Definition: ‘*The Principle of Metafinity*’.

Numerous succinct formulations of this ***principle*** are known, a few of which are the following --

Infinity is unmanifest.

Infinity does not actualize.

Infinity is never actually encountered empirically, not in the physical world “external to the human mind”, not even ‘intro-empirically’, “inside” the human mind itself.

Actual infinity does not manifest.

No infinity is actual -- only “potential” infinities exist in this finite-manifest universe, “potential infinities” whose “infinite potential” never fully actualizes.

Infinity is non-actual.

Commentary on this *Principle*: The “truth” of the theorems, etc., of a formal-logical, deductive system is only as good as the “truth” of its axioms/postulates, which the theorems’ “truths” “inherit”. The ancient dogma that the “truth” of every such deductively ***un***proven axiom is “self-evident” has long ago been refuted. But certain axioms of, e.g., ***Cantorian*** axiomatic set theories, assert existence of sets of ***actually infinite*** cardinality -- of ***infinite*** numbers of elements -- or assert that such sets can really be “constructed”. Such axioms not only lack such self-evidence, but are, indeed, ***self-evidently FALSE***. Of course, it is possible to rigorously deduce theorems from such ‘contra-experiential’, ‘contra-empirical’ postulates. But what results can only constitute, at best, a ***logically rigorous phantasy***. *Apparent* dynamical ‘‘‘metrical’’’ ***infinities***, e.g., of a unit-of-measure, metrical ‘‘‘qualifier’’’ unit, like “**gm**.**cm**./**sec**.”, if ‘‘‘modified’’’, or quantified, at, **&/**or after, a certain ***finite*** time-value, **t***, by an *apparently* ***infinite*** ‘‘‘quantifier’’’, do arise. They result via a suddenly-manifesting “division-by-zero” in a ratio-quantifier that is, e.g., ***finite*** for all **t < t***. We indeed find such values, resulting from a zero-multiplier’s *nullification* “***singularity***” of a denominator-resident metrical unit -- a unit ***essential*** [‘***essence***-ial’] to that dynamic system -- in apt, well-fitting mathematical models, modeling dynamical physical, empirical actualities. We find that they characteristically signify an ***existential*** *nullification*, and, indeed, an ***ontological*** *nullification*: sudden ‘dis-existentiation’ of one or more entities whose existence is assumed by the model specification. This is typically also accompanied by the irruption into existence of ‘‘‘new ontology’’’ -- of ***a*** kind, or of kind***s***, of entit(y)(ies) not included in the model specification, and [thus] ***not describable*** in the model’s language. ***Not describable***, that is, except ***negatively***, as an ***absence***, at/after **t = t***, of ontology whose *all*-time existence was presupposed by, or implicit in, the model specification. We signify this absence by axiomatically asserting, in the $_{R}^{\mu}$ ideography, the value which we call “full zero”, ⬮, as a generic value signifying such ***ontological***, ***existential absence***, resulting whenever a ‘metrical unit qualifier’ is *nullified* [i.e., is multiplied by the ‘‘‘quantifier’’’ value that we call “empty zero”, **0**]. In ***standard***, i.e., in the “***purely***”-***quantitative abstractions*** of such ***dynamic system models***, which *exclude* all algebraic ‘‘‘***qualifiers***’’’, ‘‘‘***metrical***’’’ or otherwise, *apparently* ***infinite quantitative change*** remains as the only available, “***purely***”-***quantitative expression*** of ***qualitative***, ***ontological***, ‘***metafinite***’ ***change***.

Definitions: ‘*Metafinite Difference*’ & ‘*Metafinite Change*’.

