

The Principle of '[Almost-]Comprehensive Categorical [, Hence Monadic,] Interactivity'.

Recall, for the purposes of the examples cited in the rest of this text, the following definitions of the high-level *ontology* of *our cosmos*, to-date, and in terms of *its predicted next ontologically-revolutionary irruption* --

0. $\underset{\vee}{\mathbf{n}}^1$ -- the cosmological population of *agents* organized to *no higher* level than that of the “*non-composite*” fermions & bosons, e.g., *quarks & gluons*; $\mathbb{E} \rightarrow \mathbb{Q}_{2^0} = \mathbb{1}$; 0th ‘meta-degree’ [\mathbf{n}^{2^0}] “‘self-involution’” of the \mathbf{n} «*monads*», given ‘meta-exponent’ $\underset{\vee}{\tau}_2 = 0$;
1. $\underset{\vee}{\mathbf{s}}^1$ -- the all-cosmos population of *pre-/sub-atomic agents* organized up to the *composite* bosons & fermions level, & *no higher*, e.g., *protons & neutrons*; ‘*meta¹-n*’ *units*, each *unit* of which is made up out of a heterogeneous multiplicity of former “*non-composite*” *boson & fermion units*;
 $\mathbb{E} \rightarrow \mathbb{Q}_{2^1} = \mathbb{Q}_2$; 1st ‘meta-degree’ [\mathbf{n}^{2^1}] “‘self-involution’” of the \mathbf{n} «*monads*», *first arising* in epoch $\underset{\vee}{\tau}_2 = 1$;
2. $\underset{\vee}{\mathbf{a}}^1$ -- the cosmological population of *agents* organized up to the *atomic nuclei* level, & *no higher*, e.g., “*heavy*” *Hydrogen & Helium*;
‘*meta-s*’ *units*, each *unit* of which is made up out of a heterogeneous multiplicity of former *composite boson & fermion units*;
 $\mathbb{E} \rightarrow \mathbb{Q}_{2^2} = \mathbb{Q}_4$; 2nd ‘meta-degree’ [\mathbf{n}^{2^2}] “‘self-involution’” of the \mathbf{n} «*monads*», *first arising* in epoch $\underset{\vee}{\tau}_2 = 2$;
3. $\underset{\vee}{\mathbf{m}}^1$ -- the cosmological population of *agents* organized up to the *molecules* level, & *no higher*, e.g., *H₂, H₂O, CO₂, O₂*, etc.;
‘*meta-a*’ *units*, each *unit* of which is made up out of a heterogeneous multiplicity of former merely *atomic nuclei units*;
 $\mathbb{E} \rightarrow \mathbb{Q}_{2^3} = \mathbb{Q}_8$; 3rd ‘meta-degree’ [\mathbf{n}^{2^3}] “‘self-involution’” of the \mathbf{n} «*monads*», *first arising* in epoch $\underset{\vee}{\tau}_2 = 3$;
4. $\underset{\vee}{\mathbf{p}}^1$ -- the cosmological population of *agents* organized up to the *pre-eukaryotic cellular* level, & *no higher*, e.g., *bacteria*, etc.;
‘*meta-m*’ *units*, each *unit* of which is made up out of a *vast* heterogeneous multiplicity of former merely *molecular units*;
 $\mathbb{E} \rightarrow \mathbb{Q}_{2^4} = \mathbb{Q}_{16}$; 4th ‘meta-degree’ [\mathbf{n}^{2^4}] “‘self-involution’” of the \mathbf{n} «*monads*», *first arising* in epoch $\underset{\vee}{\tau}_2 = 4$;
5. $\underset{\vee}{\mathbf{e}}^1$ -- the cosmological population of *agents* organized up to the *eukaryotic cellular* level, & *no higher*, e.g., *yeast cells*, etc.;
‘*meta-p*’ *units*, each *unit* of which is made up out of a heterogeneous multiplicity of former *pre-eukaryotic cell units*, e.g., of mitochondria & chloroplasts, by means of cellular “*symbiogenesis*”/“*endosymbiosis*” [cf. Lynn Margulis] $\mathbb{E} \rightarrow \mathbb{Q}_{2^5} = \mathbb{Q}_{32}$;
5th ‘meta-degree’ [\mathbf{n}^{2^5}] “‘self-involution’” of the \mathbf{n} «*monads*», 1st ‘meta-degree’ [\mathbf{p}^{2^1}] “‘self-involution’” of the \mathbf{p} «*monads*», *first arising* in epoch $\underset{\vee}{\tau}_2 = 5$;
6. $\underset{\vee}{\mathbf{b}}^1$ -- the cosmological population of *agents* organized up to the *multi-eukaryotic, multi-cellular, ‘meta-biota’* level, & *no higher*, e.g., of the *asocial ‘meta-phyta’ & ‘meta-zoa’*, such as *ferns & some sharks*, respectively; ‘*meta-e*’ *units*, each *unit* of which is made up out of an, *often vast*, heterogeneous multiplicity of former *eukaryotic cell units*; $\mathbb{E} \rightarrow \mathbb{Q}_{2^6} = \mathbb{Q}_{64}$; 6th ‘meta-degree’ [\mathbf{n}^{2^6}] “‘self-involution’” of the \mathbf{n} «*monads*», 2nd ‘meta-degree’ [\mathbf{p}^{2^2}] “‘self-involution’” of the \mathbf{p} «*monads*», *first arising* in epoch $\underset{\vee}{\tau}_2 = 6$;

