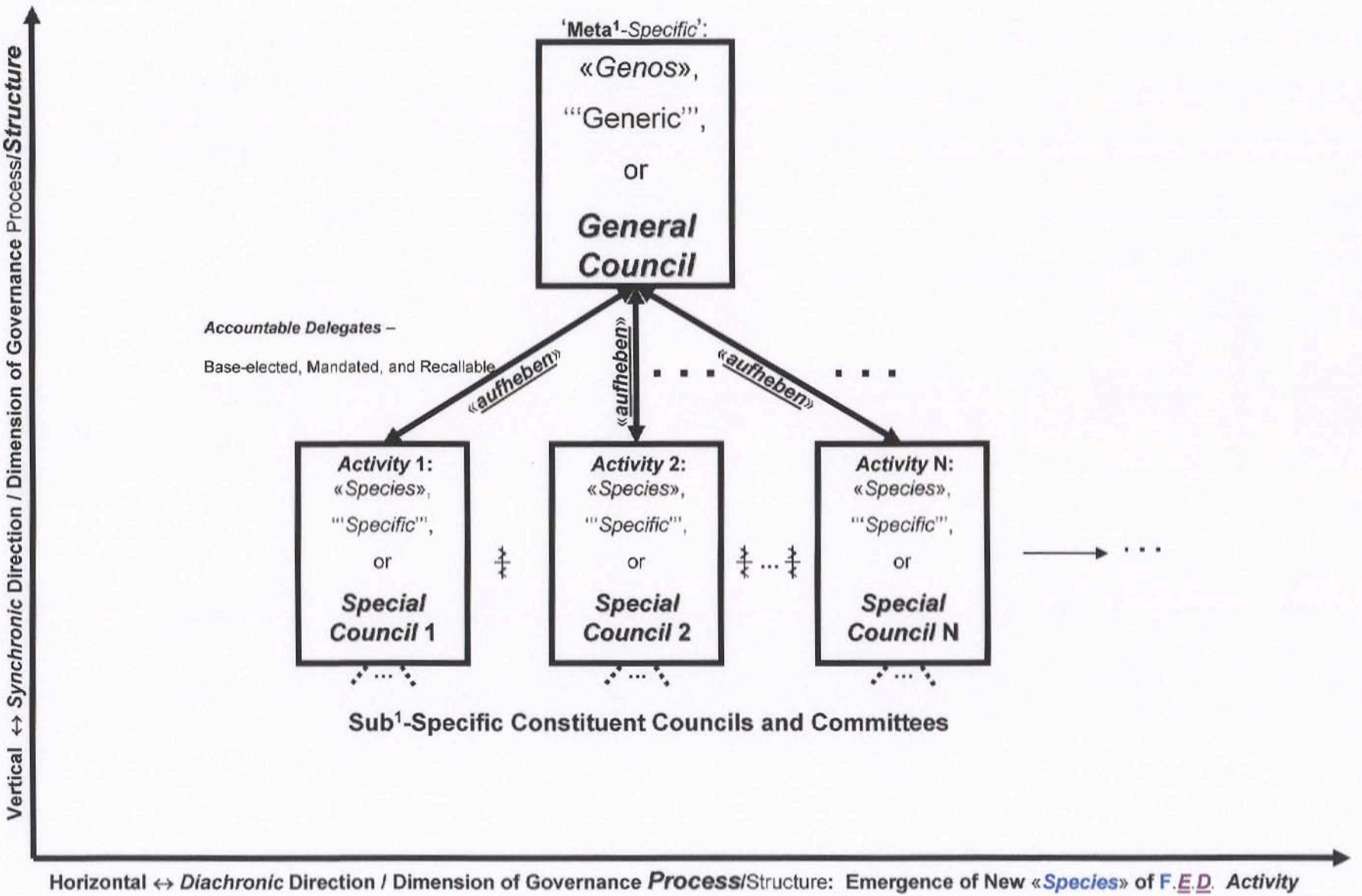
Capital-‹‹*Aufheben*›› *Relation of Production*

of

Generalized Equity

Synchronico-Diachronic «***Aufheben***» Diagram: '*Meta-Fractal Meta-Monadology*' of ***The Dialectic of Democratic Self-Governance***

Instance: Self-Governance Plan of **Foundation *Encyclopedia Dialectica*** [F.E.D.]



I. ***Capital*** is divided into four sections.

a) Capital en général [in Fr.] (*This is the material of the first brochure*).

b) *Competition* or the reciprocal action of the many capitals.

c) *Credit*, where capital appears as the general element in opposition to the many capitals.

d) ***Share capital*** as ***the most perfect form*** (assuming the character of ***communism***), together with all its ***contradictions***."

Letter, Marx to Engels, *April 2, 1858*; ***MEW*** 29, p. 312,

as reproduced in ***Rubel on Marx***: ***Five Essays***, Cambridge University Press [NY: 1981], p. 216,

colored-text italic and ***bold italic underlined emphasis*** added.

Synchronico-Diachronic «*Aufheben*» Diagram:

'*Meta-Monadological*' *Dialectic* of *Publicly-Owned* '*Externality Equities*' Collective Properties **Economic-Democratic Self-Governance** --

'*Baseocratic*' Structure/Process of Associations of *Publics-Elected* Public Directors [APDs], at Local, County, Provincial, Regional, National, Continental & Global Scales / Levels