‘***Metafinite Difference***’ ≡ ***Qualitative difference***, ***difference*** of ***kind***, in the form of ***ontological difference*** – a ***contemporary difference*** in ***ontology***. We observe a ‘***double-conservation***’ «***aufheben***» ***character*** in ***cosmos-history*** -- as *modeled mathematically* via the ‘***double-conservation*** «***aufheben***» ***product rule***’ ***axiom*** of the $_{N}Q_{}$ [*q.v.*] ***dialectical arithmetic*** – by which ***older ontology*** is «***aufheben***»-***conserved*** both ***internally***, *inside* the ***individual units*** of the ***newer ontology*** which arises out of the ***older***, **&** also ***externally***, ‘***evolutely***’, as the *persistence in existence* of the ***units*** of the ***older ontology***, never yet organized to any level *higher* than that *connoted* by their ***older category***. Therefore, the ***presentation*** of ***present***, ***synchronic sample*** “***slices***” of ***contemporary*** *reality*, that is, of the ***categories*** that *comprehend sub-systems* of the ***total cosmos-system***, *sub-totalities* of that ***totality***, ***presented*** in ***systematic***, *taxonomic order*, e.g., by the ***method*** of ‘“***systematic dialectic***”’, or of certain ***species*** of ‘***meta-systematic dialectic***’, encounter ***units*** differing in ***kind*** – not *all* of *one* ***kind*** only – **&** thus requiring *representation* by ***different ontological categories***, forming, in “*purely*”-***qualitative*** terms, a ‘***qualo-fractal***’, scaled similarity ‘***content-structure***’. For example, for the ***E.D.*** ‘Taxonomy Level **1**’ of the ***total cosmos***, such a ‘***qualo-fractal***’ is formed by the ***.../atoms/molecules/- prokaryotic cells/eukaryotic cells/multi-[eukaryotic]cellular organisms/...*** *sequence* of ***ontological categories***, whose ***units*** are ***present***, *all together*, *all at once*, in, e.g., the ***contemporary***, Terran locus of that ***total cosmos***. It might seem, upon *first* impression, that, e.g., ***eukaryotic cells*** are “***infinitely*** ***different*** – “***infinitely***” *more advanced*, in their *self-organization*, than are, e.g., ***atoms***. However, upon sober reflection, it is realized that this ***difference***, composed of myriads of constituent ***sub-differences*** -- which are, without a doubt, breathtakingly *vast* -- are, still, *all*, nonetheless, ***finite***. We refer to such ***finite***, but *vast*, *qualitative*, ***ontological differences*** as ‘***METAfinite Differences***’.

‘***Metafinite Change***’ ≡ Past ***historical*** *processes* of ‘***metafinite change***’ are the *processes* that have given rise to ***contemporary*** ‘***metafinite difference***’. ‘***Metafinite change***’ is the ***kind*** of ***change*** that results from an ***historical*** *process* of ‘***onto-dynamasis***’, **&**, typically, from an ***historical*** *process* of «***aufheben***» ‘***self-meta-unit-ization***’, or of ‘***self-hybridization***’ [‘***auto-hybridization***’], as well as from ‘***mere hybridization***’ [‘***allo-hybridization***’], of the many ***units*** *represented* by ***ontological categories***. ‘***Metafinite change***’ is “‘***revolutionary***’” ***change***, by which we mean ‘***ontology-change***’, e.g., typically, ‘***ontology*** [***net***-]***expansion***’. ‘***Metafinite change***’ is the ***kind*** of ***change*** that is *associated* with ‘***meta-evolution***’, **&** with ‘***meta-dynamics***’ – or with ‘***meta-dynamasis***’ – rather than with ***mere*** “***dynamics***”, or with “*purely*”-***quantitative***, ***merely*** “***evolutionary***” ***change***. ‘***Metafinite change***’ arises when ***units*** of a given ***kind*** *expandedly reproduce* their *populations* to the point of crossing a *critical density threshold*, after which *their* further *self-reproduction*, in effect, *advances qualitatively*, no longer ***only quantitatively***, by *producing*, for the *first time*, in *their* locus, or even in ***the cosmos as a whole***, ***un***precedented, never-before-manifested, ‘***meta-units***’, requiring a ***new ontological category*** for *their comprehension*. **Example**: The «***aufheben***» ‘***self-meta-unit-ization***’, ’ of ***pre-atomic*** “***particles***” to form the ***first atoms*** – in “***cosmological*** nucleosynthesis”.

Definition:

‘dynamical singularity in general’.