7. $\overset{1}{\underset{\vee}{\ell}}$ -- the cosmological population of *agents* organized up to the *proto-language-based, multi-eukaryotic-cellular, animal* [*& plant*] *societies, & no higher*, e.g., *meerkats & grain-grasses*, respectively; ‘*meta-b*’ *units*, each *unit* of which is made up out of a heterogeneous multiplicity of former *asocial* ‘*meta-biotan*’ *units*; $E \rightarrow \boxed{\ell}_2^7 = \boxed{\ell}_{128}$; 7th ‘meta-degree’ [ℓ^2] ‘‘self-involution’’ of the ℓ «*monads*», 3rd ‘meta-degree’ [ℓ^3] ‘‘self-involution’’ of the ℓ «*monads*», *first arising* in epoch $\vee\tau_2 = 7$;

8. $\overset{1}{\underset{\vee}{h}}$ -- the cosmological population of ‘*humans-led meta-societies*’ as *agents, &* organized to *no higher level*; organized, at *first*, as *language-based-humans-led, animal / plant multi-society* ‘*meta-societies*’, e.g., of *co-predatory, foraging proto-humanoid bands & pack wolves* [*proto-dogs*], *plus* ‘*horticulturalized social plant*’ foods; ‘*meta-l*’ *units*, each *unit* of which is made up out of a heterogeneous multiplicity of *animal / plant society units*, i.e., of former ‘*l-socialized meta-biotan*’ *units*, by *social* ‘‘symbiogenesis’’/‘‘endosymbiosis’’; $E \rightarrow \boxed{h}_2^8 = \boxed{h}_{256}$; 8th ‘meta-degree’ [h^2] ‘‘self-involution’’ of the h «*monads*», 4th ‘meta-degree’ [h^4] ‘‘self-involution’’ of the h «*monads*», *first arising* in epoch $\vee\tau_2 = 8$; ‘‘eucatastrophic’’ pinnacle: the *base-democratic* ‘*planetary polis*’;

9. $\overset{1}{\underset{\vee}{y}}$ -- the *predicted future* cosmological population of ‘*meta-human meta-meta-societies*’ as *agents, only extant fractionally, partially* [*‘y’*] as of the *present* time within the Terran locus & ecosphere; ‘*meta-h*’ *units*, each *unit* of which is made up out of a heterogeneous, *multi-planetary* multiplicity of former, *uni-planetary, ‘planetary polis’ units*, of ‘*humans-led meta-societies*’ *units*; ‘*meta-humanity*’; $E \rightarrow \boxed{y}_2^9 = \boxed{y}_{512}$; 9th ‘meta-degree’ [y^2] ‘‘self-involution’’ of the y «*monads*», 5th ‘meta-degree’ [y^5] ‘‘self-involution’’ of the y «*monads*», *first arising* in epoch $\vee\tau_2 = 9$.