‘dynamical singularity in general’ ≡ in a dynamical mathematical model, “‘singularity’” marks the moment of ‘ontological revolution’, the moment when a ‘meta-dynamicity’ manifests, in the form of the irruption of new ontology &/or of the concurrent [partial, local] disappearance of old ontology – e.g., of ‘ontological conversion’, the [self-] conversion of old ontology into new. In an equation modeling the “purely” quantitative evolution of a dynamical system – e.g., changes “with time” in the values of state-variable quantifiers, &/or of control-parameter quantifiers, only, “‘singularity’” marks the moment when “‘qualitative change’” – “‘ontology change’” – i.e., when ‘ontologically revolutionary’ change, or ‘meta-evolutionary change’, manifests. In “purely”-quantitative -- i.e., in ontologically & metrically ‘unqualified’ – merely dynamical model equations, when the resulting new ontology and new ‘meta-state’ is beyond the [usually only implicit] “‘ontological commitments”’ of the “‘model specification”’, & beyond the expressive capability of the mathematical language in which the model is rendered, dynamical singularity typically takes the form of a division by **0**, i.e., by ‘empty zero’, arising at a finite value of the **t**ime parameter, the ‘dynamical parameter’, **t** ∈ **R**, which means that the dynamical system has “evolved”, as of that singular value of the **t** “independent” variable, to an “‘indeterminate”’, “‘undefined”’ state, one inexpressible, in any specific way, by the “purely”-quantitative dynamical model, or that an ‘infinity residual’ arises at that “point in time”, i.e., an apparently quantitatively infinite error in the model’s state-predictions. If such “‘incomplete”’ dynamical equations are ‘re-qualified’, using, e.g., the ‘ontological qualifier’ [state-variable &/or control-parameter “‘qualifier”’] &/or the “dimensional analysis” ‘metrical qualifier’ ‘meta-numbers’ of the Seldonian 7th system of dialectical mathematics, $_{R^{\mu}_{=}}$, then the state of the system as of its metafinite singularity takes a generic value ●, ‘full zero’, simply signifying that the new [meta-]dynamical [meta-]state of the [now meta-]dynamical system **cannot** be specifically expressed within the mathematical language of the equation, & of its [implied] ontology, & **not at all** that any state of absolute **or** abstract nothingness arises as of that “‘singular”’ value of **t**. If an ontologically and metrically qualified, ‘meta-dynamical’, ‘meta-evolution equation’-model, & one whose “‘model specification”’ takes ‘onto-dynamasis’ into account, is used to describe the same phenomenology, the same ‘meta-evolutionary’ sequence, then a dynamicity of the geometry of the state-variables’ state-**space itself**, &/or of the parameters’ control-**space itself** – a dynamical, evolving ‘state/control meta-space’ -- is described by that model, with new state-variable &/or new control-parameter dimensions irrupting, at “‘singular”’ moments, “‘from the **origin**”’ of that ‘meta-space’, & also, perhaps, some such dimensions disappearing at such moments, & perhaps with movements/-reclassifications, at such moments, of some dimensions to or from the state-variable sub-space, to or from the control-parameter sub-space, of that united, or unified, ‘meta-dynamical meta-space’, so that a specific account of what irrupts at & beyond (the) moment(s) of dynamical singularity can be rendered.

Definitions:
"*Infinite*" "Singularity" vs. '*Metafinite Singularity*'.

"***Infinite***" "**Singularity**" ≡ The "***un***defined", "***in***determinate", "meaningless" – supposedly '***un***semantifiable' – state that arises, e.g., in a [***nonlinear***] **differential** ***equation***, **&/**or in the ***solution*** to that ***equation***, when that ***equation*** describes the "'***law of change*** [***of state***]"', the ***specific*** "***law of motion***", the "***dynamic***", the "***evolution***" – the "***state-space trajectory***" -- of a given "***dynamical system***", due to the *emergence*, at a ***finite*** "point in time", **t = t∗**, for that ***equation***, at which the ***denominator*** of the **RHS** [**R**ight-**H**and **S**ide] of that "*purely*"-***quantitative*** "'***evolution equation***"', **&/**or of the ***solution*** to that ***equation***, takes on the value **0**, which we call '***empty-zero***'. This induces a "'*division*-by-zero"', an "'***unsolvable***"' "zero *division*", or a value of "***infinity***" which resides outside the closure of the *number-space* of the *axiomatic system* of *arithmetic*, e.g., the **R**, or "**R**eal" *numbers*, *system*, which forms the basis of the *mathematical language* of the '***equation-model***' for the given ***dynamical system***. This «***zusammenbruch***», or "***breakdown***", of such an '***equation-model***', results in an '***infinity residual***' , **(f – ∞)** -- a ***quantitatively*** '***infinitely wrong answer***' by that '***equation-model***', since the ***true answer*** is always a ***finite*** value, here denoted by **f**; a total ***failure mode*** for "***purely***"-***quantitative*** **/** '***unqualified***' '***equation-models***' , lacking both ***arithmetical*** "'***ontological qualifiers***"', **&** ***arithmetical*** "'*metrical qualifiers*"'. **Examples**: The Newton gravitational '***equations-system***' at the *moment* of ***collision*** between **2** gravitating bodies of a **2 ≤ n**-body ***system***, bodies modeled as "mass-points". The General Relativity ***equations*** for the gravitic "complete" *collapse* **/** "'*point-collapse*"' of a super-massive star. The self-induced "***self-energy***" of a pre-nuclear "***point-particle***". The key ***class*** of the ***nonlinear*** differential *equations* are uniquely prone to such "'singular"' ***failure modes***.

'***Metafinite Singularity***' ≡ A ***finite value*** that arises in a 're-***qualified***' ***dynamical*** '***equation-model***' – e.g., in a $_{R}\mu_{-}$ ***equation*** whose *constituent* constants **&** variables are collectively ***multiplied*** by the appropriate ***arithmetical*** '***metrical qualifier***(***s***)' **&/**or '***ontological qualifier***(***s***)' -- when the ***quantifier*** of a ***factor*** in the ***denominator*** of a so 're-***qualified***' '***equation-model***' takes the value '***empty-zero***', **0**, at a ***finite*** value of ***its*** time parameter, **t = t∗**, for that '***equation-model***'. If the defined ***ontological content*** of the **t ≥ t∗** ***states*** of the, e.g., ***dynamical system modeled*** by that '***equation-model***' are outside the "'***ontology***"', the "'ontological commitments"' of ***its*** "'model specification"', then the **t∗ +** state(s) of that '***equation-model***' take on the value '***full zero***',●, which ***signifies*** an '***ontological revolution***' – the ***irruption*** of ***new*** "'***ontology***"', **&/**or the [*local*] ***disappearance*** of [*some* of] the ***old*** "'***ontology***"', the "'***old ontology***"' to which the "'model specification"' is ***solely*** committed. The *axiomatic* ***irruption*** of the ***new*** '***ideo-ontology***' of '***full zero***', **&** of the *capability* to apply '***arithmetical metrical qualifiers***' **&** '***arithmetical ontological qualifiers***', so as to '***re-qualify***' formerly '***un***qualified', "***purely***"-***quantitative mathematical models***, ***arises*** *beginning* with $_{R}\mu_{-}$, the **7**th ***dialectical arithmetic*** in the Seldonian ***dialectic of the dialectical arithmetics***.

Definition: ‘***metafinite resonance singularity***’.