As we have described elsewhere, our sense of the rational ‘non-arbitrariness’ of the categorial partitioning, & of the categorial ‘populationing’, of ‘The \mathbf{N}^Q *Dialectical Method*’, arises from *combinatoric principles*.

More specifically, it arises from the *principles* of ‘categorial combinatorics’, and including of [*contra-Boolean*, i.e., *consequential*] ‘categorial *self*-combinatorics’, that the \mathbf{N}^Q axioms have been designed to codify.

One of those *principles* is ‘*the principle of comprehensive interactivity*’ of ontological category-symbols.

In its mathematical symbolization, the implementation of this *principle* demands an ‘algorithmics’ in which, from the moment a ‘‘sum’’ or ‘cumulum’ of category-symbols congeals, as the ‘ontology-state’ expression for a given \underline{s} step, \mathbf{s} , or epoch, τ , every one of those category-symbols also begins to multiply itself against *itself*, & against every *other* category-symbol in that \mathbf{s} or τ ‘cumulum’.

The products of these categorial multiplications then become the ‘ontology-state’ expression for the immediately next \underline{s} step or epoch -- for \underline{s} step $\mathbf{s} + \mathbf{1}$, or for epoch $\tau + \mathbf{1}$, or, generically, for stage $\mathbf{h} + \mathbf{1}$.

Full implementation of this *principle* means that, \mathbf{N} , denoting the ‘populationing’ of *distinct* category-symbols in a dyadic Seldon Function categorial progression-‘cumulum’ ‘meta-model’ expansion, would grow as -- ${}_g\mathbf{N}_{h+1} = {}_g\mathbf{N}_h^2 + \mathbf{1}$.

The summand $\mathbf{1}$ in the equation above covers the «*arché*» category-symbol -- the *one* that constitutes the *initial*, $\mathbf{s} = \mathbf{0}$ or $\tau = \mathbf{0}$ [or $\mathbf{h} = \mathbf{0}$], ‘*non*-cumulum’, consisting of the «*arché*» category-symbol *alone*.

It also covers the “‘evolute’” inclusion of that «*arché*» category-symbol in *all* of the subsequent ‘category-symbols cumula’ of the ensuing progression, as **h** -- the [generic] stage, or **s**tep/epoch, counter -- rises, from **0**, to ever higher **W**hole-number values.

This *principle* of *comprehensive interactivity* also renders the cosmological ‘qualo-fractal tower of the self-hybrid and hybrid kinds’, as described by our ‘*dialectical “theory of everything”*’, *NON-hierarchical*.

The formula ${}_g N_{h+1} = {}_g N_h^2 + 1$ means that the *population* of *distinct* -- & *potentially*-“‘operative’” -- category-symbols, in each *next* ‘cumulum’ of category-symbols, equals the count for the immediately *preceding* ‘cumulum’, *squared*, plus **1**.

This implies, for example, that, if the **h = 0** *starting-point* has only **1** category-symbol, the «*arché*» category-symbol, then the **h = 2** ‘cumulum’ will have $1^2 + 1 = 2$ category-symbols, & that the **h = 3** ‘cumulum’ will have $2^2 + 1 = 5$ category-symbols, & that the **h = 4** ‘cumulum’ will have $5^2 + 1 = 26$ category-symbols.

The full implementation of this *principle*, in our work, comes in the form of those *g*Q *axioms-system variants*, within the Q *axioms-systems* Domain, that constitute the “*g*ödelian” variants of those *systems*/of that Domain.

In those *variants*, the subscripts of the generic *g*Q ‘meta-numerals’ utilize a kind of “‘Gödel-numbering’”.

The “‘Gödel-numbering’” product-rule encodes, into each such subscript, the “‘heritage’”, the *details* of the [auto- or allo-]*product*, or [auto- or allo-]*multiplication*, of the unique, order-specific pair of *predecessor* generic ‘meta-numerals’ by which the given ‘meta-numeral’ is produced.

This requires modifications to both the product-rule axiom, *Q9*., & to the ‘meta-Peanic’ *s*uccessor function, *s*, used in *axioms* *Q2*., *Q3*. & *Q4*., so as to convert the NQ *axioms-system* into the *g*Q *axioms-system*.