‘***metafinite resonance singularity***’ ≡ The ***kind*** of ‘***ontodynamical*** ***singularity*** that *arises*, in the course of the “*purely*” ***quantitative expanded reproduction*** of a *local* “**population**”, or *local* «***arithmos***», of «***monads***», i.e., of ‘***ontological units***’, or ‘***units of ontology***’, *represented* by that «***arithmos***» as *local* instantiation of a given ‘***ontological category***’, when the *local* environment of that *local* ‘‘‘**population**’’’, matches, mirrors, or ‘‘‘reflects’’’ that **population itself***, so that this *condition* of the ‘**self**-environment’, of the ‘**self**-surroundment’, or ‘**self**-envelopment’ of those ***units*** crosses a ***critical density threshold***, a *physical-spatial* ***concentration threshold***, after which interactions of ‘‘‘**like kind** with **like kind**’’’, or of ‘**kind** with **itself**’, begin to predominate, *locally*, over interactions of ‘***likes*** with ***unlikes***’**/**‘***kind*** with ***predecessor kind***’, which predominated ***previously***, at a lower stage of the ***quantitative self-reproduction/-accumulation*** of «***monads***» of the ***kind*** in question, in a state of ‘***earlier-other environ-ment***’, ‘***earlier-other surround-ment***’, or ‘***earlier-other envelopment***’ of those «***monads***» in the subject *locus*. The dominance of such *local* ‘**kind self**-interaction’* gives rise to *locally* ***un***precedented, **new kinds** of phenomena, **new kinds** of behavior, **new** dynamics, **new** ‘‘‘laws[-of-motion]’’’ – to yet (a) **new kind**(s) of «***monads***» -- to yet ***new ontology***. The **new** «***monads***» often *arise* via an «***aufheben***» *process* of the ‘***self-meta-«monad»-ization***’ of the ***old*** «***monads***», i.e., by *their* ‘***self-hybridization self-conversion***’. The *original connotations* of the *term* “***resonance***” *involve* situations in which an **e**xternal driving **f**requency, $\mathbf{f_e(t)}$, operating upon an oscillator, *evolves*, as of a certain ***finite*** value of the **t**ime “independent” variable, $\mathbf{t = t_*}$, to ***equal*** the [***also evolving?***] **i**nternal, **i**mmanent, “**natural**” **f**requency of that oscillator, $\mathbf{f_i(t)}$, involving a factor of the form $\mathbf{1/(\ f_i(t) - f_e(t)\ )}$, resulting, at $\mathbf{t = t_*}$, in a value, for that factor, of $\mathbf{1/(\ f_i(t_*) - f_e(t_*)\ ) = 1/(f_i(t_*) - f_i(t_*)\ ) = 1/0}$, **&** in a *suddenly escalating*, *critically crescendoing*, supposedly “**infinite**”, but actually always ***finite***, *surge* in the amplitude of the oscillation, a ‘***metafinite*** ***change*** given the *local* ***new***, also ***finite*** [in terms of the empirically-valid values of its ***quantifiers*** or ***quantitative descriptors***] ***ontology irruption***, **&/**or a *local* ***old ontology*** ‘***de-manifestation***’, that manifest(s) ***at*** **&** ***after*** $\mathbf{t = t_*}$. “***Infinite***” ***quantitative change*** may be the ***only*** proxy for ***qualitative***, ***ontological***, ‘***metafinite*** ***change*** that a “***purely***” ***quantitative language*** of ***mathematics*** can provide. Denominator-resident ***differences*** of ***dynamical functions***, which admit of a ***moment***, $\mathbf{t_*}$, at which the values of those ***two***, “***differenced***” ***dynamical functions*** equalize, are also *typical* for this more ***general concept*** of ‘***metafinite resonance singularity***’, **&**, in the ‘***re-qualified***’ versions of such ***dynamical equations***, yield the state ●, *signifying irrupting* ***new*** **&/**or vanishing ***old ontology***.

Example: ‘***self-conversion***’ of the **atoms** of the *original* interstellar ‘**atomic clouds**’ into the first “**molecular clouds**”, right ***at/after*** the crossing of a *critical threshold* of **free atoms**’ stellar ***self-reproduction/population self-growth/density self-growth/physical-spatial concentration self-growth/self-cooling***.

[*Thus precipitating a ‘***subject/verb/object identical***’ state of ‘***ontological criticality***’, ***generically described***, in the Seldonian ***first dialectical ideography***, by $\mathbf{x \rightarrow xx = x + \Delta x}$].

Definition: ‘*metafinite depletion singularity*’.