Unfortunately, this “encoding” is also, in effect, an “encryption”.

Unlike the case with the NQ *axioms-system*, where its generic ‘meta-numerals’ have *consecutive N*-number subscripts, the generic ‘meta-numerals’ of the *g*Q *system* exhibit big gaps/jumps, & even magnitude reversals, between the composite *N*-number that forms the subscript of one *g*Q generic ‘meta-numeral’, & that which forms the subscript of its immediate successor ‘meta-numeral’.

The main “‘gödelian’” *version* of the Q multiplication *axiom*, *Q9*., is --

“*g***Q9**. The *product* of any *pair* of *g*Q ‘meta-number’ *factors*, *distinct* or *not*, is equal to their *multiplicand*, *plus* that *unique g*Q ‘meta-number’ whose subscript is the *product* of the “*N*atural” *prime number* for each *factor*, such that the *prime number* for the *first* occurring factor is raised to the power of the smaller of the *two* factor subscripts, & is multiplied by the *prime number* of the *second* occurring factor, raised to the power of the larger of the *two* factor subscripts, or, indistinguishably, in either order of powers, for equal factor subscripts. By the *prime number* of a subscript, *n*, we mean the *n*th *prime number* of the “*N*atural” *numbers* [i.e., $p(1) = 2, p(2) = 3, p(3) = 5, p(4) = 7, \& p(5) = 11, \dots$].

$$[\text{or: } \forall j, k \in \mathbf{N} \mid [j \leq k] [\boxed{j} \otimes \boxed{k} = \boxed{k} \boxplus \boxed{p^{(j)} \times p^{(k)}}], \text{ versus --}$$

This exacerbates the '*homeomorphic defect*' of "'Type β .'" for the resulting 'meta-models'.

[Regarding '*homeomorphic defect*' of '*categorical-dialectical meta-models*', see --

<http://point-of-departure.org/Point-Of-Departure/ClarificationsArchive/HomeomorphicDefect/HomeomorphicDefect.htm>].

For all of these reasons, although we have sometimes mentioned the g_Q *axioms-systems variants* in our 'priming' publications [e.g., see p. **A-47**, in --

http://www.dialectics.org/dialectics/Primer_files/3_F.E.D.%20Intro.%20Letter,%20Supplement%20A-1_OCR.pdf]

-- we have *not* yet publicly narrated any 'meta-models' built using any of the 'gödelian' *variants* of the Q .

The great virtue of the g_Q *axioms-system* is that it is *deeply non-commutative*.

That is, a category-symbol such as g_{hp} is *qualitatively*, ontologically *unequal* to the category-symbol with the subscripts reversed, g_{ph} , even generically --

$$g_{hp} \neq g_{ph}, \quad \& \quad g_h \otimes g_p = g_p \otimes g_h \quad \neq \quad g_p \otimes g_h = g_h \otimes g_p$$

-- $\&$ the undergirding generic 'meta-numerals' for g_{hp} & g_{ph} have *very different composite* "**N**atural" *number* subscripts.

Contrary-wise, under the N_Q *axioms*, e.g., in our "theory of everything" 'meta-model' --

$$(N_{hp}) = \lfloor_{256+16} = (N_{ph}) = \lfloor_{16+256} = \lfloor_{272}$$

-- i.e., using '()' as an operator, or function, to map any given **D**omain-interpreted/**D**omain-solved N_Q 'meta-number' category-symbol back to its undergirding generic N_Q 'meta-numeral'.

However, connotationally-speaking, our interpreted, or "'solved-for'", meaning of N_{hp} is still *qualitatively*,

i.e., *ontologically different* from that for N_{ph} : $N_{hp} \neq N_{ph}$.

In this example, we *solve* ' N_{ph} ' as a *symbol* for the *subsumption, appropriation, or conversion* of [*part of*] a *human society's 'onto-mass'* -- including [*part of*] the '*onto-mass*' of *individual human bodies* -- into '*pre-eukaryotic cellular 'onto-mass'*'.

Such occurs when a pandemic *bacterial disease* sweeps through a *human community*, with the pandemic *bacteria* literally "eating" *portions* of *human-bodily tissue(s)*, even to the point of inducing the *deaths* of those *bodies*, so that the pandemic-*disease bacteria population*, at least temporarily, *expands its 'onto-mass'* at the *expense* of *human-social 'onto-mass'*, by converting *human 'onto-mass'* into *bacterial cell 'onto-mass'*.

We *solve* ' \mathbb{N}_{hp} ', on the *contrary*, as a *symbol* for the *subsumption*, by *human society*, of '*pre-eukaryotic cellular 'onto-mass'*' into *human society 'onto-mass'* -- e.g., the *endo-symbiosis* of *gut bacteria* in the *human body's* "micro-biome".

Thus, in cases like \mathbb{N}_{hp} \leftrightarrow \mathbb{N}_{ph} , we have an '*interpretational intra-duality*' for/within a category-symbol that maps back to a single subscript, of a single 'meta-numeral', in the undergirding generic arithmetic, when we use the \mathbb{N}_Q *axioms-system*.

The same single undergirding generic 'meta-numeral', in this case, \mathbb{N}_{272} , is pressed into the service of two ontologically, *qualitatively distinct* -- indeed, *contrary* -- *meanings*.

In our 'meta-model' narrations published to-date, we have tended to emphasize, e.g., the \mathbb{N}_{yx} meanings, & thus to de-emphasize, e.g., the \mathbb{N}_{xy} meanings, of our meta-models' category-symbols, i.e., to stress the meanings of category-symbol variants in which the larger generic **N**-value subscript epithet precedes the smaller, e.g., in this example, stressing \mathbb{N}_{hp} over \mathbb{N}_{ph} .

Thus, the emphasis on 'ontologically-retrograde conversions', or 'back-conversions', in our narrations of \mathbb{N}_Q 'meta-models' has tended to be somewhat muted vis-à-vis what it might tend to be in the narration of a \mathbb{g}_Q 'meta-model'.

We very well may, in future research, find **D**omains whose \mathbb{Q} 'meta-models' are less '*homeomorphically-defectious*', when using a \mathbb{g}_Q language *variant*, than when using *others*, in which case we may publish narrations of \mathbb{g}_Q 'meta-models' for the first time.

For \mathbb{N}_Q -language-based 'dyadic Seldon Function meta-models', we have limited the 'categorical combinatorics', *not only* by means of the \mathbb{N}_Q axioms, versus the \mathbb{g}_Q axioms, but also via certain '*canons of interpretation*'.

The *do not* latter apply, as the *axioms* do, to the undergirding, *generic* \mathbb{N}_Q , vs. \mathbb{g}_Q , 'meta-numerals' arithmetics.

They apply only to *specifically-solved* category-symbols [that are, nonetheless, still undergirded by those *generic* 'meta-numerals'], i.e., for category-symbols that have also been *applied/interpreted/solved* for a given, *specific* **D**omain, **D**.

These thus '*non-axiomatic*' "'*rules of interpretation*'", e.g., call for replacement of any multiple occurrences of subscript-epithets, by the single subscript-epithet that is the user's solution for that, e.g., double-occurrence, of the doubly-occurring subscript-epithet.

For example, in the '*dialectical "theory of everything", dialectic of Nature meta-model*', when the algebraic-unknown category-symbol \mathbb{N}_{snn} arises in the computation of the epoch $\sqrt{\tau_2} = 3$ 'cumulum', *we* replace that category-symbol with \mathbb{N}_{ss} , which we then further replace with \mathbb{N}_a . *We* do so because *our* solution for \mathbb{N}_{nn} is ' $\mathbb{N}_{nn} \vdash \equiv \mathbb{N}_s$ ', & for \mathbb{N}_{ss} , is ' $\mathbb{N}_{ss} \vdash \equiv \mathbb{N}_a$ '.

The *generic* 'meta-numeral(s)' for \mathbb{N}_{snn} , \mathbb{N}_{ss} , & \mathbb{N}_a is(are) all the same: \mathbb{N}_4 .