‘*metafinite depletion singularity*’ ≡ The *kind* of ‘*ontodynamical*’ *singularity* that *arises*, in the course of the “*purely*” *quantitative expanded self-reproduction* of a *local* “**population**”, or *local* «*arithmos*», of «*monads*», i.e., of the ‘*ontological units*’, or *units of ontology*, *represented* by that «*arithmos*», as *local* instantiation of a given ‘*ontological category*’, where that *local* ‘‘‘**population**’’’ is in ‘*earlier-other environ-ment*’, ‘*earlier-other surround-ment*’, or ‘*earlier-other envelopment*’ in the subject locus, **&** in which the «*monads*» in question are in the *process* of ‘‘‘catalyzing’’’ **&** ‘‘‘conducting’’’ the *conversion* of *their predecessor* «*monads*’» ‘*onto-mass*’ into *their own* ‘*onto-mass*’ – i.e., into *themselves* -- at the *moment* in time when that *ontological conversion* becomes *locally* ‘‘‘complete’’’, i.e., in which the *locally*-accessible ‘‘‘**population**’’’, or «*arithmos*», of *their predecessor* «*monads*» has become ‘‘‘completely converted’’’, i.e., ‘*completely DEPLETED*’. Such ‘*moment* of *complete depletion*’ *singularities* are associated, in the ‘*quantifiers*’ of *dynamical models* *describing* this ‘allo-conversion/-*depletion*’ *dynamic*, often formulated as ‘*quantifier-only*’ *dynamical* *equations* – with *factors* of the form $\mathbf{1/(\ M_0 - r(t)\ )}$, wherein $\mathbf{M_0 = M(0)}$ represents the *quantifier* of a *store* of ‘*onto-Mass*’, maximally extant at $\mathbf{t = 0}$, that is cumulatively drawn down by the ‘*ontology conversion*’ *process*, as *quantified* by $\mathbf{r(t)}$. Such factors result, at some *finite* value, $\mathbf{t = t_*}$, in a value, for that factor, of $\mathbf{1/(\ M_0 - r(t_*)\ ) = 1/(M_0 - M_0) = 1/0}$, resulting in an “*infinite singularity*”, an “*infinite*” state-value, for “*purely*” *quantitative* such *equations*, **&** associated with a relatively sudden, “explosive”, but always actually [*meta*]*finite irruption* of *new ontology*, perhaps accompanied by a *local* ‘de-manifestation’ of *some* or *all* elements of the pre-existing, *old ontology*, in the *actual* phenomenologies that are being *modeled* by such *equations*. In ‘*re-qualified*’ versions of such *dynamical equations*, this “*singularity*” state is represented by the value ⬮, *signifying* the *local* *irruption* of *new*, **&/**or the *local* vanishing of *old*, *ontology*. **Example**: The *moment* of *complete depletion/*‘*hetero-conversion*’ of the «*arithmos*» of **ionic Hydrogen atom** «*monads*», or of **proton** [“sub-atomic particle”] «*monads*», *local* to the stellar plasma cores of the **original generation** of stars, by nuclear fusion as “*stellar* **nucleosynthesis**”, leaving essentially only an «*arithmos*» of **Helium ion** «*monads*» in those stellar cores, resulting in a sudden resumption of the “self-gravitational” ‘self-implosion’ of such a star, until the resulting self-compression **&** ‘self-densification’ of the star achieves a stellar core **Helium density** sufficient to induce a ‘counter-self-explosion’ self-*re*-expansion of the star due to an explosion-into-*local*-existence of core fusion of **Helium nuclei**, into, e.g., **Carbon nuclei**. This *process* is *associated* with, e.g., the $\mathbf{q_{asn}}$ *term* of the $_{\mathbf{N}}\mathbf{Q}_{\_}$ *language*-formulated version of the Seldonian ‘*dialectic of Nature*’ ‘*meta-equation meta-model*’ – the *term connoting* ***not*** the ‘‘‘*original accumulation*’’’ of “atomic *species*” – i.e., “*cosmological* **nucleosynthesis**” [associated with the term $\mathbf{q_{ss} = q_a = a}$] -- but *connoting* the ‘*REproductive accumulation*’ of “atomic *species*”, i.e., “*stellar* **nucleosynthesis**”.