We have constructed the \underline{N}^Q *axioms-system*, & its ‘*canons of interpretation*’, for its *Domain-specific applications* to ‘meta-modeling’ such *Domains*, so that the following ‘meta-equations’ pertain [with $\underline{n}^u \mathbb{H}_{\underline{D}S_2}$

& $\underline{n}^u \mathbb{K}_{\underline{D}\tau_2}$ as the ‘*cumulum*’ *ideograms* for a sum of $2^{\underline{D}S_2}$ & $2^{\underline{D}\tau_2}$ category-symbol terms, for the

synchronic & *diachronic contexts* of *dialectics*, respectively, *both* for *Domain D*, within *universe of discourse u*, & within *E.D. Universal Taxonomy Level n*] --

for *synchronic* ‘dyadic *Domain meta-models*’ --

$$\underline{n}^u \mathbb{H}_{\underline{D}S_2+1} = \underline{n}^u \mathbb{H}_{\underline{D}S_2} \otimes \underline{n}^u \mathbb{H}_{\underline{D}S_2} = \text{---} + \underline{n}^u \mathbb{H}_{\underline{D}S_2} \otimes \underline{n}^u \mathbb{H}_{\underline{D}S_2}$$

-- and for *diachronic* ‘dyadic *Domain meta-models*’ --

$$\underline{n}^u \mathbb{K}_{\underline{D}\tau_2+1} = \underline{n}^u \mathbb{K}_{\underline{D}\tau_2} \diamond \underline{n}^u \mathbb{K}_{\underline{D}\tau_2} = \text{---} + \underline{n}^u \mathbb{K}_{\underline{D}\tau_2} \diamond \underline{n}^u \mathbb{K}_{\underline{D}\tau_2}$$

-- wherein the symbol ‘---’ denotes the operation/operator defined as that which extracts, from the \underline{N}^Q ‘*cumulum*’ of category-symbols upon which it operates, only the most-advanced, or ‘*meta-meristemal*’, category-symbol, i.e., the category-symbol for the highest degree of ‘*self-hybrid self-involution*’ -- the category-symbol whose corresponding undergirding generic ‘*meta-numeral*’ has the subscript of the largest *N*-value so far extant -- i.e., extant in *step number* $\underline{D}S_2$, or in *epoch number* $\underline{D}\tau_2$, respectively.

The foregoing defines the limited ‘*categorial combinatorics*’ that the \underline{N}^Q *axioms*, and the \underline{N}^Q ‘*canons of interpretation*’, applied together, are designed allow.

These limits are such that the newest categorial ontological content of the *step number* $\underline{D}S_2 + 1$ ‘*cumulum*’, or of the *epoch number* $\underline{D}\tau_2 + 1$ ‘*cumulum*’, is that which results from inter-multiplication & self-multiplication of every category-symbol in the $\underline{D}S_2$ or $\underline{D}\tau_2$ ‘*cumulum*’.

That is, equivalently, this newest categorial content results from the “‘*real* *subsumption*’” of every other ontological-category-symbol in that $\underline{D}S_2$ or $\underline{D}\tau_2$ ‘*cumulum*’, *by* the most advanced ontological category-symbol also in that $\underline{D}S_2$ or $\underline{D}\tau_2$ ‘*cumulum*’, as well as from *self*-multiplication of that most advanced category-symbol.

For example, starting from the epoch $\sqrt{\tau_2} = 2$ ‘*cumulum*’ of *our* ‘*dialectic of Nature meta-model*’, the calculation of *its, next*, resulting, $\sqrt{\tau_2} = 3$ ‘*cumulum*’, runs as follows --

$$\langle \mathbb{H}_{\underline{n}} \mathbb{H}_{\underline{s}} \mathbb{H}_{\underline{sn}} \mathbb{H}_{\underline{a}} \rangle^1 \rightarrow \langle \mathbb{H}_{\underline{n}} \mathbb{H}_{\underline{s}} \mathbb{H}_{\underline{sn}} \mathbb{H}_{\underline{a}} \rangle^2 =$$

$$\langle \mathbb{H}_{\underline{n}} \mathbb{H}_{\underline{s}} \mathbb{H}_{\underline{sn}} \mathbb{H}_{\underline{a}} \rangle \diamond \langle \mathbb{H}_{\underline{n}} \mathbb{H}_{\underline{s}} \mathbb{H}_{\underline{sn}} \mathbb{H}_{\underline{a}} \rangle =$$

